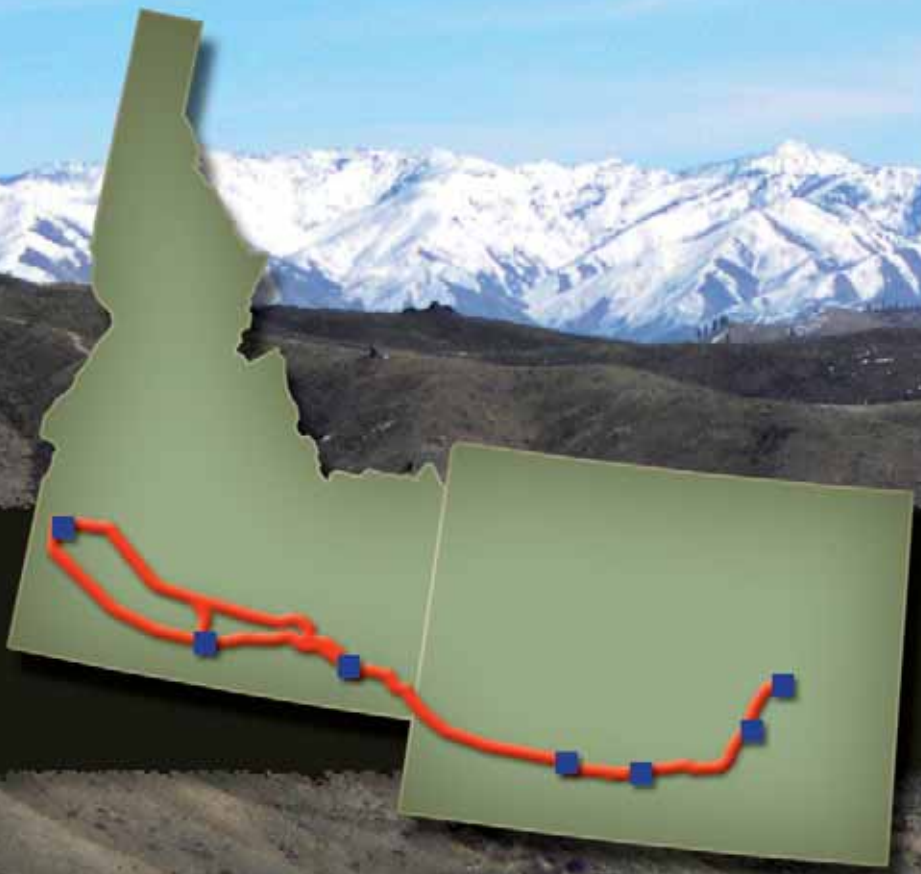
Plan of Development

May 2012



Gateway West
Transmission Line Project

Prepared By:

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A DIVISION OF PACIFICORP

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ACRONYMS AND ABBREVIATIONS

AC	alternating current
ACEC	Area of Critical Environmental Concern
aMW	average megawatts
BES	Bulk Electric System
BLM	U.S. Bureau of Land Management
CR	County Route
Companies	PacifiCorp and Idaho Power Company
EIS	Environmental Impact Statement
EO	Executive Order
EPM	environmental protection measure
EPP	Environmental Protection Plan
FERC	Federal Energy Regulatory Commission
Forest Service	U.S. Forest Service
Gateway West	Gateway West Transmission Line Project
GIS	geographic information system
I	Interstate
IDANG	Idaho Army National Guard
IPUC	Idaho Public Utility Commission
IRP	Integrated Resource Plan
kV	kilovolt
MP	milepost
MW	megawatt
MWh	megawatt hours
NERC	North American Electrical Reliability Corporation
NF	National Forest
OATT	Open Access Transmission Tariff
POD	Plan of Development
Project	Gateway West Transmission Line Project
ROW	right-of-way
SR	State Route
SRBOP	Morley Nelson Snake River Birds of Prey National Conservation Area
SRMA	Special Recreation Management Area
VRM	Visual Resource Management
WECC	Western Electricity Coordinating Council
WGFD	Wyoming Game and Fish Department
WSR	Wild and Scenic River
WWE	West-wide Energy

1.0 INTRODUCTION

PacifiCorp (doing business as Rocky Mountain Power) and Idaho Power Company, collectively known as the Companies, applied to the Bureau of Land Management (BLM) for a right-of-way (ROW) grant to use the National System of Public Lands for portions of the Gateway West Transmission Line Project (Gateway West or Project) on May 7, 2007. The original application was revised in October 2007, August 2008, May 2009, and January 2010 to reflect changes and refinements in their proposed Project and in response to feedback from the public regarding routing alternatives. This application was assigned the case file numbers of IDI-35849 for Idaho, WYW-174598 for Wyoming, and NVN-089270 for Nevada.

The Companies are proposing to construct and operate approximately 1,000 miles of new 230-kilovolt (kV), 345-kV, and 500-kV alternating current (AC) electric transmission system consisting of 10 segments between the Windstar Substation at Glenrock, Wyoming, and the Hemingway Substation approximately 30 miles southwest of Boise, Idaho (see Appendix A, Figure A-1). Greater detail is shown for each segment in maps found in Appendix A, Figures A-2 through A-12. The proposed transmission line is needed to supplement existing transmission lines in order to relieve operating limitations, increase capacity, and improve reliability in the existing electric transmission grid, allowing for the delivery of up to 1,500 megawatts (MW) of additional energy for the Companies' larger service areas and to other interconnected systems. The Project includes ground-disturbing activities associated with the construction of above-ground, single-circuit transmission lines involving, access roads, multi-purpose yards, fly yards, pulling sites as well as associated substations, communication sites, and electrical supply distribution lines. The Project crosses private land and public lands administered by the Bureau of Land Management (BLM), U.S. Forest Service (USFS), other federal agencies, and the states of Idaho and Wyoming.

The Plan of Development (POD) is intended to serve several purposes. It describes the project, including its purpose and need, details of its construction and operation, and lists the measures the Companies have taken to avoid, minimize, and mitigate for environmental impact. It provides the details needed to support the Companies' application to the BLM and other agencies for rights of way or easements across lands managed by those agencies. The Companies intend that the BLM and other agencies use the details supplied in this POD to support the analysis for and the development of all needed permits for the construction and operation of the Project.

The POD is organized as follows:

Section 1—Introduction and organizational structure

Section 2—Purpose and need for the project

Section 3—Details of the project description, including construction and operation procedures and protocols

Section 4—Plans that detail the Companies' commitment to avoidance, minimization, and mitigation of environmental impact and the proposed means of accomplishing this commitment.

The purpose of this version of the POD and the SF-299 (filed February 29, 2012) is to further supplement and revise information previously submitted through January 2010 and to support

the analysis and publication of the BLM's Final Environmental Impact Statement (FEIS) analysis and publication. This POD revises and supplements routes, ROW and structure configurations, construction timeframes, and environmental protection plans contained in the January 2010 POD and SF-299. These revisions reflect responses to comments on the Draft EIS and further negotiations with stakeholders along the Project alignment. It provides revisions in Section 2 to clarify the Companies' purpose and need; revises the project description in Section 3, and provides new and revised environmental protection plans in Section 4 and in the appendices to the POD.

This POD is submitted before the BLM has indicated the agency-preferred route. An additional planning-level POD may be issued to support additional contracting and permitting one the route to be permitted has been identified, and a final Construction POD (also known as a Construction, Operation, and Maintenance Plan for the Forest Service) will be issued as part of the Companies' request to the various agencies for permission to proceed to construction.

2.0 PROJECT PURPOSE AND NEED

The proposed transmission line is needed to supplement existing transmission lines in order to relieve operating limitations, increase capacity, and improve reliability in the existing electric transmission grid, allowing for the delivery of up to 1,500 megawatts (MW) of additional energy for the Companies' larger service areas and to other interconnected systems. The Project is principally necessary to serve the Companies' customers, though other markets may also be served. While the earliest phase of the Project needs to be in service by 2018, each segment has its own construction schedule. A more detailed description of the route, design, and an extended construction schedule alternative is presented in Section 3.1.

Under Federal Energy Regulatory Commission (FERC) tariff requirements, utilities must plan, design, construct, operate, and maintain an adequate electric transmission system that meets not only the customers' energy demands (measured in megawatt-hours) but also meet the customer's peak load demands (measured in megawatts). Both are important in determining the need for the project.

2.1 PacifiCorp (Rocky Mountain Power)

PacifiCorp is an electric utility that transmits electricity via a grid of transmission lines located throughout a six-state region and a distribution system that serves more than 1.7 million retail customers. Rocky Mountain Power, a business unit of PacifiCorp, delivers electricity to approximately 1 million customers in Utah, Wyoming, and Idaho. As an essential service provider, Rocky Mountain Power is required to operate under the oversight and regulatory controls of the Public Service Commission of Utah, the Wyoming Public Service Commission, and the IPUC. Pacific Power, another business unit of PacifiCorp, provides service to approximately 730,000 customers in Oregon, Washington, and California, and is subject to the regulatory oversight of the Oregon Public Utility Commission, the Washington Utilities and Transportation Commission, and the California Public Utilities Commission. Although the objectives of these multiple commissions vary somewhat, they do share a common goal of ensuring utilities such as Rocky Mountain Power provide safe, reliable, adequate, and efficient delivery of electricity.

PacifiCorp's system peak-hour load is forecast to increase from 10,450 MW in 2011 to 12,609 MW in 2020, a 2.1 percent average annual growth rate. The Company's eastern system peak is expected to continue growing faster than its western system peak, with average annual growth rates of 2.4 percent and 1.4 percent respectively, over the forecast horizon. PacifiCorp's system-wide average customer load is also forecasted to grow at a 2.1 percent annual rate from 2011 to 2020, increasing from 63,131,000 MWh in 2011 to 76,137,000 MWh in 2020. This average forecasted growth rate is moderately higher than the average growth rate experienced from 1995 to 2005 when the average increase per year was 1.6 percent. PacifiCorp's three highest state loads—Oregon, Utah and Wyoming (included in the MWh loads above)—are forecasted to grow at a rate of 1.4 percent, 2.4 percent, and 2.9 percent, respectively, through the same 2011–2020 period (PacifiCorp 2011). PacifiCorp's customer base in Wyoming is anticipated to increase by approximately 340 MW in the same timeframe. The growth rate is reflective of all customer loads.

PacifiCorp is a public utility under the jurisdiction of the FERC. PacifiCorp is obligated to expand its transmission system to provide requested firm transmission service and to construct and place in service sufficient capacity to reliably deliver resources to customers requesting service and existing customers as provided in their OATT under Sections 15.4, 28.2, and 28.3

(FERC 2008). PacifiCorp's Attachment K of the OATT also requires planning for the expansion of the system to ensure that its transmission system meets industry, regulatory, and reliability standards.

2.2 Idaho Power

Idaho Power is a wholly owned subsidiary of IDA-CORP, a holding company. Idaho Power is responsible for providing electrical service to its service area, which includes most of southern Idaho and a portion of eastern Oregon. The number of customers in Idaho Power's service area is expected to increase from around 492,000 in 2010 to over 650,000 by 2030. Firm peak-hour load (the peak hourly electricity that the system must supply when demand is at its highest) has increased from 2,052 MW in 1990 to over 3,000 MW in 2006, 2007, 2008, and 2009. In June 2008, the peak-hour load reached 3,214 MW, which was a new system peak-hour record.

Average firm load (the average annual demand from customers) has increased from 10,500,000 megawatt hours (MWh) in 1990 to 15,800,000 MWh in 2008 (excluding Astaris/FMC) (IPC 2011). While the economic downturn is expected to depress customer demand for electricity in the near term, Idaho Power forecasts that their average-system load will continue to grow at about 1.4 percent per year (29 average MW [aMW] annually) over the 20-year planning period. During the same 20-year planning period, the peak-hour load is expected to increase at 1.8 percent per year (69 MW annually) (IPC 2011).

Idaho Power is a regulated public utility under the laws of the State of Idaho whose mission is to provide reliable, responsible, fair-priced energy. Idaho Power operates under the oversight and regulatory controls of the Idaho Public Utility Commission (IPUC). Under Title 61 of the IPUC regulations, Idaho Power "shall furnish, provide and maintain such service, instrumentalities, equipment and facilities as shall promote the safety, health, comfort and convenience of its patrons, employees and the public, and shall be in all respects adequate, efficient, just and reasonable."

Idaho Power is also a public utility under the jurisdiction of the FERC. Idaho Power is obligated to expand its transmission system to provide requested firm transmission service, and to construct and place in service sufficient capacity to reliably deliver resources to network and native load customers as provided in their Open Access Transmission Tariff (OATT) under Sections 15.4 and 28.3 (FERC 2008). Idaho Power's OATT requires planning for the expansion of the transmission system in order to provide network integration transmission services that complies with regulatory reliability standards.

Idaho Power's 2011 Integrated Resource Plan (IRP) divides the 20-year planning horizon into two 10-year segments. The first 10-year period is analyzed first (2011-2020), followed by the second 10-year period (2021-2030). Idaho Power customer needs are largely met in the first 10-year period with the construction of the Boardman to Hemingway transmission line project.

For the second 10-year period, ten resource portfolios were analyzed in the IRP and some of these portfolios required Gateway West transmission capacity to deliver energy to major load centers in southern Idaho while others did not. The need for Gateway West capacity in each of these portfolios was driven by the assumed locations of the resources in each portfolio.

While the selected portfolio for the second 10-year period was marginally able to deliver energy to major load centers without additional transmission capacity across southern Idaho, many of the other portfolios analyzed did require additional transmission capacity. The selection of resources in the second 10-year period is largely an academic exercise, and is likely to change substantially every two years when the IRP is updated.

Without adequate transmission capacity across southern Idaho, the Company's ability to site future generation resources will be limited. The long lead time required to permit, design and construct high voltage transmission simply will not allow new transmission capacity to be built in conjunction with the construction schedule of a new generation resource. Therefore, Idaho Power believes it is prudent to continue to pursue additional transmission capacity across southern Idaho through the Gateway West project.

2.3 Team Constructional and Operational Responsibilities

Rocky Mountain Power and Idaho Power signed an agreement in 2007 to approach permitting the Project as a team. That teaming agreement is still in place, though RMP has taken the lead in the place of Idaho Power in the permitting effort as of <date>. Rocky Mountain Power is responsible for the construction and operation of Segments 1 through 4. Construction and operation of Segments 5 through 10 is still under discussion and has not been resolved as of the date of this POD. When this information is known, it will be provided in an update to the POD.

2.4 Federal Oversight of Transmission Planning

The Companies are subject to federal and state oversight and regulation for the planning, construction, operation, and maintenance of their energy transmission system. Under the FERC's authority, the Companies are required to conduct transmission planning necessary to reliably serve their native load customers and conduct planning for third-party transmission service requests in compliance with its FERC-approved Open Access Transmission Tariff (OATT). Procedures and processes for transmission planning for network customers and for third-party requests is documented in OATT Section III- Network Integration Transmission Service and subsections 28 through 33. Gateway West, as part of the larger Energy Gateway concept, has been developed, engineered, designed and will be constructed to reliably deliver designated network resources to network customer loads, both today and long-term.

FERC Order 890 presently provides the transmission planning requirements for public utility transmission providers nationwide, including all public utility transmission providers within WECC. Through Order 890, FERC requires that transmission providers participate in local planning processes as well as sub-regional and regional planning processes. PacifiCorp and Idaho Power both participate in the Northern Tier Transmission Group (NTTG), which is a sub-regional planning group comprised of transmission providers and customers. PacifiCorp and Idaho Power are also active in WECC regional transmission planning committees and studies.

