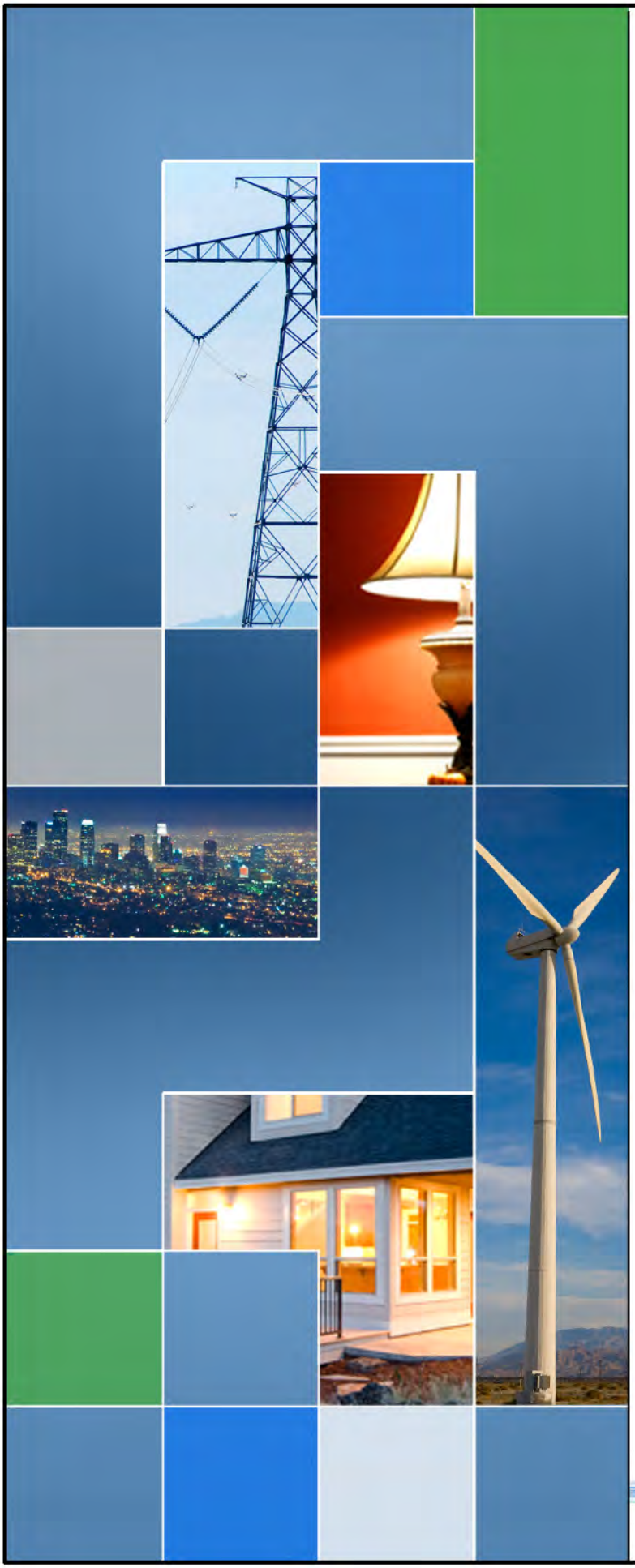

TransWest Express Transmission Project

Preliminary Plan of Development

Amended from January 2009

Submitted by

TRANSWEST EXPRESS LLC

Submitted to

NATIONAL SYSTEM OF PUBLIC LANDS

Wyoming State Office

July 2010

PRELIMINARY PLAN OF DEVELOPMENT

Amended from January 2009

TransWest Express Transmission Project

Prepared for:

U.S. Department of the Interior
Bureau of Land Management

Prepared by:

TransWest Express LLC

July 2010

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LIST OF ACRONYMS

AC	alternating current
ACC	Arizona Corporation Commission
BLM	Bureau of Land Management
BMP	Best Management Practices
CARB	California Air Resources Board
CEC	California Energy Commission
COM Plan	Construction, Operation and Maintenance Plan
CPUC	California Public Utilities Commission
DC	direct current
DOE	Department of Energy
DR	distributed renewable
EHV	extra high voltage
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
GHG	Greenhouse Gas
GWh/yr	Gigawatt hours per year
IPP	Intermountain Power Project
kcmil	thousand circular mils
kV	kilovolt
LP	liquefied petroleum
MW	megawatt
NEPA	National Environmental Policy Act of 1969
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
NREL	National Renewable Energy Lab
OPGW	optical ground wire
POD	Plan of Development
REC	renewable energy credits
RES	Renewable Energy Standards
RMP	Resource Management Plan
RPS	Renewable Portfolio Standards
ROD	Record of Decision
ROW	Right-of-Way
SCADA	Supervisory Control and Data Acquisition
SUP	Special Use Permit
TWE	TransWest Express
UHF	ultra high frequency
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USFS	United States Forest Service
VHF	very high frequency
WECC	Western Electricity Coordinating Council
Western	Western Area Power Administration
WWEC	WestWide Energy Corridors

SECTION 1.0 - INTRODUCTION

1.1 BACKGROUND

This amended Preliminary Plan of Development (POD) has been prepared by TransWest Express LLC (TWE/the Applicant) in support of applications to the U.S. Department of the Interior (USDI) Bureau of Land Management (BLM) for authorization to use federal lands for the construction, operation, and maintenance of the TransWest Express Transmission Project (TWE Project or Project). The TWE Project is a proposed, extra-high voltage (EHV) direct current (DC) transmission system extending between south-central Wyoming and southern Nevada. The TWE Project will provide the transmission infrastructure and capacity necessary to reliably and cost-effectively deliver approximately 3,000 megawatts (MW) of electric power from renewable energy resources in south-central Wyoming to markets in the Desert Southwest region. For the purposes of the TWE Project, the Desert Southwest region consists of Arizona, Nevada, and southern California.