FERC issued Order 1000 in July 2011 with the requirement that public utility transmission providers make compliance filings on most of the issues by October 2012. The following is a summary of FERC Order 1000, as stated in the Order:

> "The Federal Energy Regulatory Commission is amending the transmission planning and cost allocation requirements established in Order No. 890 to ensure that Commission-jurisdictional services are provided at just and reasonable rates and on a basis that is just and reasonable and not unduly discriminatory or preferential. With respect to transmission planning, this Final Rule: (1) requires that each public utility transmission provider participate in a regional transmission planning process that produces a regional transmission plan; (2) requires that each public utility transmission provider amend its OATT to describe procedures that provide for the consideration of transmission needs driven by public policy requirements in the local and regional transmission planning processes; (3) removes from Commission-approved tariffs and agreements a federal right of first refusal for certain new transmission facilities; and (4) improves coordination between neighboring transmission planning regions for new interregional transmission facilities.

> Also, this Final Rule requires that each public utility transmission provider must participate in a regional transmission planning process that has: (1) a regional cost allocation method for the cost of new transmission facilities selected in a regional transmission plan for purposes of cost allocation; and (2) an interregional cost allocation method for the cost of certain new transmission facilities that are located in two or more neighboring transmission planning regions and are jointly evaluated by the regions in the interregional transmission coordination procedures required by this Final Rule. Each cost allocation method must satisfy six cost allocation principles."

NTTG members are in the process of identifying and modifying the existing compliance filings to address the requirements of Order 1000; however, it is believed that transmission planning process under the Order 1000 requirements will remain largely unchanged from the Order 890 requirements within the NTTG footprint. NTTG's current planning process evaluates the reliability of the transmission system 10 years into the future. Each load serving entity provides 10 year projections for load and generation. The load and resource projections serve as the basis for analysis. The adequacy of the existing transmission system is evaluated for the future projections. The adequacy of the future transmission system is then evaluated for various seasonal demand and generation scenarios with proposed transmission improvements.

An Order 1000 modification of note, as differentiated from Order 890 requirements, is that the NTTG regional transmission plan must identify transmission facilities that "more efficiently or cost-effectively" meet the region's reliability, economic and Public Policy Requirements. In other words, a project's relative benefit and cost will now be analyzed as part of the transmission planning process, and the transmission plan (a single plan) will be a compilation of proposed projects that most "efficiently and cost-effectively" meet a region's needs.

The Gateway West project is one of the projects in the 2011 NTTG Biennial Transmission Plan and will most certainly be included in the 2012-2013 NTTG regional planning process. Once NTTG adopts the requirements of Order 1000, the transmission planning process will evaluate the efficiency and cost effectiveness of projects within the plan and consider any proposed alternatives that may address regional needs more efficiently or cost effectively than the projects proposed by the transmission providers in local transmission plans. It is too early to predict the Order 1000 implications on the Gateway West project with much certainty; however, Order 1000 will not undermine the previously established load service need that the project is intended to address.

FERC granted the Company incentive rate treatment, but equally important, the commission issued a 4-0 decision in which FERC stated:

> "…we find that PacifiCorp has adequately demonstrated that the Project (with the exception of segment A) will ensure reliability and reduce transmission congestion… We find that segments B through H of the Project would establish for the first time a backbone of 500 kV transmission lines in PacifiCorp's Wyoming, Idaho and Utah regions. This would provide a platform for integrating and coordinating future regional and sub-regional electric transmission projects being considered in the Pacific Northwest and the Intermountain West, connection existing and potential generation to loads in an efficient manner, thus reducing the cost of delivered power. Also, the Petition cites the 2006 DOE National Electric Transmission Congestion Study and the 2004 Rocky Mountain Area Transmission Study in stating that that proposed Project will reduce congestion or maintain reliability in the Western Interconnection. Additionally, the project would establish a direct link between PacifiCorp's east and west control areas, providing numerous benefits including increasing transfer capability, reducing the need for curtailments, and reducing transmission congestion."

WECC 10-Year Regional Transmission Plan was approved by the WECC Board of Directors September 22, 2011 and Plan Summary can be found at: (http://www.wecc.biz/library/StudyReport/Documents/Plan_Summary.pdf). Energy Gateway, including

Gateway West, is an integral part of the Foundational Transmission Project identified for the Regional Plan as shown in Section 3.2.3-Transmission. Independent stakeholders involved in data input, development and review of the plan are identified in Section 6-Organizations Involved in Development of the Plan.

2.5 State Regulation of Transmission

The state commissions involved in the review of Gateway West are Utah, Wyoming, Idaho, Oregon, California and possibly Washington. These are the states where the Companies serve retail customers. Each state has approved regulatory processes to review and determine the prudence and usefulness of any investment made on behalf of the Companies' 2.2 million customers. Although each state has slight variations in the regulatory process, essentially approval of investments occurs in the following two steps.

1. Each company files for a Certificate of Public Convenience and Necessity (CPCN) in the states physically impacted by the investment. For Gateway West, the Companies will file in Idaho and Wyoming. This process determines that an investment proposed by the Company is in the public interest and is necessary to provide safe, adequate and reliable electric service. The Companies will initiate this process when the BLM publishes the final EIS.

2. The Companies file for cost recovery of an investment through a rate case. This step occurs after the investment is made and the respective project is constructed and placed in service. This review focuses on prudence of project alternative selection, cost control, customer benefits and usefulness of the facilities resulting from the investment. Funds expended in advance of this prudency review and rate change approval by each state are 'at risk' as transmission projects are rarely "preapproved" by the states before they are initiated. There is no uniform pre-approval process for investments or for approval of project development investments in all states.

These regulatory processes change occasionally to facilitate additional and more comprehensive review by commissions and stakeholders. As an example, Rocky Mountain Power agreed in its recent 2010 Wyoming rate case settlement to provide additional justification for Gateway West and other Gateway segments through future regulatory filings in Wyoming. This will give the Wyoming commission and Wyoming customers additional information and insight into the need and benefits of these transmission investments prior to the Proponents initiating construction. PacifiCorp sees this as a positive development for the company, the commission and customers.

In support of this two-step process the Proponents engage in a series of regional activities to inform commissions and stakeholders about its projects, their purpose and need and investment requirements. The IRPs are examples of this informational process. As regulated utilities, both Idaho Power and Rocky Mountain Power are required to produce and periodically update an IRP for each state in which they operate, with the exception of Wyoming. The Public Utilities Commissions of the states where these utilities operate review and acknowledge these IRPs and their updates.

2.6 Demand Side Management

Part of the planning process that results in the IRPS and their updates includes addressing conservation and other means of reducing or controlling the growth of the demand for electricity among the utilities' customers. When the Public Utilities Commission for a given state acknowledges the IRP, it is agreeing that the balance of demand-side measures and

development of additional generation resources, including associated transmission, is appropriate to meet the needs of the customers of its state while complying with the various laws and regulations on renewable energy requirements, carbon emissions, and other energy-related issues.

The Companies have detailed their demand-side management in their respective IRPs, which have been acknowledged by the Public Utilities Commissions for which they were written (RMP 2011; IPC 2011).

2.7 Existing Transmission System Reliability Constraints

Transmission systems in the United States must be planned, operated, and maintained under the North American Electrical Reliability Corporation (NERC)[1] reliability performance standards. These mandatory national standards govern the level of performance and reliability of the Bulk Electric System (BES) operated within the United States. Additionally, the Companies are governed by the Western Electricity Coordinating Council (WECC)[2] policy procedures, criteria, and standards that may be more stringent than those required by NERC. In compliance with the above standards, transmission systems must be planned, designed, built, and continually operated with sufficient levels of redundancy to enable the transmission system to reliably operate in the event of the loss of any single element (i.e., generation unit, transmission line segment or substation equipment) or loss of multiple elements, thereby providing adequate service to Customers and to other interconnected utilities. Adding new transmission facilities to a network provides not only new transmission capacity but also levels of backup to each other during outage conditions when elements of the system are taken out of service during both planned and unplanned events.

Transmission paths consist of single lines or combinations of lines operated together as a single transmission unit to maximize capacity of the system and to maintain reliability. Path capacities are usually limited by the line in the path with the least capacity. The capacity ratings of the paths are based on maintaining established reliability criteria. The existing path capacity "bottlenecks" and how the path rating will increase with the Gateway West segments in place are shown Table 2.4-1.

[1] NERC's mission is to improve the reliability and security of the bulk power system in North America. To achieve that, NERC develops and enforces reliability standards; monitors the bulk power system; assesses future adequacy; audits owners, operators, and users for preparedness; and educates and trains industry personnel. NERC is a self-regulatory organization that relies on the diverse and collective expertise of industry participants. As the Electric Reliability Organization, NERC is subject to audit by the FERC and governmental authorities in Canada (NERC 2012).

[2] WECC and the nine other regional reliability councils were formed due to national concern regarding the reliability of the interconnected bulk power systems, the ability to operate these systems without widespread failures in electric service, and the need to foster the preservation of reliability through a formal organization. The Western Interconnection encompasses a vast area of nearly 1.8 million square miles. It is the largest and most diverse of the eight regional councils of the NERC. WECC's territory extends from Canada to Mexico. It includes the provinces of Alberta and British Columbia, the northern portion of Baja California, Mexico, and all or portions of the 14 western states in between (WECC 2011).

Table 2.4-1. Rating and Capacity of Paths with and without the Gateway West Project

Path Name [2/]	Path Rating Limit (Present Operational Maxima) (MW)	Existing Available Transmission Capacity (MW)	Proposed Gateway West Parallel Segments [1/]	Planned Rating/Capacity Increase from Gateway West (MW)	Proposed Path Rating/Capacity with Gateway West (MW)
TOT 4A (WY Northeast to WY Central)	937	0	Segments 1W Windstar-Aeolus	838	1,775
Aeolus West (WY Central to WY Southwest)	NA	NA	Segments 2 and 3, Aeolus-Anticline plus existing lines	2,670	2,670
Bridger West	2,400	0	Segment 4 Jim Bridger-Populus	1,700	4,100
Borah West	2,557	0	Segments 5, 6, and 7 Populus-Borah, Borah-Midpoint, and Populus-Cedar Hill	1,893	4,450
Midpoint West	2,287	0	Segments 8, 9 and 10 Cedar Hill-Midpoint, Midpoint-Hemingway and Cedar Hill-Hemingway	2,113	4,400

1/ Refer to Figure A-1 for segments and substations.
2/ Each of the paths listed in Table 2.4-1 is part of the Gateway West Project and is dependent on the others to move power from east to west (Wyoming to Idaho).

In siting new transmission facilities, the Companies are obliged to be prudent and site and install facilities to avoid a potential "common mode failures" where system element failures or outages can impact other elements during a single outage event (lines adjacent to each other on a common transmission tower or two parallel transmission lines in close proximity to each other). Common mode failures include, but are not limited to, a snagged lighting protection shield wire from one line being dragged into the adjacent line, an aircraft flying into more than one line, smoke from a fire across the ROW shorting out more than one line, lightning strikes affecting more than one line, high winds, dust storms, ice storms, blizzards, landslides, earthquakes, vandalism, and equipment failure. As a minimum requirement, NERC/WECC reliability performance standards require that a multiple contingency analysis (an analysis of the simultaneous failure of two adjacent lines) must be performed to evaluate the BES impact resulting from the loss of multiple transmission lines to the remaining transmission system. For the Gateway West analysis, the electrical power flowing on the two transmission lines, once removed from service, must now flow across the remaining transmission system in the area and subsequently overloads portions of the remaining system or the electric system enters an unstable operating state and shuts down. The useable system capacity limit is consequently reduced to protect the remaining system from this overload or unstable operating condition. When transmission lines are separated from each other, common mode failures pose a significantly reduced risk and the NERC/WECC reliability standards only requires evaluation of one line out of service at a time. Constructing transmission lines physically separated from each other allows the Companies to operate their interconnected electric system at a higher electrical capacity than would otherwise be possible. The net result of line separation is that fewer transmission lines are needed overall to adequately serve Customers' energy needs.

Due to the high transfer capacity requirements necessary for the Gateway West Project, high-capacity lines must be located on separate corridors to increase reliability and to provide the highest capacity possible.

The WECC Board of Directors approved a regional transmission planning criterion (TPL [001-004]-WECC-1-CR), on April 18, 2008. This planning criterion specifies that utilities must plan for two lines to be out of service at the same time if they are located adjacent to each other unless those lines are separated by at least "the longest span length of the two transmission circuits at the point of separation or 500 feet, whichever is greater, between the transmission circuits" (WECC 2008). This criterion has subsequently been revised, but the initial siting study for Gateway West was based on this criterion.

In that study, the longest span was assumed to be 1,500 feet, thereby dictating the minimum distance between existing and proposed transmission lines. In the final design, the separation distance could increase where existing line spans are determined to be greater than 1,500 feet thereby requiring Gateway West to be located the maximum span distance away when adjacent to longer spans. This criterion in itself does not guarantee transmission system reliability or future system performance. Utilities are expected to use their history of experience and prudent judgment in planning, siting, and designing transmission systems to ensure the reliability of the interconnected grid. Utilities can and do elect to provide wider separation or select an alternate transmission line route to reduce the risk of multiple line outages along common routes used by high-capacity lines.

The recent WECC revision of this criterion affects only one of many criteria that need to be considered when planning transmission projects. Specifically, WECC has relaxed its definition of a common corridor from the greatest span or 500' from an existing line to a minimum of 250' from an existing line. The remaining criteria still obligate a transmission provider to take into consideration the potential impacts to reliability. For Gateway West, the originally planned minimum separation is still needed when taking into consideration potential impacts to reliability of siting the proposed project closer than the span distance of that adjacency. The Companies' approach remains the same, and consistent with others, who have stated that 'by far the most cost effective preemptive strategy against multiple simultaneous line loss involves ensuring adequate distance separation between lines at the planning stage' (West Wide Energy Corridor EIS, ANL 2008).

Even though the WECC separation criterion has been revised, the WECC/NERC requirements to provide reliable electricity have remained the same. Acts of nature such as fires or micro bursts or other acts such as vandalism or required fire suppression management may impact the reliability of the bulk transmission system if lines are sited in close proximity. Common corridor outages, in particular outages caused by smoke and fire, are prevalent through the open areas of Wyoming and Idaho. During the drier parts of the year, fires can ignite and move extremely fast. When heavy smoke rises to the level of the conductors, the air between the conductors loses some of its insulation properties, and the conductor will begin to conduct electricity to ground, or "fault"; protective instrumentation will disconnect the transmission line from the electrical system. If Gateway West transmission lines are constructed close to other transmission lines and the two lines disconnect in rapid succession, major problems may result for the electrical grid, potentially leading to wide-spread outages (area blackouts).

The Proponents have provided the BLM information of numerous occurrences of fire, wind, geological and other related corridor outages. If a major event did occur, preparation for a future similar outage would likely be mandated. The first step toward preparing for a similar occurrence would be to reduce the rating and capacity of the facilities, resulting in a project that

is vastly inferior to the purpose and need. For example, following the WECC west wide disturbance in 1996 PacifiCorp was required to make a significant reduction in transmission system capacity ratings on its WECC rated Path C between southeast Idaho and northern Utah. A significant system capacity reduction, from 1,000 MW to 600 MW, was a direct result of the disturbance investigation by WECC, to reduce the stress on the system and gain more reliability. As a result PacifiCorp constructed the Populus to Terminal transmission line to restore reliability. The project sponsors believe the first step to avoid a common corridor outage is to locate the lines as far apart as feasibly possible, without creating additional undue impact to the environment and surrounding areas. Forcing the Gateway West project into close proximity to other lines undermines the overall purpose and need of the project.

If BLM were to consider an alternative for Gateway West that studied the consequences of siting the proposed Gateway West only 250 feet from existing transmission in one or more corridors along the proposed Project route, the Companies could not build that alternative because it would not meet minimum standards for reliability. The Companies received WECC approval to carry the proposed load found in the Purpose and Need for the Project based on the average separation distance, among several other factors, for the proposed Gateway West alignment.

There were several instances where outages on systems operated by the Companies and others have led to serious consequences. In 2007, a fire burned through the Jim Bridger transmission line ROW resulting in an outage of all three 345-kV lines and three of the four Jim Bridger generating units (Gerrard 2010). Also in 2007, a fire caused the Mona – Huntington and Mona – Bonanza 345-kV lines in Central Utah to de-energize (Gerrard 2010). In California, two adjacent 500-kV line towers failed in 2005, leaving an estimated 5.2 million customers in California, Nevada, Oregon, and Texas without power (California ISO Corporation 2005).

To further ensure reliability requirements are met, the Companies have proposed that a permanent service road to each transmission structure be retained (see Appendix B, Section 1.5, for further detail) to control vegetation in the ROW for safe operation and for periodic inspections and maintenance (IPC and RMP 2011).

2.8 Purpose of the Gateway West Project

This Project is designed to provide for the delivery of up to 1,500 MW to the service areas of the Companies and possibly other markets. From Windstar to Populus, Gateway West will deliver up to 1,500 MW of primarily wind energy for transmission to markets south and west of Populus, including the Wasatch Front.

Idaho Power forecasts a peak-hour load growth of 69 MW per year over the next 10 years. PacifiCorp forecasts the megawatt-hour growth between 2010 and 2019 for Utah, Wyoming, and Oregon will be 6.8 million, 3.7 million, and 1.1 million megawatt-hours, respectively. These forecasts are based on the IRPs prepared by each company as required to fulfill the regulatory requirements and guidelines established by the public utilities commissions of the states served by the Companies (PacifiCorp 2011; IPC 2011). Each IRP addresses the obligations of each company pursuant to its OATT to plan for and expand its respective transmission systems in a non-discriminatory manner based on the needs of its native load customers, network customers, and all eligible customers that agree to expand their transmission systems. This includes entities that generate or plan to generate electricity, including coal-fired, natural-gas-fired, and renewable energy sources (biogas, wind, and geothermal). As of June 2011, all of the generators requesting transportation on Gateway West were wind energy (PacifiCorp 2011).

Gateway West is independent of, and will be built regardless of, any particular new generation project. The transmission grid of which it will become a part can be thought of in terms of hub and spokes, with a backbone connecting to the hubs. Each substation is a hub and receives or sends electricity along the spokes. For this system to work, a backbone of high-capacity transmission lines is needed to connect the hubs and transport the electricity from where it is or can be generated (in this case, mostly Wyoming but also Idaho), to where it is needed (in this case, mostly Idaho and Utah, though other markets may also be served).

2.8.1 Gateway West Substation Purposes

This Project proposes to connect 12 substations, which are essential control points for the route. These are illustrated in Appendix A, Figure A-1, and in subsequent maps by segment. The purposes of the individual substations to support the need for the overall location of the Gateway West Project are displayed in Table 2.5-1. Nine of the substations are in service now and three are proposed as part of this Project.

Table 2.5-2. Substations to Be Connected by Gateway West

Substation	Description	Purpose
Windstar	Existing: interconnection and generation-driven	The purpose of this substation is to integrate future wind and thermal resources with the existing transmission system by looping two existing 230-kV transmission lines into the substation. The Gateway West Project starts at this substation because of the recent large development of nearby energy sources needing transmission to points west, including 200 MW integrated at the Windstar 230-kV Substation, Glen Rock 1 & III – 138.5 MW, Rolling Hills – 99 MW, Three Buttes – 99 MW, and Casper Wind – 17 MW.
Dave Johnston Power Plant	Existing: interconnection and generation-driven	Work inside the existing 230kV yard will consist of rebuilding bus switches to increase capacity to match the rebuilt 1W(c). No ground-disturbing activity or expansion of the fence line will be needed.
Heward	Existing : part of Gateway West: interconnection-driven	This new substation will be constructed immediately adjacent to the Difficulty substation. Difficulty must be kept in service while Segment 1W(c) is reconstructed, requiring the additional bus construction to be conducted adjacent to the existing substation. Construction of Heward will allow PacifiCorp to control the operation of the new buses, essential for reliability of the reconstruction.
Shirley Basin	Existing: interconnection-driven	Shirley Basin is an existing interconnection point for an existing wind energy facility. 1W(c) must interconnect here during the reconstruction of the line and the communication system must be improved. However, there will be no expansion of the fence line and no ground disturbance anticipated.
Aeolus	Proposed : part of Gateway West, generation-driven	This substation is intended to serve high wind areas identified in portions of Wyoming and will be the location for interconnecting new wind-driven sourced energy. The Aeolus 230-kV substation will be integrated into the RMP transmission system by looping the Dave Johnston – Heward – Shirley Basin – Miners 230-kV line into Aeolus. Aeolus will be used to interconnect future wind generation projects.
Anticline	Proposed: part of Gateway West, generation-driven	The new transmission lines will interconnect to the existing transmission system in the vicinity of the Jim Bridger Power Plant by constructing a new substation nearby. The purpose of the proposed substation is to support the existing thermal generation hub as well as an expanded hub for new wind resources expected to be sited in the area.

Table 2.5-2. Substations to be Connected by Gateway West (continued)

Substation	Description	Purpose
Jim Bridger Power Plant 345-kV	Existing: interconnection and generation-driven	This substation will be expanded to connect the Jim Bridger Power Plant with a new transmission line. No new generation will be added at the Jim Bridger Power Plant as a result or as part of this Project.
Populus	Existing: interconnection and generation-driven	This substation will interconnect with the proposed Gateway West 500-kV transmission lines, the existing Jim Bridger West 345-kV system, and the 345-kV transmission lines running north-south. The north-south 345-kV transmission lines (not part of Gateway West) begin at the Populus Substation (near Downey, Idaho), run south to the Wasatch Front[1/], and transport new resources south to the Wasatch Front demand centers.
Borah	Existing: interconnection and load-driven	The substation expansion will allow the interconnection of new 500-kV transmission lines between Populus and Midpoint, as well as a new termination of a 345-kV line to Kinport.
Midpoint	Existing: interconnection and load-driven	The substation expansion will allow interconnection of new transmission lines from Cedar Hill and Hemingway and allow for the existing 345-kV transmission line between Borah and Midpoint Substations to be energized at 500 kV, thereby creating a continuous 500-kV system expansion and reliability tie with the Cedar Hill Substation
Cedar Hill	Proposed: part of Gateway West, load-driven	The station serves two purposes: 1) a reliability tie between the proposed Gateway West north and south transmission lines, and 2) a 500-kV to 230-kV transformation station for serving the Magic Valley load. This will complement the existing service from Midpoint to the north of the Magic Valley. The Magic Valley Electrical Plan is under development, with this station being considered as a future source to the valley.
Hemingway	Existing; interconnection and load-driven	The station expansion will serve as an interconnection point for the Gateway West, Summer Lake, Boardman, and Captain Jack transmission lines. The station itself currently serves the Treasure Valley load. The station is the southwestern 500-kV to 230-kV transformation point in the Treasure Valley 500-kV loop, as defined in the Treasure Valley Electrical Plan. The Hemingway Substation is the western terminus of the Gateway West Project because it is the major load point for the generation resources brought in from the east, primarily Wyoming.

1/ About 75 to 80 percent of all of the electricity use in the state of Utah is in the area known as the Wasatch Front. This area includes the entire electrical load served out of the Spanish Fork Substation in the south up to the electrical load served out of the Ben Lomond Substation in the north. This includes parts of Juab and Sanpete Counties, and all of Utah, Salt Lake, Summit, Tooele, Wasatch, Davis, Morgan, and Weber Counties.

2.8.2 Gateway West Transmission Line Segment Purposes

Table 2.5-2 summarizes the purpose for each of the segments of Gateway West. Each segment's Project description is presented in detail in Section 3.

Table 2.5-2. Gateway West Transmission Line Segments

Transmission Line Segment	Purpose
Segment 1W—Windstar to Aeolus, single-circuit 230-kV and Dave Johnson to Aeolus , rebuilt 230-kV line	Transport existing and new resources to load centers farther west via interconnection at Aeolus Substation. This line also represents the Companies' portion of a future 230-kV network of lines that are required to integrate other projects in areas of high wind potential.
Segment 2—Aeolus to Creston[1/], single-circuit 500-kV line	Transport new resources to load centers farther west.
Segment 3—Creston[1/] to Anticline, single-circuit 500-kV line	Transport new resources to load demand centers farther west.
Segment 3A—Anticline to Jim Bridger 345-kV	Provide for bidirectional transfer of power and integration of the Gateway West project by providing an intermediate tie line with the existing EHV system at Jim Bridger Substation.
Segment 4—Anticline to Populus, single-circuit 500-kV line	Transport new resources to load demand centers farther west and interconnect with existing systems.
Segment 5—Populus to Borah, single-circuit 500-kV line	Transport Wyoming energy resources from Populus to loads in southern Idaho and the Pacific Northwest. Additionally, this line will transport Pacific Northwest sourced energy to Populus to serve load in the Salt Lake City metropolitan area. Provides physical separation to meet reliability criteria between a northern route (Populus – Borah – Midpoint – Hemingway) and a southern route (Populus – Cedar Hill – Hemingway). Physical separation is needed due to existing transmission line congestion (multiple lines in the same area) and wildland fires resulting in outages.
Segment 6—Borah to Midpoint, energize existing 345-kV line to 500 kV	Increase the capacity of the existing line to transport existing and new energy resources in the service areas of the two Companies. Replace or reconfigure up to five spans at each end to accommodate new connections in substations to new 500-kV bays. No new transmission line construction
Segment 7—Populus to Cedar Hill, single-circuit 500-kV line	Transport existing and new energy resources to load demand centers to the west. Additionally, this line will transport existing and new Pacific Northwest energy resources to serve load demand centers to the east. Provide physical separation to meet reliability criteria between a northern route (Populus – Borah – Midpoint – Hemingway) and a southern route (Populus – Cedar Hill – Hemingway). Physical separation is needed due to existing transmission line congestion (multiple lines in the same area) and wildland fires resulting in outages.
Segment 8—Midpoint to Hemingway, single-circuit 500-kV line	Transport existing and new energy resources to load demand centers throughout the system. Provide physical separation to meet reliability criteria between a northern route (Populus – Borah – Midpoint – Hemingway) and a southern route (Populus – Cedar Hill – Hemingway). Physical separation is needed due to existing transmission line congestion (multiple lines in the same area) and wildland fires resulting in outages.
Segment 9—Cedar Hill to Hemingway, single-circuit 500-kV line	Transport energy resources to serve load demand centers throughout the system. Provide physical separation to meet reliability criteria between a northern route (Populus – Borah – Midpoint – Hemingway) and a southern route (Populus – Cedar Hill – Hemingway). Physical separation is needed due to existing transmission line congestion (multiple lines in the same area) and wildland fires resulting in outages.
Segment 10—Midpoint to Cedar Hill, single-circuit 500-kV line	Provide a midway tie between the northern and southern routes, which is required for system reliability to move flows of the north system or the south system when transporting greater than 2,500 MW of power.

[1/] Creston Substation has been deleted from the Project. The location of the Creston substation is now used as the dividing point between Segments 2 and 3. See Section 3 for details.

3.0 PROJECT DESCRIPTION

3.1 Overall Project

As proposed in this revised POD, the Gateway West Project is composed of ten segments of high-voltage transmission lines that will run between proposed or existing substations. These segments start at the existing Windstar Substation close to the Dave Johnston Power Plant near Glenrock, Wyoming, and continue west until reaching the existing Hemingway Substation approximately 30 miles southwest of Boise, Idaho. An overview map of the Project location and facilities is provided in Appendix A, Figure A-1. Figure A-1 shows the Proposed Route (red). Maps of each segment are shown on Figures A-2 through A-12 in Appendix A. Maps of each existing or proposed substation are provided in Appendix A as Figures A-13 through A-24.

Changes since Draft Environmental Impact Statement (EIS) and January 2010 POD

The major facility design changes from the Project described in the Draft Environmental Impact Statement (EIS) and January 2010 POD are:

- **Elimination of Segment 1E** – Elimination of the proposed single-circuit 230-kV line that would have been constructed between Windstar and Aeolus along Segment 1E. Segment 1E is no longer part of the Project because of lack of timely development of previously announced and planned wind resources within the project timeframe. As now proposed, Segment 1 will be a new 230-kV line between the Windstar and Aeolus substations (Segment 1W(a)) and a reconstruction of an existing 230-kV line between Dave Johnston Power Plant and Aeolus Substation (Segment 1W(c)). Elimination of Segment 1E results in the elimination of some equipment in the Windstar and Aeolus substations.
- **Elimination of one of the Segment 2, 3, and 4 electrical circuits** – Adoption of one single-circuit 500-kV transmission line for Segments 2, 3, and 4. This alternative is described in the Draft EIS as the first phase of the Schedule Variation and therefore is fully evaluated in that document. The difference between the Schedule Variation and the Project as described herein is that the second phase will not be built. Elimination of the second circuit between Aeolus and Populous Substations eliminates the need for the Creston and Bridger 230-kV Substations and some equipment in the Aeolus and Anticline Substations. .
- **Elimination of Creston Substation** – The demand for oil and gas field electrical energy has not materialized. The Creston Substation is no longer needed and therefore was eliminated. However, the location continues to be used as the terminus for Segments 2 and 3, whose routing was determined by the WWEC and by the Wyoming Governor's EO-2011-5.
- **Proposed Route changes** – Since the January 2010 POD, engineering has progressed on portions of the Proposed Route. A design centerline has been developed for portions of the Proposed Route Segments 1W(a), 1W(c), 2, 3, 4, and portions of 7. These micro-siting changes range from less than 100 feet up to several miles. The changes are due to more site-specific information, refined design criteria for structure placement and conductor spans, and compliance with clearance and set-back codes for mine operations, railroads, and highways. Other changes are due to continued consultation with landowners. Finally, the Companies have adopted Alternative 2C and Alternative 4A as their Proposed Routes based on public comment during the Draft EIS review process.

- **Variation changes** – The Schedule Variation and Design Variation alternatives are no longer part of the Project. However, the Structure Variation remains.

To maintain the segment numbering system and naming convention with the elimination of the Creston Substation, the location of the termination of Segment 2 and the beginning of Segment 3 is now simply called "Creston."

The following Project description incorporates the changes described above.

3.1.1 Proposed Project

The Project starts in Wyoming at the Windstar Substation and Dave Johnston Power Plant. Segment 1W(a) for the most part follows or parallels the West-wide Energy (WWE) corridor and an existing 230-kV line. This 230-kV line is the proposed route for reconstruction as Segment 1W(c). Both lines will terminate at the proposed Aeolus Substation. The Project then proceeds as one single-circuit 500-kV line from Aeolus to Populus Substation though Segments 2, 3, and 4. The interconnection from Anticline to its neighboring existing substation at the Jim Bridger Power Plant, Segment 3A, is 5.5 miles of 345-kV single-circuit line. At Populus, the Gateway West Project splits into two single-circuit 500-kV roughly parallel paths. Segments 5, 6, and 8 Follow a more northerly route toward the Hemingway Substation through the Borah and Midpoint Substations, while Segments 7 and 9 travel a more southerly route through the Cedar Hill Substation to Hemingway. Segment 10 provides an interconnection between the Cedar Hill and Midpoint Substations and also provides an interconnection between the more northerly and more southerly routes. The Companies have proposed this split because of the need to serve loads along the way and also to increase reliability.

The transmission line segments will cross federal, state, and private lands. Table 3.1-1 summarizes miles crossed by ownership for the Proposed Route. The total length of all segments requiring new transmission line construction is approximately 1,000 miles. The ROW width requested for the transmission line is 125 feet for single-circuit 230-kV segments, 150 feet for the 345-kV segment, and 250 feet for single-circuit 500-kV segments.