The BLM and the U.S. Department of Energy (DOE), Western Area Power Administration (Western) are joint federal lead agencies for the Environmental Impact Statement (EIS) being prepared for the TWE Project, in compliance with the National Environmental Policy Act (NEPA) of 1969. In addition to the BLM and Western, a number of federal, state and local agencies are participating in the NEPA process as cooperating agencies.

This amended Preliminary POD contains initial engineering design information and Applicant proposed environmental mitigation measures, which are part of the proposed TWE Project description. The POD is considered a "living document" which will be periodically updated during the progression of the TWE Project through the NEPA process. A final POD will be prepared by TWE following the completion of the Final EIS and the issuance of Records of Decisions (RODs) by the BLM, Western, and other federal permitting agencies. The final POD will reflect the agencies' approved route and agency-required mitigation measures and permitting stipulations. Prior to construction, a Construction, Operation and Maintenance Plan (COM Plan) will be prepared which will incorporate the final POD and the completed engineering and design of the TWE Project (e.g., construction, operation, and maintenance specifications, disturbance areas, access routes, etc.). The COM Plan will be submitted to the BLM for review and approval, prior to BLM's issuance of the ROW grant and notice to proceed.

TWE has conducted system planning and corridor feasibility studies to identify the TWE Project proposed transmission line route (Applicant proposed corridor), which conforms to federally designated utility corridors and parallels existing transmission lines or pipelines, to the extent practical. The proposed TWE Project transmission corridor is shown on Figure 1. This figure illustrates the locations of the proposed corridor and other alternative corridors, currently being considered by the BLM as part of the NEPA process.

1.2 POD ORGANIZATION

The amended Preliminary POD describes the TWE Project according to the following topics:

- Section 2 – Purpose and Need
- Section 3 – TWE Project Description
- Section 4 – TWE Project Construction
- Section 5 – TWE Maintenance and Operation
- Section 6 – TWE Preliminary Committed Environmental Mitigation Measures
- Section 7 – Authorization, Permits, and Reviews

Figure 1 – TWE Project - Proposed and Alternative Corridors (June 2010)

[Figure 1-next page]