Table 3.1-1. Proposed Project Summary of Miles and Percent Crossed by Ownership

Segment	Length (Miles)						Percent of Total				
	BLM	NF[1/]	State	Private	Other [2]	Total	BLM	NF	State	Private	Other
Segment 1W(a) – Windstar to Aeolus	27.0	2.3	17.5	27.0	0.1	**73.8**	36.6	3.1	23.6	36.5	0.1
Segment 1W(c) – Dave Johnston to Aeolus	24.7	2.3	16.1	30.4	.1	**73.6**	33.6	3.2	21.8	41.3	0.1
Segment 2 – Aeolus to Creston	37.6	–	4.7	49.5	0.1	**91.9**	41.0	–	5.1	53.9	0.1
Segment 3 – Creston to Anticline	22.5	–	1.0	22.5	–	**45.9**	48.9	–	2.2	48.9	–
Segment 3A—Anticline to Jim Bridger 345-kV	3.2			1.9		**5.1**	63.0			37.0	
Segment 4 – Anticline to Populus	72.0	9.1	12.5	100.7	3.3	**197.6**	36.4	4.6	6.3	500.9	1.7
Segment 5 – Populus to Borah	13.2	–	3.6	38.9	0.1	**55.7**	23.7	–	6.5	69.8	.1
Segment 6 – Borah to Midpoint[3/]	–	–		0.5	–	**0.5**		–		100.0	–
Segment 7 – Populus to Cedar Hill	28.3	–	4.3	85.6	–	**118.2**	24.0	–	3.6	72.4	–
Segment 8 – Midpoint to Hemingway	87.1	–	9.3	31.5	3.6	**131.5**	66.2	–	7.1	24.0	2.7
Segment 9 – Cedar Hill to Hemingway	129.2	–	4.6	28.4	–	**162.2**	79.7	–	2.8	17.5	–
Segment 10 – Midpoint to Cedar Hill	16.2	–	–	18.0	0.1	**34.4**	47.2	–	–	52.5	0.3
Total Project[4/]	**461.1**	**13.7**	**73.4**	**434.9**	**7.3**	**990.5**	**46.6**	**1.4**	**7.3**	**43.9**	**0.7**

1/ Totals reflect mileage crossed on National Forest System (NFS) land.
2/ Other includes Bureau of Reclamation, U.S. Fish and Wildlife Service, etc.
3/ Segment 6 does not include ground-disturbing activity except in association with the expanded Borah and Midpoint Substations.
4/ Totals may not equal 100 percent due to rounding.

Facilities included as part of the Project include:

- Ten transmission line segments, including their associated access roads, multi-use and helicopter fly yards, and other temporary construction ground disturbances;
- Three proposed substations and expansion or modifications at nine existing substations;
- Other associated facilities including communication systems and optical fiber regeneration stations, and
- Access roads and distribution supply lines where needed for proposed substations and optical fiber regeneration stations.

Details of construction and operations are summarized in Section 3.5 and detailed in Appendix B. Environmental protection plans are briefly summarized in Section 4.0 and included as appendices. These plans are considered part of the Project description for the proposed Project. Table 3.1-2 illustrates and summarizes the Proposed Action. Table 3.1-3 shows the construction schedule for the Project.

Table 3.1-2. Summary of Project Facilities

Project Facility	Description
Transmission Line Segments	
Transmission Line Features Common to All Proposed 500-kV Segments	• Three-phase 500-kV construction for all tower designs, conductor spacing and clearances[1]. • Conductors: Bundled 1949.6 kcmil 42/7 aluminum conductor steel reinforced (ACSR)/TWD “Athabaska/TW”, with three subconductors per phase. Non-specular (dull) finish rather than a shiny finish. • Estimated subconductor diameter: 1.504 inches. • Bundle spacing: Distance between subconductors is 18 inches and 25 inches. • . • One optical ground wire (OPGW) containing 48 fibers and with diameter of 0.637 inch on one side of tower. • One extra high strength (EHS) steel overhead ground wire. • Steel overhead ground wire diameter: approximately 0.495 inch. • Minimum ground clearance: 35 feet. • Structure types: lattice steel single-circuit structures. Dulled galvanized steel finish. • Structure heights: Single-circuit structure varies between 145 and 180 feet. Average height of 156 feet. • Approximate distance between structures: 1,200 to 1,300 feet. • .ROW width for one single-circuit: 250 feet. • The exact quantity, distance between, and placement of the structures will depend on the final detailed design of the transmission line, which is influenced by the terrain, land use, environmental constraints, and economics. Alignment options may also slightly increase or decrease the quantity, location, and height of structures.

Table 3.1-2. Summary of Project Facilities (continued)

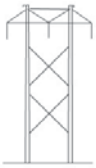
Project Facility	Description
Transmission Line Features for Segment 3A (345-kV)	• Three-phase 345-kV construction for all structure designs, conductor spacing and clearances[1]. • Conductors: Bundled 1272 kcmil 45/7 ACSR "Bittern" with three subconductors per phase. Non-specular finish. • Estimated subconductor diameter: 1.345 inches. • Bundle spacing: 18 inches and 25 inches. • One optical ground wire (OPGW) containing 48 wires and with diameter of 0.637 inch where communications is required • One EHS steel overhead ground wire. • Estimated shield wire diameter: approx. 0.495 inch. • Minimum ground clearance: 30 feet. • Structure types: steel H-frame structures. • Above-ground structure heights: varies between 80 and 110 feet. • Approximate distance between structures: 800 feet. • ROW width: 150 feet. • The exact quantity, distance between and placement of the structures will depend on the final detailed design of the transmission line, which is influenced by the terrain, land use, environmental constraints, and economics. Alignment options may also slightly increase or decrease the quantity, location, and height of structures.
Transmission Line Features Common to All Proposed 230-kV Segments	• Three-phase 230-kV construction for all structure designs, conductor spacing and clearances[1]. • Non-specular finish applied to conductors. • Bundle spacing: 18 inches vertical with two subconductors per phase. • One optical ground wire (OPGW) containing 48 fibers and with diameter of 0.637 inch where communications is required • Two EHS steel overhead ground wires where communication is not required. One EHS steel overhead ground wire where communication is required. • Estimated shield wire diameter: approx. 0.495 inch. • Minimum ground clearance: 28 feet. • Structure types: steel H-frame structures. • Above-ground structure heights: varies between 60 and 90 feet. • Approximate distance between structures: 800 feet. • ROW width: 125 feet. • The exact quantity, distance between and placement of the structures will depend on the final detailed design of the transmission line, which is influenced by the terrain, land use, environmental constraints, and economics. Alignment options may also slightly increase or decrease the quantity, location, and height of structures.
Segment 1W(a) – Windstar to Aeolus 	• Single-circuit 230-kV transmission line in one ROW. • Single circuit H-frame steel structures. • Conductors: Bundled 1272 kcmil 45/7 ACSR "Bittern" with two subconductors per phase.. • Approximate number of structures: 588. • Line length: Approximately 76.5 miles. • One optical signal regeneration site. • See Figure A-2.

Table 3.1-2. Summary of Project Facilities (continued)

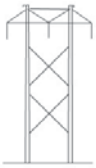
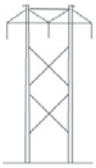
Project Facility	Description
Segment 1W(c) – Dave Johnston to Aeolus 	• Existing single-circuit 230-kV transmission line to be reconstructed with single circuit H-frame steel structures. • Conductors: Bundled 1272 kcmil 45/7 ACSR "Bittern" with two subconductors per phase between Dave Johnston Substation and Shirley Basin Substation; approximately 58.8 miles. • Conductors: Bundled 1557 kcmil 45/7 ACSS/TW "Potomac" with two subconductors per phase between Shirley Basin Substation and the proposed Aeolus Substation; approximately 13.8 miles. • Approximate number of structures to be replaced: 531. • Line length: Approximately 73.6 miles. • No optical signal regeneration sites. • See Figure A-2.
Segment 2 – Aeolus to Creston	• One single-circuit 500-kV transmission line in one ROW. • Single-circuit lattice steel structures. • Approximate number of structures: 414. • Line length: Approximately 91.9 miles. • Two optical signal regeneration sites. • See Figure A-3.
Segment 3 – Creston to Anticline	• Single-circuit 500-kV transmission line in one ROW. • Single-circuit lattice steel structures. • Approximate number of structures: 199. • Line length: Approximately 45.9 miles. • No optical signal regeneration sites. • See Figure A-4.
Segment 3A – Anticline to Bridger 345-kV Yard 	• Single-circuit 345-kV transmission line in one ROW. • Single-circuit H-Frame steel structures. • Approximate number of structures: 25. • Line length: Approximately 5.1 miles. • No optical signal regeneration sites. • See Figure A-4.
Segment 4 – Anticline to Populus	• Single-circuit 500-kV transmission line in one ROW. • Single-circuit lattice steel structures. • Approximate number of structures: 893. • Line length: Approximately 197.6 miles. • Three optical signal regeneration sites. • See Figures A-5 and A-6.

Table 3.1-2. Summary of Project Facilities (continued)

Project Facility	Description
Segment 5 – Populus to Borah	• Single-circuit 500-kV transmission line in one ROW. • Single-circuit lattice steel structures. • Approximate number of structures: 245. • Line length: Approximately 55.7 miles. • No optical signal regeneration sites. • See Figure A-7.
Segment 6 – Borah to Midpoint	• Re-energize existing 345-kV system to 500-kV (this line segment was previously constructed to 500-kV standards). • Single-circuit lattice steel structures. • Transmission line construction only required at segment ends to reroute from the existing 345-kV substation bays to the proposed 500-kV substation bays. • Structure type illustration is only for the new structures required. • Approximate number of structures: 10. • See Figure A-8.
Segment 7 – Populus to Cedar Hill	• Single-circuit 500-kV transmission line in one ROW. • Single-circuit lattice steel structures. • Approximate number of structures: 534. • Line length: Approximately 118.2 miles. • Two optical signal regeneration sites. • See Figure A-9.
Segment 8 – Midpoint to Hemingway	• Single-circuit 500-kV transmission line in one ROW. • Single-circuit lattice steel structures. • Approximate number of structures: 577. • Line length: Approximately 131.5 miles. • Two optical signal regeneration sites. • See Figure A-10.
Segment 9 – Cedar Hill to Hemingway	• Single-circuit 500-kV transmission line in one ROW. • Single-circuit lattice steel structures. • Approximate number of structures: 707. • Line length: Approximately 162.2 miles. • Two optical signal regeneration sites. • See Figure A-11.
Segment 10 – Midpoint to Cedar Hill	• Single-circuit 500-kV transmission line in one ROW. • Single-circuit lattice steel structures. • Approximate number of structures: 155. • Line length: Approximately 34.4 miles. • No optical signal regeneration sites. • See Figure A-12.

Table 3.1-2. Summary of Project Facilities (continued)

Project Facility	Description
Substation Facilities	
Windstar Substation	• Expansion of existing substation. • Developed acreage: increase the fenced area of the 230-kV substation by approximately 10 acres. • Existing access road is gravel and will not need extension for Gateway West. • 230-kV circuit breakers and related switching equipment, bus and support structures, potential and current transformers, 230-kV shunt capacitor banks. • 230-kV line termination structures approximately 70 feet in height. • Control, protection, and communications equipment. • Addition of new control building within the substation fenced area. • See Figure A-16.
Dave Johnston Power Plant	• Modification of existing substation. • Existing access road is adequate. • All construction will be inside the existing fence line. No additional area is required. • 230-kV circuit breakers and related switching equipment, bus and support structures, potential and current transformers. • 230-kV line termination structures approximately 70 feet in height. • Control, protection, and communications equipment added to the existing control building. • See Figure A-17.
Heward Substation	• Proposed substation. • Developed acreage: approximately 5 acres fenced immediately adjacent to the existing Difficulty substation. • 230-kV circuit breakers and related switching equipment, bus and support structures, potential and current transformers. • 230-kV line termination structures approximately 70 feet in height. • Control, protection, and communications equipment. • Addition of new control building within substation fenced area. • See Figure A-18.
Shirley Basin Substation	• Modification of existing substation • Existing access road is adequate. • All construction will be inside the existing fence line. No additional area is required. • 230-kV circuit breakers and related switching equipment, bus and support structures, potential and current transformers. • 230-kV line termination structures approximately 70 feet in height. • Control, protection, and communications equipment added to the existing control building. • See Figure A-19.

Table 3.1-2. Summary of Project Facilities (continued)

Project Facility	Description
Substation Facilities	
Aeolus Substation	• Proposed substation. • Developed acreage: Approximately 135 acres fenced with an improved access road. • Construction of the Aeolus Substation will require upgrading County Route 121. This upgrade will result in approximately 64 acres of construction disturbance and 33 acres of new permanent roadway, including replacement of an existing bridge. • 500-kV and 230-kV circuit breakers and related switching equipment, bus and support structures, 500/230-kV transformer banks, 500-kV shunt reactor banks, 500-kV and 230-kV shunt capacitor bans, potential and current transformers. • Control, protection, and communications equipment. • 500-kV line termination structures approximately 135 feet in height. • 230-kV line termination structures approximately 70 feet in height. • Addition of new control buildings within the substation fenced area. • New Static Var Compensator occupying about 10 to 15 acres within the substation fenced area, housed in a building that contains power electronic equipment and associated cooling equipment. • See Figure A-13.
Anticline Substation	• Proposed substation. • Developed acreage: Approximately 125 acres fenced with an improved access road. • To access the new 500-kV yard, an existing dirt road about a mile long will be improved with construction of an all-weather surface with improved access approaches, main highway entrance, and Union Pacific Railroad (UPRR) crossing arrangements. • 500-kV and 345-kV circuit breakers and related switching equipment, bus and support structures, 500/345-kV transformer bank, 345-kV phase shifting transformer, 500-kV shunt reactor banks, 500-kV series capacitor bank, and 500-kV shunt capacitor banks, potential and current transformers. • 500-kV line termination structures approximately 135 feet in height. • Control, protection, and communications equipment. • Addition of new control buildings within the substation fenced area. • See Figure A-14.
Jim Bridger 345-kV Substation	• Expansion of existing substation. • Existing access road is adequate. • Expansion of 345-kV yard by 10 acres. • Additions to Jim Bridger 345-kV yard, including 345-kV circuit breakers and related switching equipment, bus and support structures, potential and current transformers. • Development of a new 345-kV transmission line termination structure approximately 100 feet in height to connect with the proposed line to Anticline Substation. • Control, protection, and communications equipment added inside the existing control building. • See Figure A-20.

Table 3.1-2. Summary of Project Facilities (continued)

Project Facility	Description
Substation Facilities	
Midpoint Substation	• Expansion of existing substation. • Developed acreage: increase the fenced area by approximately 40 acres. • Existing access roads are paved and will not need extension. • 500-kV circuit breakers and related switching equipment, bus and support structures, 500-kV shunt reactor banks, 500-kV series capacitor bank, 500-kV shunt capacitor banks, potential and current transformers. • 500-kV line termination structures approximately 135 feet in height. • Control, protection, and communications equipment added to existing control building. See Figure A-23.
Cedar Hill Substation	• Proposed substation. • Developed acreage: approximately 55 acres fenced with access road. Adjacent existing road is gravel and will not need extension. • 500-kV circuit breakers and related switching equipment, bus and support structures, 500-kV shunt reactor banks, 500-kV shunt capacitor banks, potential and current transformers. • 500-kV line termination structures approximately 135 feet in height. • Control, protection, and communications equipment. • Addition of new control building within the substation fenced area. • Up to 5 single circuit 500-kV structure relocations required on existing line from Borah Substation. • See Figure A-15.
Hemingway Substation	• Expansion of existing substation. • Expansion of existing station to add a 500-kV line bay for termination of the Hemingway – Midpoint and the Hemingway – Cedar Hill transmission lines. • All construction will be inside the existing fence line. No additional area is required. • Existing access is adequate. • 500-kV circuit breakers and related switching equipment, bus and support structures, 500-kV shunt reactor banks, 500-kV series capacitor bank, 500-kV shunt capacitor banks, potential and current transformers. • 500-kV line termination structures approximately 135 feet in height. • Control, protection, and communications equipment added to the existing control building. See Figure A-24.