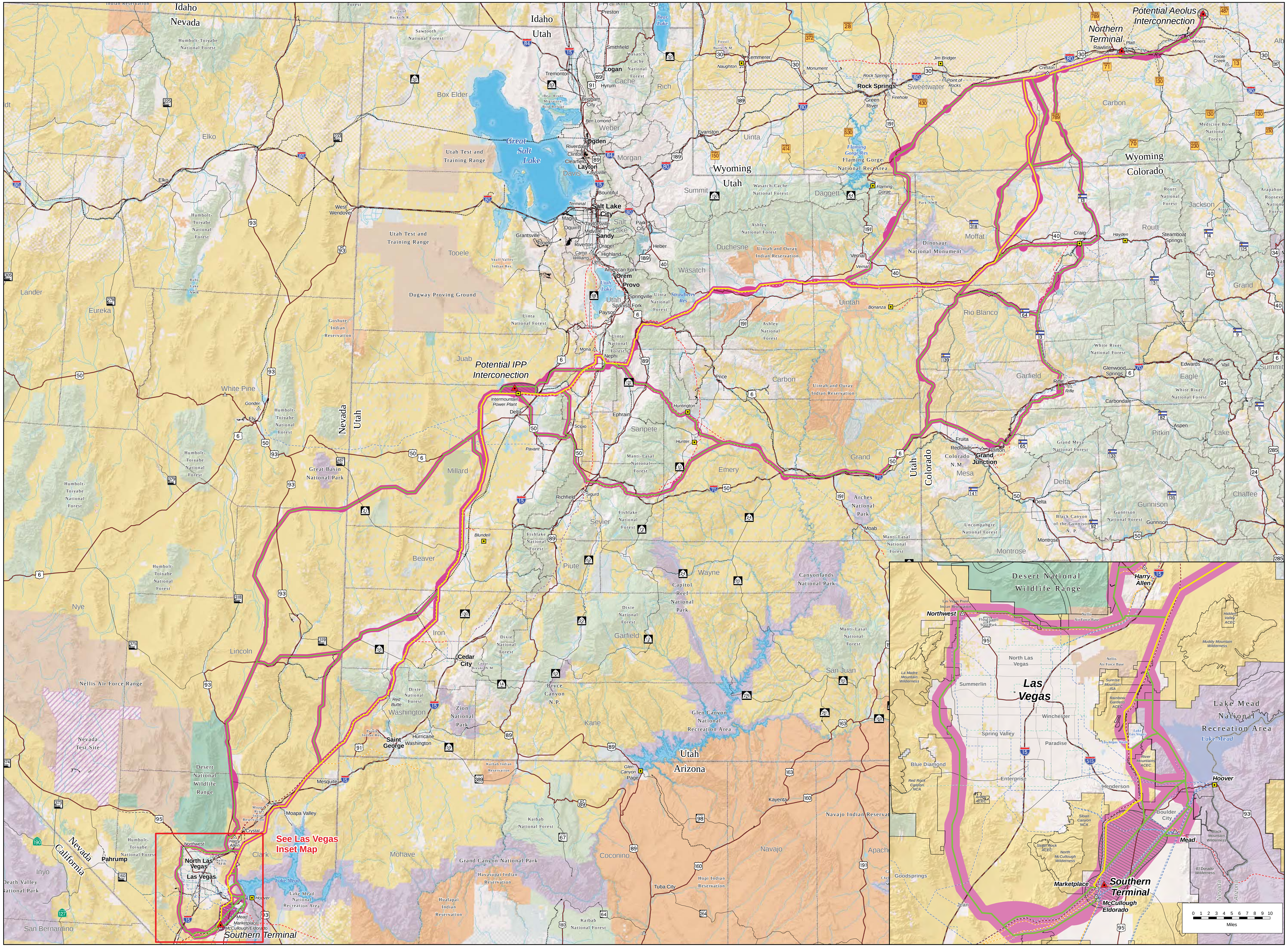


FIGURE 1

PROPOSED AND ALTERNATIVE CORRIDORS

Legend

Project Features

- Proposed Segment
- Alternative Segment
- Proposed & Alternative Corridors (Typical two miles wide)
- Proposed Substation/ Terminal
- Terminal Siting Area

Land Jurisdiction

- Department of Defense
- Department of Energy
- Indian Reservation
- USDA Forest Service
- USDI Bureau of Land Management
- USDI Bureau of Reclamation
- USDI Fish and Wildlife Service
- USDI National Park Service
- State Land
- State or Local Park
- Private Land

Existing Utilities

- Existing Power Plant
- Existing Substation
- 500kV+/- DC Transmission Line
- 500kV Transmission Line
- 345kV Transmission Line
- 230 to 287kV Transmission Line
- 138 to 161kV Transmission Line
- 115kV Transmission Line

Transportation Features

- Interstate Highway
- US Highway
- State Highway
- Railroad

Water Features

- River or Stream
- Lake, Pond, or Reservoir

Data Sources

Transportation:
NTAD2008, US Department of Transportation
Land Jurisdiction:
BLM State Office California, Colorado, Idaho, New Mexico, Oregon, Utah, Wyoming 2008
POWERmap, powermap.platts.com
©2007 Platts, A Division of The McGraw-Hill Companies

NOTE: Substation locations are schematic and do not necessarily represent precise locations.

Date updated: June 29, 2010
Routes Current as of June 23, 2010

The routes shown on this map are preliminary and may be revised and/or refined throughout the development of the project.

0 10 20 30 40 50 60 70 80
Miles
1:800,000

TRANSWEST EXPRESS TRANSMISSION PROJECT

POWER ENGINEERS
June 29, 2010

TRANSWEST EXPRESS LLC

SECTION 2.0 – PURPOSE AND NEED

2.1 TWE PROJECT OBJECTIVES AND NEEDS

The primary purpose of the TWE Project is to provide the transmission infrastructure and capacity necessary to reliably and cost-effectively provide up to 3,000 MW of electric power capacity from Wyoming to the Desert Southwest.

The TWE Project objectives are to:

- allow consumers access to renewable energy sources and contribute to meeting national, regional and state energy and environmental policies, including state mandated renewable portfolio and greenhouse gas reduction targets
- meet increasing customer demand with improved electrical system reliability
- allow consumers access to domestic energy sources and contribute to complying with national energy policy
- provide system flexibility and increased access to the grid for the third party transmission users
- expand regional economic development through increased employment and enlargement of the property tax base
- maintain the standard of living associated with highly reliable electricity service

In order to meet these broad objectives, the TWE Project has the following project-specific purposes and needs:

- Provide for the efficient, cost-effective, and economically feasible transmission of approximately 20,000 gigawatt hours per year (GWh/yr) of clean and sustainable electric energy from Wyoming to markets in the Desert Southwest region.

- Meet North American Electric Reliability Corporation (NERC) Reliability Standards and Western Electricity Coordinating Council (WECC) planning criteria and line separation requirements.

- Maximize the use of existing and designated utility corridors and access roads in order to minimize environmental and social effects of the TWE Project to the extent practical.

- Provide these benefits to the Desert Southwest region and the broader Western United States in a timely manner to meet the regions pressing environmental and energy needs. TWE has identified a need for the TWE Project by the expected in service date of 2015 or as soon as the regulatory reviews can be completed.

- Provide for flexibility and maximize the use of transmission capacity that may become available by configuring the TWE Project to allow for future interconnection with the Intermountain Power Project (IPP) transmission system near Delta, Utah.

2.2 NERC STANDARDS AND WECC CRITERIA FOR TRANSMISSION RELIABILITY AND LINE SEPARATION

The TWE Project is a proposed 600 kilovolt (kV) DC transmission line which will require a 250 foot-wide ROW across public lands. However, increased right-of-width may be required in a small number of site specific locations to accommodate rough terrain or unusually long spans.

Transmission systems in the United States are planned, operated, and maintained to meet guidelines of NERC. Additionally, transmission owners and operators are governed by WECC criteria that may be in addition to or more stringent than those required by NERC. These reliability standards affect the TWE Project ROW requirements and separation requirements from other high voltage lines.

Reliability standards limit the operational capacity of any single transmission system element based on a complex contingency analysis that considers the impact to system operations following various events (i.e., equipment failures, line outages, etc.). As a single transmission system element, the TWE Project is effectively limited in capacity to approximately 3,000 MW.

In addition, WECC requires a minimum separation between high voltage transmission lines. The WECC criteria specifies that in order to avoid rating as adjacent circuits, or common transmission system elements, circuits must be 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" (WECC2008b).[1] TWE has completed preliminary system analysis and determined that the tower span separation is required between the TWE Project and all other 500 kV transmission lines. For purposes of the initial TWE Project siting studies, the longest span was assumed to be 1,500 feet, thereby dictating the minimum distance between the TWE Project and other 500 kV and above existing, planned, and proposed transmission lines.[2] For the 345 kV and lower voltage circuits the TWE Project can be placed within a tower span of one another. The minimum separation required between the TWE Project and these 345 kV and smaller transmission lines is 300 feet. This separation distance is based on tower height and is required to prevent a failed transmission structure or line from falling into the adjacent transmission line.[3]

At 3,000 MW, the TWE Project will be one of the largest transmission system elements within the WECC system. Simultaneous loss of two such major transmission elements can cause a multiple-state blackout. Preliminary transmission system contingency analysis indicates that a simultaneous loss of two major transmission lines that interconnect in the relatively weak Wyoming transmission grid could lead to a widespread system outage. Prudent transmission system design dictates that system reliability is enhanced through reducing the probability that any event (i.e., winter storm, fire, tornado, avalanche, airplane crash) would lead to such a loss. Therefore, for the TWE Project and other planned major transmission projects with interconnections in Wyoming, a separation distance greater than the 1,500-foot minimum cited above for as much of the length of the lines as feasible represents prudent transmission system design.

2.3 RENEWABLE ENERGY AND TRANSMISSION

The TWE Project will provide the transmission infrastructure and capacity necessary to reliably and cost-effectively deliver approximately 20,000 GWh/yr of clean and sustainable electric power generated primarily from renewable wind energy resources in Wyoming to the Desert Southwest. Another major benefit of the TWE Project is to facilitate the states of the Desert Southwest in their ability to meet their renewable energy needs and Renewable Portfolio Standards (RPS).

Wind and solar have been cited in numerous studies as the most economic large scale resources that can be used to meet the Nation's demand for renewable and clean energy. However, developable solar and wind resources are typically found in remote areas located far from urban centers where the demand is the greatest. Thus, transmission infrastructure is required to enable renewable energy development that will meet both the demand for energy and environmental policy objectives.

In its July 2008 report entitled "20% Wind Energy by 2030, Increasing Wind Energy's Contribution to U.S. Electricity Supply", the DOE recognized the challenge of bringing wind energy to market.[4] According to the DOE report:

> "If the considerable wind resources of the United States are to be utilized, a significant amount of new transmission will be required. Transmission must be recognized as a critical infrastructure element needed to enable regional delivery and trade of energy resources, much like the interstate highway system supports the nation's transportation needs…Significant expansion of the transmission grid will be required under any future electric industry scenario. Expanded transmission will increase reliability, reduce costly congestion and line losses, and supply access to low-cost remote resources, including renewables."

In discussing required improvements to the nation's transmission infrastructure necessary to achieve 20% wind energy by 2030, the DOE report concludes:

> "The 20% Wind Scenario would require widespread recognition that there is national interest in ensuring adequate transmission. Expanding the country's transmission infrastructure would support the reliability of the power system; enable open, fair, and competitive wholesale power markets; and grant owners and operators access to low-cost resources. Although built to enable access to wind energy, the new transmission infrastructure would also increase energy security, reduce GHG emissions, and enhance price stability through fuel diversity."

The electrical demand for the Desert Southwest region is also expected to increase over the next 14 years. According to the U.S. Census Bureau, the western United States has experienced a population growth of approximately 10 percent from 2000 to 2006. The Bureau expects the growth in population to increase by 33 percent between 2006 and 2030. The Bureau's latest projection of population growth between 2000 and 2030 for the combined area of Arizona, California, and Nevada is nearly 50 percent.[5] Arizona and Nevada were identified as the fastest growing states during this period.[6]