Table 3.1-2. Summary of Project Facilities (continued)

Project Facility	Description
Substation Facilities	
Populus Substation	• Expansion of existing substation. • Developed acreage: increase the fenced area by approximately 80 acres. • Existing access road is adequate. 500-kV and 345-kV circuit breakers and related switching equipment, bus and support structures, 500/345-kV transformer bank, 500-kV shunt reactor banks, 500-kV series capacitor bank, 500-kV shunt capacitor banks, potential and current transformers. 500-kV line termination structures approximately 135 feet in height. • Control, protection, and communications equipment. • Addition of new control building within the substation fenced area. See Figure A-21.
Borah Substation	• Expansion of existing substation. • Developed acreage: increase the fenced area by approximately 35 acres. • Existing access road is gravel and will not need extension. • 500-kV and 345-kV circuit breakers and related switching equipment, bus and support structures, 500/345-kV transformer bank, 500-kV shunt reactor banks, 500-kV shunt capacitor banks, potential and current transformers. 500-kV line termination structures approximately 135 feet in height. • Control, protection, and communications equipment added inside the existing control building. • Up to 5 single circuit 500-kV structure relocations required on existing line from Midpoint Substation. • See Figure A-22.

Table 3.1-2. Summary of Project Facilities (continued)

Project Facility	Description
Ancillary Facilities	
Communications and Control Facilities – Optical Signal Regeneration Sites	• Regeneration sites are required to amplify the system control and monitoring signals carried over the fiber optic cable attached to the transmission towers. • A total of up to 12 regeneration sites will be needed for the Project. Segments requiring regeneration sites are noted in the transmission line section of this summary table. The locations for the regeneration sites are determined after the preferred route is identified and detailed design engineering is completed. • Regeneration sites will be located either within a substation or at another location along the route. • Regeneration sites are located within a 75- X 75-foot fenced area. • Typical building dimensions within the fenced area are 12 feet wide X 32 feet long X 9 feet tall. • The fiber within the OPGW cable supported on the transmission structures is routed in and out of the regeneration site building from the nearest transmission structure either underground or overhead along two independent diverse paths. • Electronic equipment, required to support the fiber optic cable installation, is located inside the building. • At sites not within a substation, a liquid propane fueled emergency generator will be installed to provide backup power during an outage of the local electric distribution system supply. • Maximum regeneration site spacing is 55 miles or less depending on access and proximity to local electric distribution lines. • The primary siting criteria for a regeneration site are: adjacent to the Gateway West transmission line ROW, proximity to existing low-voltage electric distribution lines to provide power to the facility, and the ability to easily access the site by vehicle.
Distribution Supply Lines	• Distribution line extensions are required to provide operational power and station service power at: o Up to 13 regeneration sites (locations to be determined during final design) o Aeolus 500-kV Substation (11 miles across BLM and private lands), needed for construction and possibly for operation. o Anticline 500-kV Substation (3.3 miles across private land) o Cedar Hill Substation (less than 200 feet across private land). • Typically provided from an existing distribution line located in proximity to the site. • Not required for modifications at Dave Johnston and Shirley Basin or for expansions at Windstar, Jim Bridger, Heward, Populus, Borah, Midpoint, and Hemingway Substations since these substations exist.

1/ Project design follows the Avian Power Line Interaction Committee recommendations. Details for tower construction and components such as conductor spacing are provided in Appendix B.

Table 3.1-3. Proposed Action Construction Schedule

Segment Number	Segment or Substation Name	Primarily Wyoming		Primarily Idaho			
		Phase 1		Phase 1		Phase 2	
		Start June 2015	End Dec 2018	Start June 2015	End Dec 2018	Start May 2017	End Dec 2021
	Windstar Substation	Windstar Expansion					
	Dave Johnson 230-kV Substation	Dave Johnson 230-kV Substation					
	Heward Substation	Heward Substation					
	Aeolus Substation	Aeolus Substation					
	Populus Substation	Populus Expansion					
	Anticline and Jim Bridger 345-kV Substations	Anticline Substation and 345-kV bays at existing Jim Bridger Substation					
1W(a)	Windstar – Aeolus #1	Single-Circuit 230-kV and rebuild a short section of the existing single-circuit 230-kV line					
1W(c)	Dave Johnston – Heward –Aeolus	Rebuild the existing single circuit 230-kV					
2	Aeolus – Creston	Single-Circuit 500-kV					
3	Creston – Anticline	Single-Circuit 500-kV					
3A	Anticline – Jim Bridger	Single-Circuit 345-kV					
4	Anticline – Populus	Single-Circuit 500-kV					
	Populus Substation			Populus Expansion			
	Cedar Hill Substation			Cedar Hill Substation			
	Hemingway Substation			Hemingway Expansion			
7	Populus – Cedar Hill			Single-Circuit 500-kV			
9	Cedar Hill – Hemingway			Single-Circuit 500-kV			
10	Midpoint – Cedar Hill			Single-Circuit 500-kV			
	Borah Substation					Borah Expansion	
	Midpoint Substation					Midpoint Expansion	
	Hemingway Substation					Hemingway Expansion	
5	Populus – Borah					Single-Circuit 500-kV	
6	Borah – Midpoint [1]					Existing single-circuit	
8	Midpoint – Hemingway					Single-Circuit 500-kV	

1/ Existing single circuit constructed to 500-kV standards (energized from 345 kV to 500 kV).

3.1.2 Structure Variation

In addition to the proposed self-supporting single-circuit steel lattice 500-kV structure, the Companies continue to consider an alternative single-circuit 500-kV guyed structure for use where terrain, land cover, and land use allow. During final design, the Companies will identify specific locations where this structure might be proposed for review and approval. Figure B-5 in Appendix B shows the ROW configuration for the guyed "Delta" and guyed "V" structures.

3.1.3 Proposed Route

The route changes since the January 2010 POD include elimination of Segment 1E and incorporation of Alternatives 2C and 4A into the Proposed Route.

Because the Project connects a series of three proposed and nine existing substations, it is described by segment and numbered sequentially between substations. The exception is between Segments 2 and 3 where the formerly proposed Creston Substation was eliminated. Table 3. 1-4 lists the Proposed Route segments. The reference points are illustrated in Appendix A, Figures A-2 through A-12 by segment.

Table 3.1-4. Summary of Proposed Route

Figure	Designation	Reference Points
Segment 1W – Windstar to Aeolus		
A-2	Segment 1W(a)	1,2
	Segment 1W(c)	1d, 1e, 1g, 2
Segment 2 – Aeolus to Creston		
A-3	Segment 2	2, 3
Segment 3 – Creston to Anticline		
A-4	Segment 3	3, 4
Segment 3A – Anticline to Bridger		
A-4	Segment 3A	3c, 4
Segment 4 – Anticline to Populus		
A-5, A-6	Segment 4	4, 5
Segment 5 – Populus to Borah		
A-7	Segment 5	5, 6
Segment 6 – Borah to Midpoint		
A-8	Segment 6	6, 8
Segment 7 – Populus to Cedar Hill		
A-9	Segment 7	5, 9
Segment 8 – Midpoint to Hemingway		
A-10	Segment 8	8, 11
Segment 9 – Cedar Hill to Hemingway		
A-11	Segment 9	9, 11
Segment 10 – Cedar Hill to Midpoint		
A-12	Segment 10	8, 9

3.1.4 Segment 1W – Windstar/Dave Johnston to Aeolus

Segment 1W is composed of Segments 1W(a) and 1W(c). Both consist of single-circuit 230-kV transmission lines. Segment 1W(a) will be a new transmission line and 1W(c) involves reconstruction of a portion of the existing Dave Johnston – Rock Springs 230-kV transmission line. Reconstruction of the existing transmission line is necessary to increase the load-carrying capacity of this existing line. The existing single conductor per phase will be replaced with two

larger conductors per phase, requiring the replacement of all of the existing wood structures with stronger steel-pole, H-frame structures, similar in height and appearance to the existing line. Each single-circuit line will be constructed in a separate ROW to meet reliability criteria. The 230-kV lines will be carried on steel H-frame structures between 60 and 90 feet tall (Appendix B, Figure B-1). Appendix A, Figure A-2 is a map of the Segment 1W routes. Segment 1W(a) will carry the fiber optic communication system for Segment 1. Because of its length it needs an optical signal regeneration site approximately midway along its route. Final locations for the regeneration station will be determined after the preferred alternative is selected and detailed design engineering completed.

3.1.4.1 Proposed Route 1W(a)

The Proposed Route 1W(a) extends south and west approximately 73.8 miles from the existing Windstar Substation to the proposed Aeolus Substation (points 1, 2). The Proposed Route crosses the Burlington Northern Railroad, North Platte River, U.S. Highway (US) 87/20, and Interstate 25 (I-25). At MP 4.0, the line turns to the southwest on the east side of Deer Creek, parallel to and west of Segment 1W(c). The routes maintain a minimum of separation of 1,500 feet to meet reliability criteria.

3.1.4.2 Proposed Route 1W(c)

Proposed Route 1W(c) is a rebuild of an existing 230-kV line from the existing Dave Johnston Power Plant to the proposed Aeolus Substation. The route leaves the existing substation at the Dave Johnston Power Plant and proceeds west and south to the proposed Aeolus Substation, a distance of approximately 73.6 miles (points 1d, 1e, 1g, 2). The Proposed Route crosses the North Platte River, Burlington Northern Railroad, US 87/20, and I-25. At MP 2.0, the route turns southwest on the east side of Deer Creek, crossing Deer Creek at MP 14.7 to join Segment 1W(a).

From Banner Mountain, Proposed Routes 1W(a) and 1W(c) follow similar paths, proceeding south and crossing into Natrona County at approximately MP 21.0. After crossing the county line, the two Proposed Routes cross the West Fork of Duck Creek Deer Creek Range and the western edge of the Medicine Bow National Forest, and then proceed generally south passing east of Ice Cave Mountain and Bates Creek Reservoir before crossing into Carbon County. At MP 44.3 Proposed Route 1W(c) enters and then exits the proposed Heward Substation adjacent to the existing Difficulty Substation. Both Proposed Routes then parallel SR 487 for about 14 miles across Shirley Basin. At MP 55.4, Proposed Route 1W(c) ties into existing transmission lines looping into and out of the existing Shirley Basin Substation before proceeding south, still parallel to Proposed Route 1W(a). At MP 58.0, both Proposed Routes turn southwest through Little Basin to the northwest of the Freezeout Mountains. At MP 64.0, the Proposed Routes diverge to a maximum separation of approximately 7,500 feet as Proposed Route 1W(a) swings west to avoid a private landing strip in Red Draw before turning south and crossing Difficulty Creek at MP 70.0. Both Proposed Routes cross the southern toe of the Freezeout Mountains at MP 70.5 and 69.0 before terminating at the proposed Aeolus Substation at MP 73.8 (MP 70.3 for the Dave Johnston – Rock Springs line) on the north side of the Medicine Bow River. Proposed Route 1W(c) enters and then exits the proposed Aeolus Substation, heading south to MP 71.0 before turning west to rejoin the existing Dave Johnston-Rock Springs line at MP 71.7. Approximately 1.2 miles of the existing 230-kV in the vicinity of the Aeolus Substation will be demolished in order to arrange the new line entry and exit points to the substation.

3.1.5 Segment 2 – Aeolus to Creston

Segment 2 consists of one single-circuit 500-kV transmission line between the proposed Aeolus Substation and the location of the originally planned Creston substation (hereafter abbreviated as Creston) near Wamsutter, Wyoming. This segment generally follows a combination of the WWE corridor and existing transmission lines. Appendix A, Figure A-3 is a map of Segment 2 between the Aeolus Substation and Creston.

Segment 2 as proposed will use 500-kV single-circuit lattice towers between 145 and 180 feet tall (Appendix B, Figure B-2). Segment 2 is about 92.0 miles long and therefore will need two optical signal regeneration sites, one site in the in the area south of Rawlins and another in the general location of the formerly-planned Creston substation. Final locations for regeneration stations will be determined after the preferred alternative is identified and detailed design engineering is completed.

The proposed 92.0 mile-long 500-kV single-circuit line (points 2, 3) exits the proposed Aeolus Substation directly west crossing County Route (CR) 121 and the Medicine Bow River paralleling the north side of the Seven Mile Hill Wind Energy Project. About 7.2 miles west of the substation, the route turns south, generally following Hanna Draw, for about 27.0 miles through the Hanna Sage Grouse Core Area and an active coal mining area north and west of Hanna. The Proposed Route between MP 3.0 and 30.0 was recommended as the preferred route by the Wyoming Governor's Office and follows the corridor established by EO-2011-5. At MP 28.0, the Proposed Route passes between Dana Ridge and Saint Mary's Ridge before turning west near Walcott Junction. The Proposed Route parallels north of I-80 for about 4.5 miles, crosses I-80 and the North Platte River south of the Fort Steele State Historic Site before continuing west between two bald eagle nest buffers on the west bank of the North Platte River at MP 38.0. From there, the route proceeds west, passing between two Wyoming Game and Fish Department (WGFD) parcels and a BLM Special Recreation Management Area (SRMA), and north Hogback ridge and multiple raptor nests. The Proposed Route then passes through alternating sections of private and BLM-managed land, following an existing pipeline northwest for 4 miles before again continuing west at MP 42.2.

Proceeding west, the Proposed Route passes north of Severson Flats and south of the Greenville Dome, the Wyoming State Penitentiary, and the Rawlins water treatment facility before crossing SR 71 about 2.7 miles south of Rawlins. West of SR 71, the route traverses Coal Creek and Coal Mine Ridge south of and parallel to an existing 230-kV line. The route continues at varying distances from the existing line to Creston. In this last 40-mile segment, the route crosses Hogback Ridge, Red Rim, SR 789, and several active oil and gas fields before reaching Creston about 4.0 miles south of Wamsutter.

The Proposed Route follows the WWE corridor, which is also a BLM-designated ROW corridor (BLM 2008a), where feasible. It diverts only to stay within the transmission corridor through core sage-grouse population areas established by the Governor's Executive Order (EO-2011-5), and to avoid the Fort Fred Steele State Historic site, the Seven Mile Hill Wind Energy Project, sage-grouse leks, and oil and gas well infrastructure. The Proposed Route is within or parallel to the WWE corridor (which is also an existing utility corridor) for 50.0 miles out of a total route length of 92.0 miles. Of its 92.0 mile length, the route parallels existing transmission lines for 50.0 miles. The Proposed Route crosses the Hanna Sage-Grouse Core Area (Hanna Core Area) within the Wyoming Governor's EO-2011-5 designated corridor on a Greenfield route from approximately MP 3.0 to 30.0.

3.1.6 Segment 3 – Creston to Anticline

Segment 3 has two components: a short 5.1 mile 345-kV interconnection between the existing Jim Bridger 345-kV substation and the proposed Anticline substation (Segment 3A see Section 3.1.7), and a 45.9 mile long 500-kV line between the terminus of Segment 2 near the previously proposed Creston substation and the proposed Anticline substation (called simply Segment 3).

The 500-kV portion of Segment 3 is located between points 3 and 4. It begins at Creston and proceeds west for 17 miles, at which point it turns northwest and crosses I-80 at MP 19.3. This 17-mile segment parallels I-80 approximately 2 to 3 miles to the south, north of the Delaney Rim. Once north of I-80, Segment 3 stays north of this highway until it reaches the east side of the Jim Bridger Power Plant access road. In this segment, oil and gas pipelines and wells were important routing considerations. At MP 43.1, the 500-kV circuit turns north and proceeds for about 2.6 miles along Deadman Wash parallel to the power plant road before entering the proposed Anticline Substation.

Appendix A, Figure A-4 is a map for Segment 3. Segment 3 as proposed will use 500-kV single-circuit lattice towers between 145 and 180 feet tall (Appendix B, Figure B-2). Segment 3 (in total) parallels existing transmission lines for 42.1 miles.