Population increase is a key driver in the projected increase in electrical demand, although it is not the only factor. The amount of electricity used per person is also expected to increase as the scope and expectation for the uses of electricity increases. The per capita increase is due to the continued electrification of day to day life, including the expanded deployment of air conditioning, computers, high-definition televisions, and potentially, electric powered automobiles. While this upward tendency on per capita electricity usage is countered by conservation efforts in the form of energy efficiency standards, utility programs, and individual responsibility, overall per capita electricity usage is still expected to increase.[7] Therefore, even accounting for conservation programs, the electricity demand is expected to increase on the order of 2 percent per year in the Desert Southwest region. [2]

The increase in overall forecasted electric demand in the Desert Southwest region will require the addition of 55,000 GWh/yr of renewable energy by 2020 to satisfy projected RPS requirements. Even

with significant gains in energy efficiency and/or slower than expected growth, the need to access new renewable resources remains. For instance, if overall demand for electricity is 15 percent below the forecasted levels for 2020, the estimated requirements for additional renewable energy would only change from 55,000 GWh/yr to 45,000 GWh/yr.[2]

2.3.1 Relevant State Laws and Regulations – Renewable Energy Resources and Standards

Arizona, California, Nevada, and Utah have adopted renewable energy standards, commonly referred to as Renewable Portfolio Standards (RPS). These states have enacted legislation that requires utilities to meet a portion of the overall customer energy supply with renewable energy resources by specific dates. Each state has adopted programs that vary in the portion of overall renewable energy required, the deadlines, and the type of resources that can be utilized. Beyond the legislated RPS, California, which has a 20 percent renewable energy requirement by 2010, has recently adopted a policy to increase the requirement to 33 percent by 2020. A brief summary of each state's RPS requirements follows.

California. California's RPS was initially established by the State of California legislature in 2002. Subsequent amendments to the law resulted in a requirement for California's investor-owned electric utilities to increase their sales of eligible renewable-energy resources by at least 1 percent of sales per year, with a standard of 20% of sales being derived from eligible renewable energy resources by 2010.

On September 15, 2009, the governor signed Executive Order S-21-09, which increased the requirement to 33% by 2020, and made the requirement apply to all utilities, including publicly-owned municipal utilities.

Prior to this Executive Order, the California Public Utilities Commission (CPUC) and the California Energy Commission (CEC) were responsible for implementing and overseeing the RPS. The Executive Order shifted that responsibility to the California Air Resources Board (CARB), which must adopt regulations by July 31, 2010. The CEC and CPUC are expected to serve in advisory roles to help the CARB develop the regulations to administer the 33% by 2020 requirement. Additionally, the CEC and the CPUC will continue their implementation and administration of the 20% requirement. The Executive Order also stipulates that the CARB may delegate to the CPUC and the CEC any policy development or program implementation responsibilities that would reduce duplication and improve consistency with other energy programs. The CARB is also authorized to increase the target and accelerate and expand the timeframe.

Arizona. In November 2006, the Arizona Corporation Commission (ACC) adopted final rules to expand the state's Renewable Energy Standard (RES) to 15% by 2025. In June 2007, the state attorney general certified the rule as constitutional, allowing the new rules to go forward and they took effect 60 days later. Investor-owned utilities serving retail customers in Arizona are subject to the standard.

Utilities subject to the RES must obtain renewable energy credits (RECs) from eligible renewable resources to meet 15% of their retail electric load by 2025 and thereafter. Of this percentage, 30% (i.e., 4.5% of total retail sales in 2025) must come from distributed renewable (DR) resources by 2012 and thereafter.

Nevada. Nevada established a RPS as part of its 1997 restructuring legislation. Under the standard, NV Energy (parent company of Nevada Power, Sierra Pacific Power, and Sierra Pacific Resources) must use eligible renewable energy resources to supply a minimum percentage of the total electricity it sells. In 2001, the state increased the minimum requirement by 2% every two years, culminating in a 15% requirement by 2013. The portfolio requirement has been subsequently revised, most recently by SB 358

of 2009, which increased the requirement to 25% by 2025. In addition to solar, qualifying renewable energy resources include biomass, geothermal energy, wind, certain hydropower, and waste tires (using microwave reduction).

2.3.2 Greenhouse Gas Reduction Goals

In addition to RPS mandates, states and the federal government are also considering various Greenhouse Gas (GHG) reduction policies. Several western governors, including the governors of California, Arizona, and Utah, formed the Western Climate Action Initiative in 2007 to jointly reduce regional GHG levels. A regional goal has been established by the members of the Initiative and details of the economy-wide (e.g., electricity, transportation, industry, etc.) program is being developed. GHG reduction policies are also being considered at the federal level. This need for additional renewable energy could be greater depending on how GHG reduction is implemented by utilities.[2 4]

2.3.3 Wyoming's Abundant and Cost Effective Resources

According to the National Renewable Energy Lab (NREL), Wyoming has one of the densest concentrations of high class wind energy potential in the country.[8 9] NREL data shows that over 50 percent of the best quality (Class 6 and 7) wind capacity in the continental United States is located in Wyoming. This Class 6 and 7 wind resource has an energy potential of 235,000 GWh/yr. Wyoming's Class 4 and above wind resource has a potential of 944,000 GWh/year. Wind and other energy developers have been very active in Wyoming.

The existing transmission capacity available to export electric energy from Wyoming is fully committed. These constraints led to the recommendations for transmission expansion along similar routes as the TWE Project from the Western Governors Association, the Rocky Mountain Area Transmission Study[10], and the Clean and Diversified Energy Advisory Committee.[11] In addition to wind resources, Wyoming has a number of other natural energy resources that could also be developed for production of electricity and transmitted on the infrastructure to be constructed pursuant to the TWE Project to the growing markets in the Desert Southwest region. The Western Governors Association and U.S. Energy Department have identified over 14,000 MW of high quality developable wind resources within Wyoming.[12]

Two recent studies, one by the Western Electricity Industry Leaders, have looked specifically at regional renewable energy alternatives, including remote resources supplied through new transmission infrastructure, to meet the needs of the Desert Southwest region. Wyoming wind resources was identified as one of the most economic alternatives to meet a portion of the overall needs.[8 9] The TWE Project will cost effectively provide up to 20,000 GWh/yr of the estimated 55,000 GWh/yr need for renewable energy need in the Desert Southwest region.

SECTION 3.0 – PROJECT DESCRIPTION

3.1 PROJECT OVERVIEW

The TWE Project will entail the construction and operation of a 600 kV DC transmission line and two alternating current/direct current (AC/DC) converter stations - a Northern AC/DC Converter Station to be located near Sinclair, Wyoming and a Southern AC/DC Converter Station to be located at the Marketplace Hub in the Eldorado Valley, approximately 15 miles south of Boulder City, Clark County, Nevada. The 600 kV DC transmission line will provide for a potential interconnection with the IPP transmission system in Millard County, Utah as well.

In its entirety, the TWE Project will consist of the following facilities and improvements:

- A 600 kV DC transmission line, approximately 725 miles in length, extending across public and private lands in Wyoming, Colorado, Utah and Nevada.

- Two AC/DC converter stations, each approximately 200 acres in size, to be located on private lands at either end of the 600 kV transmission line, near Sinclair Wyoming and at the Marketplace Hub in the Eldorado Valley, approximately 15 miles south of Boulder City, Nevada.

- Access routes, including improvements to existing roads, new overland access and new unpaved roads; to access the proposed Project facilities and work areas during the construction, operation and maintenance phases of the TWE Project.

- Ancillary facilities including:

  - Approximately 12 to 15 fiber optics communication and regenerative sites, to be located within the transmission line ROW.

  - Two (2) ground electrode facilities, each approximately 600 acres in size, to be located on private lands in Wyoming and Nevada. The northern ground electrode facility will be within 10 to 15 miles of the Northern AC/DC Converter Station; and the southern ground electrode facility will be within 50 to 100 miles of the Southern AC/DC Converter Station.

3.1.1 600 kV DC Transmission Line Location

The TWE Project transmission line will be approximately 725 miles long, and will follow federally designated utility corridors for approximately 393 miles. Figure 1 shows the location of the proposed TWE Project corridor and identifies where the transmission line would parallel existing utility lines. Federally designated corridors, identified on Figure 1, include corridors designated: (1) by the Department of Energy in November 2008 as WestWide Energy Corridors (WWEC) pursuant to Section 368 of the Energy Policy Act; and (2) by the Bureau of Land Management (BLM) and the United States Forest Service (USFS) in their respective land management plans (various dates). As a result of following these federally designated corridors, the TWE Project also crosses 171 miles of private and state lands, which provide connection to the designated corridors because of their proximity to the federal lands with these designations. Additional segments totaling approximately 120 miles do not fall in the previous

categories, but parallel existing utility lines. Only 41 miles of the TWE Project's proposed route would establish a new utility corridor.[1]

The TWE Project 600 kV DC transmission line will start at the Northern AC/DC Converter Station, southwest of the Town of Sinclair in Carbon County, Wyoming. The proposed transmission line route parallels the Interstate 80 corridor west towards Wamsutter and Creston Junction. The proposed route then turns south following the Sweetwater County and Carbon County lines towards Colorado. The proposed route continues into Colorado turning southwest near Maybell, Elk Springs, and Dinosaur (Moffat County) towards Utah. The proposed route turns west into Utah and continues south of Vernal (Uintah County), continuing west near Roosevelt (Duchesne County), continuing near the Uintah and Ouray Indian reservation. The proposed route then turns southwest near Strawberry Reservoir and continues towards Thistle (Utah County). At Thistle, the proposed route turns southwest toward Nephi (Juab County), then turns west near Nephi, continuing southwest towards Leamington (Millard County), where it turns west past Sugarville (Millard County). In Millard County, the 600 kV line will be routed to facilitate interconnection with the IPP transmission system near Delta, Utah in order to provide future flexibility for transmitting available renewable energy resources through this existing transmission facility.

Near Delta, Utah, the proposed TWE Project transmission line route turns south towards Black Rock (Millard County), and continues past Milford (Beaver County) towards Newcastle (Iron County). The proposed route then turns southwest towards Veyo and Gunlock (Washington County) and continues across Utah into Nevada (Lincoln County). The proposed route continues in a southwesterly direction towards Glendale and Moapa (Clark County) between the Moapa River Indian Reservation and the Valley of Fire State Park, and then continues south towards Las Vegas. The proposed route continues south along the eastern edge of Las Vegas towards Boulder City (Clark County) and terminates approximately 15 miles south of Boulder City, at a proposed Southern AC/DC Converter Station to be located in the Eldorado Valley, at the Marketplace Hub.