No optical signal regeneration site is needed.

3.1.7 Segment 3A –Anticline to Bridger

Because Segment 3A is a different voltage from the rest of Segment 3, it is listed and treated separately for the purposes of a technical project description. A 5.1-mile interconnecting 345-kV transmission line will be constructed between the proposed Anticline Substation and the existing Jim Bridger Substation 345-kV yard to electrically connect the two substations. About 0.5 mile east of the plant access road, this route angles to the northwest on the east side of Deadman Wash before turning west and then south into the existing substation. Appendix A, Figure A-4 is a map for Segment 3A.

No optical signal regeneration site is needed.

3.1.8 Segment 4 – Anticline to Populus

One single-circuit 500-kV line is proposed between the proposed Anticline Substation and the existing Populus Substation near Downey in southern Bannock County, Idaho. This segment generally follows an existing transmission line corridor. Appendix A, Figures A-5 and A-6 show the Proposed Route for Segment 4 in Wyoming and Idaho, respectively.

Segment 4 as proposed will use 500-kV single-circuit lattice towers between 145 and 180 feet tall (Appendix B, Figure B-2).

Segment 4 is 197.6 miles long and will require three optical signal regeneration sites spaced approximately equidistant along its route. Final locations for regeneration stations will be determined after the preferred alternative is identified and detailed design engineering is completed.

The proposed single-circuit 500-kV segment extends from the proposed Anticline Substation southeast of the Jim Bridger Power Plant and partially along the existing 345-kV corridor in Sweetwater County, Wyoming, to the existing Populus Substation west of the community of Downey in Bannock County, Idaho (points 4, 5). The Proposed Route exits the proposed Anticline Substation to the west and parallels to the south side of the existing 345-kV corridor for

about 40.0 miles, then, after by-passing the Seedskadee National Wildlife Refuge, continues to follow the existing transmission lines, except for two short deviations in the vicinity of the two U.S. Highway 30/SR 89 crossings, a further 120.0 miles. The Proposed Route crosses the Greater South Pass Core Area in the Wyoming Governor's EO-2011-5 designated corridor between MP 32.0 to MP 45.0. The route then crosses the Seedskadee Core Area in the Wyoming Governor's EO-2011-5 designated corridor between MP 58.0 to MP 70.2. The route further crosses the Sage Core Area in the Wyoming Governor's EO-2011-5 designated corridor between MP 104 to MP 120. All three crossings of sage grouse core area occur adjacent to existing 345-kV transmission lines.

The Proposed Route crosses Deadman Wash and North Baxter Basin before crossing Killpecker Creek, US 191 and the White Mountains about 10 miles north of Rock Springs. The route continues to parallel the existing 345-kV corridor west toward the Seedskadee National Wildlife Refuge where it deviates south at MP 45.8 through Stevens Flat to avoid the southern boundary of the Refuge near Big Island. The Proposed Route crosses the Green River at MP 52.0 then turns north at MP 53.4 paralleling SR 372 for approximately 3.5 miles before turning west again to parallel the existing 345-kV corridor through the oil and natural gas fields in Whiskey Basin, crossing Oyster Ridge and US 189 about 4.5 miles north of Kemmerer. Between MP 67.0 and MP 136.8, the Proposed Route follows the alignment recommended by the Wyoming Governor's Office. At MP 100.0, the Proposed Route crosses to the north side of the existing 345-kV corridor in the Pomeroy Basin before continuing west parallel to the corridor, crossing Commissary Ridge and then the Ham's Fork River south of Kemmerer Reservoir. Still parallel to the 345-kV corridor, the route continues to the northwest across the Ham's Fork Plateau and the Tunp Range, deviating slightly to cross US 30/SR 89, before crossing the Bear River about 0.5 miles south of Cokeville.

At MP 126.0 the route continues northwest crossing Boundary Ridge and proceeding from Lincoln County, Wyoming, into Bear Lake County, Idaho, at MP 130.0. From the county line, the Proposed Route continues to parallel the north side of the existing 345-kV corridor crossing the Bear River at MP 134.3 before deviating slightly across Sheep Creek and the Sheep Creek Hills. The Proposed Route then continues west to cross US 30 about 2.8 miles south of the community of Montpelier.

The Proposed Route remains parallel and offset about 1,500 feet northeast of the existing 345-kV corridor crossing Bear Lake Valley, US 89, and the Bear River before proceeding to the eastern boundary of the Caribou-Targhee National Forest (NF) at MP 161.1. The Proposed Route crosses about 9.2 miles within the NF boundary on a new ROW north of, but offset from, the existing 345-kV line. The route then rejoins the existing corridor on the west side of SR 34 crossing Mound Valley and the Bear River for a fourth time.

At MP 180.0, the Proposed Route leaves the existing 345-kV corridor and proceeds west passing along the north side of Dry Hollow Mountain and angling northwest toward the community of Downey. About 2 miles south of Downey, the Proposed Route crosses US 91 and the Marsh Valley. It then continues northwest to the existing Populus Substation located about 1.3 miles west of Downey.

3.1.9 Segment 5 – Populus to Borah

One single-circuit 500-kV line is proposed between the existing Populus Substation and the existing Borah Substation in Power County, Idaho. This line will be constructed with 500-kV single-circuit lattice steel towers between 145 and 180 feet tall (Appendix B, Figure B-2).

Appendix A, Figure A-7 shows the Proposed Route for Segment 5. Segment 5 is 54.6 miles long and therefore will not need optical signal regeneration sites.

The proposed single-circuit 500-kV segment is approximately 55.7 miles long between points 5 and 6. Two existing 345-kV transmission lines extend between the Populus and Borah Substations. The Proposed Route follows the existing lines from the existing Populus Substation northwest for approximately 12 miles, crossing the existing lines just north of Hawkins Reservoir and south of Hawkins Basin, at which point the Proposed Route follows a Greenfield alignment for the remainder of the route, extending northwest along the foothills to the west of Hawkins Basin before turning west, south of the Fort Hall Indian Reservation, crossing the Arbon Valley and the Deep Creek Mountains and then turning north east of Rockland and on to the existing Borah Substation. The first part of Segment 5 crosses I-15 about 2.0 miles northwest of the Populus Substation. At MP 12.4, the Proposed Route turns west crossing the existing 345-kV corridor and then the Bannock County/Power County line at MP 18.2. The route continues west, parallel to the proposed Populus – Cedar Hill line (Segment 7) crossing the Arbon Valley and the Deep Creek Mountains south of the Fort Hall Reservation. At the west side of these mountains, the Proposed Route turns northerly between the Deep Creek Mountains and SR 37.

Proceeding north along the western foothills of the Deep Creek Mountains, the route crosses several drainages, particularly the East Fork of Rock Creek, generally avoiding farm land located west of the route. The route crosses Visual Resource Management (VRM) Class II land at several points, but avoids the Bowen Canyon Bald Eagle Sanctuary in the mountains to the east. At MP 49.9 the route proceeds west, again parallel to the existing 345-kV corridor, crossing I-86, SR 37, and US 30 before crossing the Snake River and entering the existing Borah Substation.

From MP 36.0 north to the existing Borah Substation, the current Proposed Route is about 1 to 2 miles east of the Companies' original Proposed Route. Meetings with local landowners and Power County representatives identified a more acceptable route that was subsequently adopted by the Companies. As a result, the current Proposed Route is located more on public land.

The Segment 5 Proposed Route is mostly adjacent to, but offset approximately 1,500 feet from, the Segment 7 Proposed Route for approximately 30 miles. Of its total length, the Proposed Route will be Greenfield for 39.7 miles and parallel to existing transmission lines for 16.0 miles.

3.1.10 Segment 6 – Borah to Midpoint

In Segment 6, from the existing Borah Substation to the existing Midpoint Substation located approximately 9 miles south of Shoshone, Idaho, the voltage will be increased to 500 kV on the existing Midpoint – Kinport 345-kV transmission line. The line will be routed into the proposed 500-kV yard at the Borah Substation requiring approximately five structure replacements in the immediate vicinity of the Borah and Midpoint Substations but requiring no other transmission line construction. The remaining line from Borah to Kinport terminates in the existing 345-kV yard at the Borah Substation and will remain in operation at 345 kV. The structures utilized for the reroutes on each end of this line segment are 500-kV single-circuit lattice steel towers between 145 and 180 feet tall (Appendix B, Figure B-2). Appendix A, Figure A-8 shows the locations of the Borah and Midpoint Substations and the existing 345-kV line.

The line segment between the Borah and Midpoint Substations, Segment 6, is part of the existing 345-kV transmission line that was constructed to 500-kV design standards although currently operated at 345 kV. No new transmission line construction will be required along

Segment 6 to operate this line segment at 500 kV, except in the vicinity of the Borah and Midpoint Substations. At the Borah and Midpoint Substations, the line will be rerouted and re-terminated from the existing 345-kV line bays into the new 500-kV line bays at each substation. Several new structures and conductors will be needed adjacent the Midpoint Substation to reroute the existing 345-kV line from its termination on the north side of the existing station to the proposed 500-kV yard expansion on the south side. Several new structures and conductors will also be needed at the Borah Substation to reroute the line from the northeast side of the existing station to the proposed 500-kV yard addition on the south side. A new structure will be needed to route the 345-kV line between Borah and Kinport into the existing 345-kV yard on the east side. The line between Borah and Midpoint will then be energized at 500 kV.

3.1.11 Segment 7 – Populus to Cedar Hill

One 118.2 mile single-circuit 500-kV transmission line is proposed between the existing Populus Substation and the proposed Cedar Hill Substation near the Cassia County/Twin Falls County approximately 14 miles southeast of Twin Falls. The line will be constructed utilizing 500-kV single-circuit lattice steel towers between 145 and 180 feet tall (Appendix B, Figure B-2). Appendix A, Figure A-9 shows the Proposed Route for Segment 7. Because Segment 7 is 118.2 miles long, it will need two optical signal regeneration sites along its route. Final locations for regeneration stations will be determined after the preferred alternative is identified and detailed design engineering is completed.

The proposed single-circuit 500-kV line route (points 5, 9) will extend from the expanded Populus Substation about 9.0 miles along the east side of the existing 345-kV lines before turning west and crossing the existing lines south of Cedar Mountain and Hawkins Reservoir. The route turns northwest along the foothills west of Hawkins Basin before turning west and passing south of Pauline. From there, the Proposed Route continues west across the Arbon Valley and the Deep Creek Mountains before crossing SR 37 less than 1 mile south of Rockland at MP 41.0. This segment continues west another 7 miles across the northern foot of the Sublett Range.

From this point it crosses into Cassia County and then proceeds across the Raft River Valley, where it turns southwest along the northern toe of the Cotterel and Albion Mountains before turning west for approximately 22 miles across an area of extensive irrigated cropland and dairy operations, entering the proposed Cedar Hill Substation at MP 118.2. Of its 118.2 mile length, the Proposed Route will be Greenfield for 107 miles and parallel existing transmission lines for 11.2 miles.

3.1.12 Segment 8 – Midpoint to Hemingway

One single-circuit 500-kV transmission line is proposed between the existing Midpoint Substation and the existing Hemingway Substation, located approximately 30 miles southwest of Boise, Idaho. The line will be constructed using steel lattice towers between 145 and 180 feet tall (Appendix B, Figure B-2). Appendix A, Figure A-10 shows the proposed Segment 8 route. The Proposed Route is about 131.5 miles long and therefore two optical signal regeneration sites, about 40 to 50 miles apart, will be needed along the route. Final locations for regeneration stations will be determined after the preferred alternative is identified and detailed design engineering is completed.

The 131.5 mile-long Proposed Route (points 8, 11) proceeds west-northwest, parallel to an existing 230-kV line, passing just north of the juncture of the Jerome, Lincoln, and Gooding County lines near MP 9. This route continues in the same direction, passing between Gooding and Wendell before crossing the Malad River at MP 19.3. Southwest of Pioneer Reservoir, the

route angles northwest away from the existing 230-kV corridor to avoid impacts to an identified residence, crossing the Gooding County/Elmore County line at MP 36.9. At MP 42.0 the route rejoins the existing 230-kV corridor. Between MP 45.8 to MP 48.1 and MP 50.2 to MP 51.1, the Proposed Route crosses VRM Class I in an area of multiple transmission lines, entering the WWE corridor at MP 52.0. At MP 58, the route parallels south and west of the existing PacifiCorp 500-kV line offset 1,500 feet for reliability reasons. The route crosses US 20 at MP 68.5 approximately 3.8 miles northeast of Mountain Home and turns west at MP 86.2,, crossing I-84 at MP 90.2 and the Elmore County/Ada County line at MP 90.9. Continuing west, the Proposed Route is located approximately 1,500 feet south of the existing Summer Lake to Midpoint 500-kV transmission line through the Morley Nelson Snake River Birds of Prey National Conservation Area (SRBOP).

The route enters the SRBOP at MP 98.8 and continues to the west, then southwest through Ada County. A 4.7-mile segment of the route passes through a portion of the Alpha Maneuver Sector for the Idaho Army National Guard (IDANG), which is located in the SRBOP. At MP 116, the route turns more to the south, crossing the Snake River, the Halverson and Wees Bar non-motorized areas (NMA) and the Guffey Butte-Black Butte Archaeological District between MP 117 and MP 120. The Snake River in this area forms the Ada County/Owyhee County line. The route continues southwest and then west around Guffey Butte before intercepting a WWE corridor and turning northwest at MP 124.2, approximately 3.5 mile north of Murphy. The route leaves the SRBOP at MP 126.7 before ending at the existing Hemingway Substation. Of its 131.5 mile length, approximately 15.4 miles are Greenfield and 116.1 miles parallel existing transmission lines.

3.1.13 Segment 9 – Cedar Hill to Hemingway

One single-circuit 500-kV transmission line is proposed between the proposed Cedar Hill and the existing Hemingway Substations. The line will be constructed using 500-kV single-circuit lattice steel structures between 145 and 180 feet tall (Appendix B, Figure B-2). Appendix A, Figure A-11 provides details on the transmission line route between the Cedar Hill and Hemingway Substations.

Segment 9 is 162.2 miles long and therefore will need two optical signal regeneration sites along its route. Final locations for regeneration stations will be determined after the preferred alternative is identified and detailed design engineering is completed.

The 162.2 mile long Proposed Route (points 9, 11) for the single-circuit 500-kV line proceeds generally west through public and private rangeland. The route continues west about one mile south of Twin Falls Military Reservation, and crosses US 93 at MP 17.7. At MP 27.9 the route turns northwest to parallel the east side of Salmon Falls Creek adjacent to an existing 138-kV transmission line for about 5.0 miles. At MP 33 the Proposed Route crosses the Salmon Falls Creek at the north end of Lilly Grade adjacent to an existing single-phase 34.5-kV distribution line just north of the Salmon Falls Creek WSA and a VRM I designated viewshed. The area crossed is still part of an Area of Critical Environmental Concern (ACEC) and eligible Wild and Scenic River (WSR). Several raptor nest buffers are crossed as the route continues northwest through the Bruneau Desert. At MP 46.6, the route enters Owyhee County and turns to the north along the Twin Falls County/Owyhee County line for about 10 miles before turning to the northwest at MP 56.5, then into Elmore County at MP 63.4. Between MP 46.6 and MP 63.4 the Proposed Route will be just inside the east boundary of the general Jarbidge Military Operating Area (MOA). Within the MOA, the height of the transmission structures normally cannot extend more than 100 feet above ground level. Consultation between Twin Falls County and the U.S.

Air Force has determined that this height restriction would not apply and this minor encroachment is acceptable (Postema 2010).

AT MP 79.0, the Proposed Route joins the designated WWE corridor northwest of Deadman Flat, entering the SRBOP at MP 88.0. The Proposed Route passes through the Saylor Creek Air Force Range restricted area and to the south of Bruneau Dunes State Park in the between MP 91 to MP 95.6. Consultation between representatives of the BLM, U.S. Air Force, Idaho Department of Parks and Recreation, and the Companies has determined that the location of the Proposed Route within the restricted Military Operating Area and just to the south of Bruneau Dunes State Park is acceptable with micro-siting . From this point, the Proposed Route proceeds generally southwest, crossing the Bruneau River and the Bruneau Valley near MP 99.0.

On the west side of this valley the route turns northwest, crosses SR 51, and then continues northwesterly on the southwest side of the Bruneau River, then the Snake River and SR 78. In this portion, the Proposed Route follows the WWE corridor on BLM-managed land but frequently changes direction on private segments to avoid rural residences, the small communities of Murphy and Oreana and, as much as possible, cultivated lands. The route reenters the SRBOP between MP 142.4 to MP 146.2 and again between MP 151.5 to MP 152.6, mainly within the WWE corridor on BLM-managed land, and continues north and west into the Hemingway Substation at MP 162.2.

3.1.14 Segment 10 – Midpoint to Cedar Hill

One single-circuit 500-kV transmission line is proposed between the existing Midpoint and proposed Cedar Hill Substations. The line will be constructed using 500-kV single-circuit lattice steel structures between 145 and 180 feet tall (Appendix B, Figure B-2). Appendix A, Figure A-12 shows the proposed Segment 10 route between Midpoint and Cedar Hill. The Midpoint Substation is described under Segment 8 and the Cedar Hill Substation is described under Segment 9. Segment 10 will not need an optical signal regeneration site along its route.

The 34.4 mile-long Proposed Route (8, 9) exits the existing Midpoint Substation parallel to an existing 345-kV line and within the designated WWE corridor in a southeasterly direction for 11 miles. At this point, the route turns south crossing the North Side Main Canal, and angles southeast again before turning south again at MP 18.8. From MP 20.5 to the proposed Cedar Hill Substation the Proposed Route again parallels the existing 345-kV line. The route continues south across Goose Lake west of the community of Eden and then crosses I-84 to the west of Skeleton Butte at MP 23.0, the Snake River(Jerome County/Twin Falls County line) at MP 24.3, and US 30 at MP 26.1, before entering the proposed Cedar Hill Substation at MP 34.4. The Proposed Route follows the alignment of the planned Southwest Intertie Project. If that project is constructed, it will serve in place of the Gateway West Segment 10 Proposed Route. Only one transmission line will be constructed under any circumstances.

3.2 Substations

The Project includes three proposed substations and expansions or modifications at nine existing substations.

3.2.1 Proposed Substations

3.2.1.1 Aeolus Substation

The Aeolus Substation site is located in Carbon County approximately 10 miles west of Medicine Bow, Wyoming, on private land as shown in Appendix A, Figure A-3. The substation

is the southern terminus of Segment 1. The Aeolus Substation is proposed to electrically terminate the new 230-kV line 1W(a), the reconstructed portion of the Dave Johnston – Rock Springs 230-kV line 1W(c) looped in and out of the Aeolus Substation, and the new transmission lines that will extend west to the Anticline Substation (Segments 2 and 3).

Equipment installed includes 500-kV and 230-kV circuit breakers, high-voltage switches, bus supports, transmission line termination structures, and other equipment for each transmission line. The 500-kV transmission line termination structures are approximately 125 to 135 feet tall. Additional equipment including 500/230-kV transformers, 500-kV capacitors and 500-kV shunt reactors (which resemble a transformer in appearance) will be installed. In addition, a Static Var Compensator will be installed for system reliability. This equipment will occupy about 10 to 15 acres within the overall substation fenced area. A new control house will be added to accommodate the necessary system communications and control equipment. Site development will disturb approximately 170 acres and 135 acres will be required for operations. (Appendix A, Figure A-13).

The Aeolus Substation 500-kV transformers weigh approximately 600,000 pounds during shipment. They will be transported to the Project vicinity, offloaded to a heavy haul transporter, and then transported over the highway to the Aeolus site. The heavy haul transporter is approximately 190 feet long, have 35 axles, and weigh 300,000 to 325,000 pounds. Due to the size of the vehicle, a route with minimal grade and large turning radii is necessary. CR 121 will be upgraded to provide the required access.

The Aeolus Substation will require development of a distribution line to provide electrical power during construction and operation. The 11 mile distribution line will be located within or adjacent to the CR 121 ROW between U.S. 30 and the site. Figure 3.2-1 shows the location of CR 121 and access routes to the Aeolus site.

Figure 3.2-1. CR 121 Access to Aeolus Substation

CR 121 Improvements

Existing Conditions: CR 121 is currently a single-lane road, about 20 feet wide and about 11 miles long, from U.S. Hwy. 30 to the Aeolus Substation. It is in poor condition with a thin layer of gravel over a clay base and without turnouts. It includes a single-lane bridge over the Medicine Bow River built in 1914 and refurbished with a metal deck around 1972 (see Figure 3.2-2). The bridge was recently inspected by the Wyoming Department of Transportation and found to be in poor structural condition. Its current weight limitations include a 10-ton weight limit for single axle trucks and 13-ton limit for multiple axle trucks, which will not accommodate the heavy haul transporters.

Figure 3.2-2. Looking Westerly Toward the Existing CR 121 Bridge

Needed Improvements: CR 121 will be reconstructed from U.S. Hwy 30 to the immediate vicinity of the Aeolus Substation. Reconstruction will result in approximately 64 acres of construction disturbance and 33 acres of new permanent roadway. Reconstruction includes the following:

- Realignment of the roadway to improve negotiability, visibility, and safety;
- Addition of turnouts, expanding the roadway to 30 feet wide for up to 100 feet along the roadway every mile or where existing terrain and alignment will not accommodate the heavy haul transporter or sight distances are inadequate;
- Improved roadway, likely to include subgrade improvement and application of a geotextile fabric covered by 6 to 8 inches of compacted aggregate base;
- Inspection of all culverts for adequacy and replacement of up to 16;
- Inspection of all cattle guards for adequacy and replacement of up to 6;
- Replacement of the bridge with one that meets Wyoming Department of Transportation standards for HS-20 loading[3]. Based on preliminary engineering, the new bridge

[3] Loading is either H-20 or HS-20 based on an axle load of 32 kilo-pounds. This load is divided by the number of tires on each axle.

requires an approximate span of 125 to 150 feet and a 24-foot travelway width. The new bridge will be installed just downstream (south) of the existing bridge; and

- After the new bridge is completed, removal of the old bridge and its approaches.

Prior to conducting any work, the existing bridge will be evaluated for eligibility for listing on the National Register of Historic Places and any required mitigation, including photographic recordation, will be completed.

3.2.1.2 Anticline Substation

The proposed Anticline Substation is located about 2.5 miles southeast of the Jim Bridger Power Plant, along the east side of Deadman Draw, approximately 30 miles east of Rock Springs, Wyoming, as shown on Appendix A, Figure A-4. The proposed substation will consist of a new 500-kV yard constructed southeast of the power plant occupying a fenced area of about 125 acres on private land (Appendix A, Figure A-14). Equipment to be installed within the fenced area includes 500-kV and 345-kV circuit breaker bays and associated equipment, bus supports, high-voltage switches, transmission line termination structures, 500/345-kV transformers, 345-kV phase shifting transformer, 500-kV reactors, 500-kV capacitors, and a new control building to house communications and control equipment. Access to the new 500-kV yard requires improving about 0.5-mile of existing dirt road to a 20- to 24-foot all-weather surface road between the existing Jim Bridger Power Plant access road and proposed Anticline Substation fenceline, improved highway access approaches, and a Union Pacific Railroad crossing. Within the substation site, approximately 0.4 mile of intermittent stream channel will be realigned to provide site drainage. Site development will disturb approximately 135 acres and 125 acres would be required for operations.

The new 500-kV line from the interconnection with Segment 2 (part of Segment 3), the new 500-kV line going to Populus Substation (Segment 4), and the new 345-kV line going to the Jim Bridger 345-kV Substation (Segment 3A) will connect into the Anticline Substation yard.

3.2.1.3 Cedar Hill Substation

The proposed Cedar Hill Substation will be located on public and private land approximately 20 miles southeast of Twin Falls, Idaho, as shown on Appendix A, Figure A-15 as the western terminus of Segment 7. The Cedar Hill Substation is the interconnection point for three new Gateway 500-kV transmission lines. The three lines include the 500-kV line from the Populus Substation (Segment 7), the 500-kV line from the Hemingway Substation (Segment 9), and the 500-kV line from the Midpoint Substation (Segment 10).

Each of the transmission line bays contain high-voltage circuit breakers and switches, bus supports, and control equipment. New 500-kV reactors and 500-kV capacitors will be installed within the fenced area. Transmission line termination structures, approximately 125 to 135 feet tall, will be installed to terminate the 500-kV conductors. A new control building will be constructed to house the 500-kV communications and control equipment for the proposed Gateway 500-kV transmission lines. Approximately 1,000 feet of new access road will be required between the existing county line road and the substation.

Site development will disturb approximately 65 acres and 55 acres will be required for operations.

3.2.2 Existing Substations

The substations described in this section are already operational. Alternative locations for these substations were not considered. The following describes their locations and the modifications proposed as part of the Gateway West Project.

3.2.2.1 Windstar Substation

The Windstar Substation is located on private lands approximately 3.5 miles east of Glenrock, Wyoming, and approximately 1 mile north of the Dave Johnston Power Plant (Appendix A, Figure A-16).

For the Gateway West Project, one new 230-kV line bay, including 230-kV circuit breakers and associated equipment, bus supports, high-voltage switches, transmission line termination structures, and 230-kV capacitors, will be added to the Windstar Substation to electrically terminate the new transmission line from the Aeolus Substation (Segment 1W[a]). Site development will disturb approximately 12 acres and 10 acres will be required for expansion of the existing fence line for operations.

A new control house will be added or the existing control house will be expanded and/or added to accommodate the necessary system communications and control equipment. The existing access road will be used to reach the site.

3.2.2.2 Dave Johnston Substation

The existing Dave Johnston Substation 230-kV yard (Segment 1W[c]) will be modified to match the proposed capacity of the transmission configuration, Replacement of existing 230-kV circuit breakers, high-voltage switches, tubular and wire bus, bus supports, and transmission line termination structures is required. No expansion of Dave Johnston Substation is proposed and all construction will take place within the existing substation fence. (Appendix A, Figure A-17).

3.2.2.3 Heward Substation

The Heward Substation will be developed immediately adjacent to the existing Difficulty Substation, which is located about 45 miles from Bessemer Bend and approximately 34 miles north of Medicine Bow, Wyoming, as shown on Appendix A, Figure A-18. Although operationally independent of the Difficulty Substation, it is in effect an expansion of an existing use. Heward comprises a new 230-kV yard to the west and immediately adjacent to the existing substation fenced area. The Heward 230-kV yard will be required because the existing 230-kV bus and other equipment within the Difficulty Substation is under-rated for accommodating the additional electrical capacity that will be added by rebuilding and reconductoring a portion of the existing Dave Johnston – Rock Springs 230-kV line between the Dave Johnston Power Plant and the planned Aeolus Substation (Proposed Route 1W(c). Adding the new 230-kV yard will increase the flow through capacity of the Difficulty 230-kV bus and also facilitate maintaining power to Difficulty Substation customers during construction.

Site development will disturb approximately 7 acres and 5 acres will be required for operations.

The new 230-kV yard includes 230-kV circuit breakers, high-voltage switches, bus supports, and transmission line termination structures. The 230-kV transmission line termination structures will be approximately 70 feet tall. A new control house will be constructed within the fenced area to accommodate the necessary system communications and control equipment in the new 230-kV yard. The 230-kV bus will be extended to interconnect to the existing Difficulty Substation 230-kV bus. The existing Difficulty Substation access road will be utilized on the current alignment and state highway entrance. Approximately 500 feet of additional roadway

will be developed adjacent to the northern substation fence line to provide alternative equipment access to the Difficulty Substation. The rebuilt Dave Johnston – Heward and Heward – Aeolus 230-kV lines will enter and exit the new substation yard from the north and south as shown in Appendix A, Figure A-19.

3.2.2.4 Shirley Basin Substation

The existing Shirley Basin 230-kV Substation will require replacement of existing 230-kV circuit breakers, high-voltage switches, tubular and wire bus, bus supports, and transmission line termination structures. No expansion of Shirley Basin Substation is proposed and all construction will take place within the existing substation fence (Appendix A, Figure A-19).

3.2.2.5 Jim Bridger 345-kV Substation

The existing Jim Bridger Power Plant has a separate 345-kV substation yard located east of the plant (Appendix A, Figure A-20). A 5.5-mile interconnecting 345-kV transmission line between the new Anticline Substation 500-kV yard and the existing Jim Bridger Substation 345-kV yard (Segment 3A) will be required to electrically connect the two substations. The Jim Bridger 345-kV yard will be expanded by about 10 acres to accommodate the line termination position.

Equipment to be installed within the fenced area includes 345-kV circuit breaker bays and associated equipment, bus supports, high-voltage switches, transmission line termination structures and relocated 345-kV capacitors.

3.2.2.6 Populus Substation

The existing Populus Substation (Figure A-21), located near the town of Downey, Idaho, will be expanded to accommodate the addition of the Gateway West 500-kV transmission lines (Appendix A, Figure A-1). A new 500-kV yard will be constructed in the expansion area north of the existing 345-kV substation yard and interconnected to the existing 345-kV station equipment through a new 500/345-kV transformer bank. Site development will disturb approximately 90 acres and 80 acres will be required for expansion of the existing fence line for operations. (Appendix A, Figure A-21). 500–kV transmission line bays will be installed for connection to the transformer bank and the termination of the three 500-kV line positions for lines to Anticline Substation (Segment 4), Borah Substation (Segment 5), and Cedar Hill Substation (Segment 7).

Each of the transformer and line bays contains high-voltage circuit breakers and switches, bus supports, and control equipment. A new 500/345-kV transformer bank, 500-kV reactors, and 500-kV capacitors will be installed within the fenced area. Transmission line termination structures, approximately 125 to 135 feet tall, will be installed to physically terminate the 500-kV conductors. A new control building will be constructed to house the 500-kV communications and control equipment. The existing access road will be used to reach the site.

3.2.2.7 Borah Substation

The existing Borah Substation is located near American Falls, Idaho (Appendix A, Figure A-8). Expansion of the existing substation requires expansion of the fenced area on private land to accommodate the new 500-kV facilities. Site development will disturb approximately 40 acres and 35 acres will be required for expansion of the existing fence line for operations. The existing Midpoint – Kinport 345-kV line, which currently bypasses the Borah Substation, will be reconnected into an existing 345-kV line bay at this substation and the remaining line segment to Midpoint Substation (Segment 6 – upgrade to 500 kV) and the 500-kV line from Populus Substation (Segment 5) will terminate in the new expansion area. The new 500-kV facilities will be connected to the existing station by the addition of a 500/345-kV transformer bank (Appendix A, Figure A-22).

Each of the transformer and line bays contains high-voltage circuit breakers and switches, bus supports, and control equipment. The new 500/345-kV transformer bank, 500-kV reactors, and 500-kV capacitors will be installed within the fenced area. Transmission line termination structures, approximately 125 to 135 feet tall, will be installed to physically terminate the 500-kV conductors. The existing control building will be enlarged and/or a new control building will be added to house the new 500-kV communications and control equipment. The existing access road will be used to reach the site.

3.2.2.8 Midpoint Substation

The existing Midpoint Substation is approximately 9 miles south of Shoshone, Idaho, on Highway 93 (Appendix A, Figure A-10). The Midpoint Substation will be expanded by 40 acres on private land to accommodate the new Gateway West 500-kV lines. The three 500-kV transmission lines from Hemingway Substation (Segment 8), Cedar Hill Substation (Segment 10), and Borah Substation (Segment 6) will terminate in the expansion area (Appendix A, Figure A-23).