3.1.2 AC/DC Converter Stations Locations

The two AC/DC converter stations will each be approximately 200 acres in size. The Northern AC/DC Converter Station will consist of a 600 kV DC substation, a converter building containing power electronics and control equipment, a 230 kV substation and a 500 kV substation. The facilities will be located on private lands in Carbon County, Wyoming, approximately 2.5 miles southwest of the town of Sinclair, Wyoming. The Northern AC/DC Converter Station will be interconnect to the existing 230 kV line located within a mile of the converter terminal and the planned Gateway West 500 kV transmission line and ultimately one of the planned Gateway South 500 kV transmission lines being developed by PacifiCorp. The Southern AC/DC Converter Station will consist of a 600 kV DC substation, a converter building containing power electronic and control equipment and a 500 kV Substation, to be located in the Eldorado Valley on private land, approximately 15 miles south of Boulder City, in Clark County, Nevada. The Southern AC/DC Converter Station will interconnect to three of the four existing 500 kV substations located at the Marketplace Hub. These four substations include the Eldorado, Marketplace, Mead, and McCullough substations. The location and the specific interconnection between the TWE Project's Southern AC/DC Converter Station and the existing substations have not been proposed at this time. Figure 1 shows the general proposed locations for these facilities.

[1]New utility corridors are defined as those segments of the proposed project would are not within a federally designated corridor, are not parallel to existing transmission lines, and are not crossing private lands that connect to the federally designated corridors.

3.2 PROPOSED PROJECT RIGHTS-OF-WAY

New permanent and temporary land-use rights for the transmission line right-of-way (ROW), work areas, and access roads will be required for the transmission line on federal lands and private lands. The TWE Project will require a ROW of 250 feet in width. However, increased ROW width may be required in a small number of site specific locations to accommodate rough terrain or unusually long spans. The substation/converter stations are anticipated to require approximately 200 acres each on private lands. The two ground electrode facilities are anticipated to require approximately 600 acres also on private lands.

3.2.1 Rights-of-Way Required on Federal Lands

TWE is requesting a ROW Grant from the BLM and a Special Use Permit (SUP) from the USDA, Forest Service, as required, for those portions of the transmission line facilities to be located on federal lands.

TWE will acquire long-term ROW grant(s) from the BLM to build, operate and maintain portions of the transmission line and access roads on public lands, administered by BLM in Wyoming, Colorado, Utah and Nevada. The TWE Project transmission line will require a ROW 250 feet in width. Increased ROW width may be required in a small number of site specific locations to accommodate rough terrain or unusually long spans. The fiber optics regenerative sites will be within the transmission line ROW. Access road right-of-ways on public lands are expected to vary in width up to 100 feet wide, depending on terrain. TWE will acquire long-term ROW grant(s) for the construction and maintenance of access roads, which are necessary for the construction, operation and maintenance of the TWE Project, on public lands.

TWE will additionally acquire temporary use permits for construction activities occurring on public lands both within and outside the long-term ROW grant. Temporary work areas will include staging areas, material storage areas, fly yards, pulling and splicing sites, work areas at each structure site, batch plant sites and guard structures. Temporary work areas are described further in POD Section 4.0.

ROW grants for the AC/DC converter stations and ground electrode facilities are not anticipated to be necessary on public lands, since these facilities are planned to be located on private lands in Wyoming and Nevada.

3.2.2 Private Lands Acquisition

Portions of the TWE Project, including sections of the 600 kV transmission line and substation/converter stations are planned to be located on land that is currently privately-owned. TWE will attempt to purchase those lands through reasonable negotiations with the landowners. To the extent that transmission line facilities are to be located on privately-owned land, TWE will attempt to obtain perpetual easements through reasonable negotiations with the landowners.

3.2.3 Line Crossings

Depending upon the final alignment of the TWE Project route, the TWE Project will require crossing other electrical transmission lines, U.S. and State Highways, and railroads. The location of existing transmission and other linear facilities relative to final transmission routing, topographical constraints, and any utility corridor boundary constraints that may exist would dictate the number and location of crossings. The proposed line crossings will be coordinated with each facility owner or manager, and TWE will obtain the required licenses, permits or agreements.

3.3 PROJECT FACILITIES

3.3.1 600 kV DC Transmission Line Characteristics

(The information presented in this section is preliminary and subject to change as design information becomes better known.)

Typical characteristics of a 600 kV DC transmission line are summarized in Table 3-1, and are described in this section of the POD. Final design for the TWE Project is pending completion of further transmission planning, engineering, and the NEPA compliance process, and will be documented in the COM Plan.