Each of the transmission line bays contains high-voltage circuit breakers and switches, bus supports, and control equipment. New 500-kV reactors and 500-kV capacitors will be installed within the fenced area. Transmission line termination structures, approximately 125 to 135 feet tall, will be installed to physically terminate the 500-kV conductors. The existing control building will be enlarged and/or a new control building will be added to house the 500-kV communications and control equipment for the new Gateway West 500-kV transmission lines. The existing access road will be used to reach the site.

3.2.2.9 Hemingway Substation

The existing Hemingway Substation is located approximately 30 miles southwest of Boise, Idaho, just off of Highway 78 near Wilson Creek Cemetery, shown on Appendix A, Figure A-10 as the western terminus of Segment 8.

The Hemingway Substation has sufficient space planned within the existing fenced area to accommodate the two new 500-kV transmission line bays for Gateway West (Appendix A, Figure A-24). One bay will be for the 500-kV line from the Midpoint Substation (Segment 8) and one for the 500-kV line from the Cedar Hill Substation (Segment 9). Each of the transmission line bays contains high-voltage circuit breakers and switches, bus supports, and control equipment.

New 500-kV reactors and 500-kV capacitors will be installed within the fenced area. Transmission line termination structures, approximately 125 to 135 feet tall, will be installed to physically terminate the 500-kV conductors. The communications and control equipment for the Gateway 500-kV transmission lines will be housed within the existing control building. The existing access road will be used to reach the site.

3.3 Transmission Line Components

Regardless of the route or the structure type chosen, the construction, operation, maintenance, and decommissioning of the transmission line will be conducted as specified in this section. This section provides a general outline of the construction, operations, maintenance, and decommissioning of the transmission line, and references portions of Appendix B, which provides details on each component. Both this section and Appendix B are organized into four parts. The first part describes the components of the transmission line system, including the transmission line itself and its supporting structures, substations, and the communication system. The second part describes the construction techniques and addresses both the

permanent alterations and the temporary disturbances needed as well as providing a description of the construction workforce, equipment, and traffic. The third part describes the operations and maintenance of the new system, while the fourth part discusses decommissioning and restoration of the ROW.

3.3.1 System Components

The new transmission system is composed of the transmission structures themselves, the conductors, other hardware, the communications system, access roads, and substations. Each is summarized below and detailed in Appendix B.

3.3.1.1 Construction Disturbance and Land Requirements

Appendix B, Section 2.1.1 details the typical ROW land areas needed for the various components during construction and over the operational life of the Project.

3.3.1.2 Transmission Line System

Appendix B, Section 1.1 describes transmission structures, including their types and sizes, the clearances needed between phases of the system and between the lowest conductor and the ground surface, and their foundations. It goes on to describe the conductor types and the other hardware used. Both steel H-frames and lattice steel towers are detailed.

3.3.1.3 Communication System

To control the transmission line and manage the flow of electricity, a sophisticated communication system is required. This communication system's backbone is a fiber optic system contained within one of the overhead ground wires carried along the length of the transmission system. The fiber optic signal needs to be "boosted" or regenerated about every 55 miles along the system, requiring optical signal regeneration stations. These stations consist of a building 12 by 32 by 9 feet tall, a fenced yard, access road, and distribution power supply from the local distribution system. They are typically built close to the transmission line as land use and physical features allow. Details are found in Appendix B, Section 1.4.2.

3.3.1.4 Access and Service Roads

During construction vehicular access will be required to each structure. Appendix B, Section 1.5.1 specifies the typical access roads. New access roads will be constructed and existing roads widened as needed to provide a 14-foot-wide travel way. Roads not required for operations will be restored to their original condition or left as is, depending on landowner/land management agency requirements. Exact locations for roads will be developed during the detailed design phase. Preliminary design has provided indicative locations for roads and laydown yards along the entire ROW. These indicative locations have been used in geographic information system (GIS) analysis to develop the "disturbance footprint" of the Project. While the vast majority of the access roads to be used by the Project will be within the ROW requested, some access roads will be outside the ROW.

- Transmission line service roads are necessary for access to, and maintenance of, transmission lines, structures or ancillary facilities, but they are not part of the public or federal network of roads. They are generally closed to the public and will be maintained by the Companies and are detailed in Appendix B, Section 1.5.2. With few exceptions, construction access roads become service roads, although most will be used only infrequently to meet maintenance requirements. Service roads and structure construction pads will be revegetated but not recontoured.

3.3.1.5 Multi-Purpose Yards and Fly Yards

Appendix B, Sections 2.2.3 and 2.2.4 provide a general description for multi-purpose yards and fly yards. Exact locations for yards will be developed during the detailed design phase once the BLM has selected a preferred alternative, but preliminary design has provided indicative locations for roads and laydown yards along the entire ROW. These indicative locations have been used in GIS to develop the "disturbance footprint" of the Project. While the vast majority of the multi-purpose yards to be used by the Project would be within the ROW requested, some multi-purpose yards and most fly yards would be outside the ROW. Multi-purpose yards and fly yards are temporary disturbances or temporary uses of areas already developed for storage or other industrial uses.

3.3.1.6 Substations

The description of substations includes their access roads, the types of buildings, transformers, and other infrastructure needed to convert incoming voltage to either another long-distance transmission voltage or to a lower voltage appropriate for distribution to load centers nearby. Details of substation contents are found in Appendix B, Section 1.6.

3.3.2 System Construction

3.3.2.1 Transmission Line Construction

The installation of transmission structures requires preparation of each site where a structure will be installed, including vegetation removal and grading to obtain a relatively flat surface for the operation of the large cranes used to install the structures. Then, either the directly embedded H-frame structure holes need to be drilled or excavated to accept the two poles of each structure, drilled concrete piers are developed for each of three poles for angle structures for the 345-kV structures, or else four foundations for each of the four legs of the lattice steel towers must be established. Appendix B, Table B-2 describes in detail the ranges of foundation sizes, depths, and amounts of concrete needed for each. In addition to the general description of foundation installation, Section 2.5.1 of Appendix B discusses the procedures if rock is encountered and blasting is needed. After the holes are dug for H-frame installation or the foundations completed for the lattice steel towers, the structures are brought in either by truck or by helicopter. If ground transportation is used, cranes will be employed for lifting and installing the structures. Structures are assembled at fly yards if helicopters are used (see also Section 2.5.2 of Appendix B specifying helicopter use procedures).

After the structures are assembled and in place, the conductors and the overhead ground wires will be strung from tower to tower. This is generally accomplished using a helicopter but may be conducted from the ground if the access road travels directly between towers. Details are found in Section 2.2.8 of Appendix B.

3.3.2.2 Communication Systems

Construction of the fiber optic "backbone" of the communication system will be accomplished at the same time as the conductors are strung. Regeneration station construction is also detailed in Section 2.3.1 of Appendix B.

3.3.2.3 Substation Construction

Appendix B, Section 2.4 provides details of substation construction, including development of all-weather access roads, staging areas, clearing and grading of the site, establishment of grounding mats and systems, fencing, foundation excavation, structure and equipment

installation, oil containment system installation, control building installation, and finally cleanup and landscaping.

3.3.2.4 Construction Elements

Section 2.6 in Appendix B concludes by providing details of the construction workforce to be employed, the construction equipment and likely daily traffic patterns during the peak of construction, and the proposed construction schedule. Removal of temporary facilities and waste disposal are also discussed.

3.3.3 Operations and Maintenance

The Companies have prepared Project-specific operations and maintenance policies and procedures designed to meet the requirements of the NERC, WECC, and the state public utility commissions, while remaining in compliance with the applicable codes and standards with respect to maintaining the reliability of the electrical system. Operations and maintenance activities include transmission line patrols, climbing inspections, tower and wire maintenance, insulator washing in selected areas as needed, service roads repairs. Periodic inspection and maintenance is also a key part of operating and maintaining the electrical system. The following key topics are described in detail in Appendix B, Section 3.0:

- Routine system inspection, maintenance, and repair;
- Transmission line maintenance;
- Hardware maintenance and repairs;
- Service road and work area repair;
- Vegetation management; and
- Substation and regeneration site maintenance.

3.3.4 Decommissioning

The projected life of the Gateway West Project is 50 years. Typically, transmission lines that have been maintained through that period will continue to provide service for a much longer lifetime. At the end of the service life of the Project, assuming that it is not upgraded or otherwise kept in service, the structures and conductors would be removed. The substations and regeneration stations, if not needed for other existing transmission line projects, would also be removed. Appendix B, Section 4.0 provides information regarding the removal of materials and the restoration of the sites.

4.0 ENVIRONMENTAL PROTECTION PLANS

This section describes the framework plans included as appendices to this POD that the Companies will use to ensure environmental protection during construction, operation, and maintenance. Each plan will include environmental protection measures (EPMs). These measures have been developed by the Companies to maintain environmental quality and meet requirements of various agencies. For the purposes of ongoing review and discussion with agencies, the measures will be submitted separately. Once the measures are finalized, they will be incorporated into individual plans. The Companies will be responsible to ensure their contractors and employees will implement these measures. Table 4-1 describes the framework plans.

Table 4-1. Environmental Protection Plans

Framework Plan	Preliminary Plan or Environmental Protection Measures	Final Plan
The **Environmental Compliance Management Plan** will be the primary guidance document that states how the Companies will uphold, document, and manage compliance with the right-of-way grant, the POD, landowner agreements, and all federal, state, and local permits. It is a centralized Project environmental compliance reference and is thereby intended to facilitate environmental compliance across the entire Project.	Included in POD as Appendix C.	Construction POD and COM Plan
The **Framework Reclamation Plan** will include site-specific construction mitigation, reclamation, and revegetation measures for each land management area crossed by the ROW within BLM-managed and National Forest lands. It will combine the Companies' BMPs with site-specific mitigation developed in consultation with agencies. Some measures will apply Project-wide, while others will be designed for specific areas.	Included in POD as Appendix D. Environmental protection measures (EPMs) provided in Appendix Z.	Construction POD and COM Plan
The **Framework Noxious Weed Plan** will provide methods to control the potential occurrence/infestation of noxious and invasive weeds during and following construction of the Project. The purpose of the plan is to ensure noxious weeds are identified and controlled during the construction of project facilities and all federal, state, county, and other local requirements are satisfied.	Included in POD as Appendix E. EPMs provided in Appendix Z.	Construction POD and COM Plan
The **Framework Stormwater Pollution Prevention Pl**an will include measures for temporary and permanent erosion and sediment control that will be used during construction, operation, and maintenance of the transmission line and ancillary facilities.	Included in POD as Appendix F. EPMs provided in Appendix Z.	Construction POD and COM Plan
The **Framework Spill Prevention, Containment, and Countermeasures Plan** will include measures for spill prevention practices, requirements for refueling and equipment operation near waterbodies, procedures for emergency response and incident reporting, and training requirements.	Included in POD as Appendix G. EPMs provided in Appendix Z.	Construction POD and COM Plan
The **Framework Plant and Wildlife Conservation Measures Plan** will present the measures proposed by the Companies for avoidance and minimization of impacts to special status plant and wildlife species as related to construction activities for the Project and outlines specific conservation measures to be implemented in the event that state or Federally listed species, BLM sensitive species, or Forest Service special status species or their habitats are identified within or adjacent to the Project right-of-way.	Included in POD as Appendix H. EPMs provided in Appendix Z.	Construction POD and COM Plan

Table 4-1. Environmental Protection Plans (continued)

Framework Plan	Preliminary Plan or Environmental Protection Measures	Final Plan
The **Framework Stream, Wetland, Well, and Spring Protection Plan** will provide measures to protect these resources from potential impacts during construction, operation, and maintenance activities. The goals of this plan are to control Project-related erosion and sedimentation into streams and wetlands and minimize disturbance and erosion of streambeds and banks and protect springs and wells in the Project area from impacts due to blasting and hazardous materials contamination.	Included in POD as Appendix I. EPMs provided in Appendix Z.	Construction POD and COM Plan
The **Framework Paleontological Resources Protection Plan** will identify the mitigation measures needed to avoid or reduce project-related impacts to paleontological resources, wherever feasible. This plan provides important background and contextual information useful for the paleontological resources mitigation program.	Included in POD as Appendix J. EPMs in Appendix Z.	Construction POD and COM Plan
The **Framework Agricultural Protection Pl**an will include measures intended to mitigate or provide compensation for agricultural impacts that may occur due to construction of the Project. The measures will be intended to be implemented on partially or wholly owned private agricultural land unless directed otherwise by the landowner. Agricultural land will be defined to include that which is annually cultivated or rotated cropland; land in perennial field crops, improved pasture; hayfields; and land in the Conservation Reserve Program.	Included in POD as Appendix K. EPMs provided in Appendix Z.	Construction POD and COM Plan
The **Framework Traffic and Transportation Management Plan** will include measures that require compliance with federal policies and standards relative to planning, siting, improvement, maintenance, and operation of roads for the Project.	Included in POD as Appendix L. EPMs provided in Appendix Z.	Construction POD and COM Plan
The **Framework Blasting Plan** will outline methods to prevent adverse impacts to human health and safety, property, and the environment that could potentially result from the use of explosives during project construction and mitigate risks and potential impacts associated with blasting procedures that may be required for construction. The plan will provide all levels of construction personnel project-specific information concerning blasting procedures, including the safe use and storage of explosives.	Included in POD as Appendix M. EPMs provided in Appendix Z.	Construction POD and COM Plan
The **Framework Dust Control and Air Quality Plan** will provide measures to ensure protection of the air quality that will be affected by the Project. This plan is to be implemented during the construction, operation, and maintenance phases of the Project. These measures are intended to minimize dust and emissions from construction-related activities.	Included in POD as Appendix N. EPMs provided in Appendix Z.	Construction POD and COM Plan
The **Framework Fire Prevention and Suppression Plan** will include measures to be taken by the Companies and its contractors to ensure that fire prevention and suppression measures are carried out in accordance with federal, state, and local regulations. The plan will address the specific requirements of the Forest Service and BLM handbooks and provide BMPs for fire management on privately owned lands..	Included in POD as Appendix O. EPMs provided in Appendix Z.	Construction POD and COM Plan
The **Framework Hazardous Material Management Plan** will reduce the risks associated with the use, storage, transportation, production, and disposal of hazardous materials (including hazardous substances and wastes). This Plan will identify Project-specific mitigation measures and other specific stipulations and methods to address spill prevention, response, and cleanup procedures for the Project.	Included in POD as Appendix P. EPMs provided in Appendix Z.	Construction POD and COM Plan

Table 4-1. Environmental Protection Plans (continued)

Framework Plan	Preliminary Plan or Environmental Protection Measures	Final Plan
The **Framework Construction Emergency Preparedness and Response Plan** will provide an overview of methods to be implemented if the need for emergency management is imminent. This document will the existing support structure, chain of command, and emergency communications protocols to be used as a guide for an Emergency Preparedness and Response Plan to be completed by the Construction Contractor	Included in POD as Appendix Q. EPMs provided in Appendix Z.	Construction POD and COM Plan
The **Framework Operations, Maintenance, and Emergency Response Plan** will include measures to be employed while conducting routine, corrective, and emergency operations and maintenance activities. Measures identified will be in compliance with applicable state and federal laws and policies; ensure consistency across and within federal jurisdictions; and allow for the Companies to access the transmission line and ancillary facilities in a timely, cost effective, and safe manner.	Included in POD as Appendix R. EPMs provided in Appendix Z.	Construction POD and COM Plan
The **Cultural Resources Protection and Management Measures** will include the procedures undertaken to inventory, evaluate, and protect cultural resources. It describes the treatment of any eligible or listed resource that cannot be avoided, and procedures for handling inadvertent discoveries during construction, operation, and maintenance.	General EPMs provided in Appendix Z. Final measures will be based on the Programmatic Agreement and the Historic Properties Treatment Plan.	Construction POD and COM Plan

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