TABLE 3-1
TYPICAL DESIGN CHARACTERISTICS
600 kV DC TRANSMISSION LINE

Feature	Description
Physical Properties	
Line Length	Approximately 725 miles
Type of Structure	Proposed Structure Type: Guyed steel-lattice towers. Alternative Structure Designs: self-supporting, steel lattice towers, single shaft tubular steel poles
Structure Height	Guyed Lattice towers -120 to 180 feet; self supporting lattice towers – 120 to 180 feet; single shaft tubular steel poles - 100 to 150 feet
Span Length	Guyed lattice towers – 900 to 1,500 feet; self supporting lattice towers - 900 to 1,500 feet; single shaft tubular steel poles - 700 to 1,200 feet
Number of Structures per Mile	4 to 8 - depending on structure type, terrain and other factors to be identified through detailed design studies
ROW Width	250 feet. Increased right-of-width may be required in a small number of site specific locations to accommodate rough terrain or unusually long spans.
Land Temporarily Disturbed	
Structure Work Area	ROW width x 200 feet length per structure (assembly, erection, and crane pads typically require 200 x 200 feet per structure)
Wire-Pulling and Tensioning Sites	ROW width x 600 feet for dead-end structure conductor and shield wire sites (at all dead-end structures) ROW width x 500 feet for mid-span conductor and shield wire setup sites (approximately every 9,000 feet) 100 feet width x 500 feet for fiber optic cable set-up sites (approximately every 18,000 feet)
Wire-Splicing Sites	ROW width x 500 feet per conductor and shield wire setup site (approximately every 9,000 feet) ROW width x 500 feet each for fiber optic cable set-up site (approximately every 18,000 feet)
Construction Yards/ Staging Areas	20 to 25 total locations expected. Typical construction yards/staging areas approximately 20 acres.
Batch Plant Sites	20 to 25 batch plant sites, most located at construction yards/staging areas. Stand-alone temporary batch plants, estimated size: approximately 3 to 5 acres.
Guard Structures	100 x 100 feet at road and existing electrical line crossings
Land Permanently Required	
Structure Base	Guyed structure (tangent) – 22,500 square feet (150 x 150 feet guy/anchor footprint) Guyed structure (angle) – 15,000 square feet (100 x 150 feet guy/anchor footprint) Guyed structure (dead end) - 30,000 square feet (200 x 150 feet guy/anchor footprint) Lattice Tower (tangent) - 900 square feet (30 x 30 feet tower base) Lattice Tower (angle) - 1,225 square feet (35 x 35 feet tower base) Lattice Tower (dead-end) - 1,600 square feet (40 x 40 tower base feet) Single Pole Tubular Steel Structure (tangent) - 40 square feet (7 feet diameter foundation)

TABLE 3-1 TYPICAL DESIGN CHARACTERISTICS 600 kV DC TRANSMISSION LINE	
Feature	**Description**
	Single Pole Tubular Steel Structure (dead-end/angle) - 100 square feet (2 poles x 8 feet diameter foundations)
Regeneration Sites	12 to 15 Regeneration sites, most located on the transmission line ROW and each approximately 10,000 square feet (100 x 100 feet)
Access Roads	
Paved Roads	These roads are typically highways and state routes, and will be used for travel to existing and new dirt roads to access the ROW.
Dirt/Gravel Roads (no improvement)	Requires no improvement to dirt/gravel roads.
Dirt Road (with improvements)	Improvement of existing dirt roads (typically 14-20 feet wide) up to a maximum width of 24-feet.
New Access Road (bladed)	Roads, graded to a width of up to 20 feet, with a 2-foot berm on either side.
Overland Access	Drive and crush, typically 14-20 feet wide up to a maximum width of 24 feet
Electrical Properties	
Nominal Voltage	+/- 600,000 volts DC
Capacity	Up to 3,000 MW
Circuit Configuration	DC Bi-Pole Bundled
Conductor Size	Bundled 1949.6 kcmil 42/7 ACSR/TWD “Athabaska/TW”, with three subconductors per pole
Ground Clearance of Conductor	35 feet minimum at a conductor temperature of 212 degrees Fahrenheit (100 degrees Celsius)

3.3.2 600 kV DC Transmission Design

Structure Designs

The proposed structure design for the 600 kV transmission line is a guyed lattice steel structure, as shown on Figure 2. The guyed lattice steel structure is proposed for most structure locations as a result of constructability and cost considerations. Other typical 600 kV DC structure designs, which may be used in specific locations, are self-supporting steel lattice towers and singular pole tubular steel structures, illustrated in Figures 3 and 4. These alternative structure designs may be used where a determination is made based upon engineering or other site specific considerations, that a design other than the guyed lattice steel structure is more appropriate. All lattice steel structure types will be fabricated from unpainted galvanized steel. Tubular steel structures will be fabricated from self-weathering steel. Other design characteristics can be found in Table 3-1. Structure configuration and design may be refined as project development progresses. Transmission structure heights may vary from 100 feet to 180 feet depending upon structure type, terrain, span, and line crossings.

Foundations

The steel-lattice guyed towers generally require one, precast support pedestal for the tower base and four anchor rods for guy cables. The typical precast support pedestal will be 3 to 4 feet in diameter and 4 to 6 feet in depth. Due to site-specific characteristics, some foundations may require a cast-in-place support pedestal. The anchors for attachment of the guys will be plate anchors or rock anchors depending upon soil/rock conditions at each site.

Self-supporting, lattice steel structures each require four foundations with one foundation on each of the four corners (legs) of the lattice towers. The foundation diameter and depth will be determined during final design, and are dependent on the type of soil or rock present at each specific site. Typically, the foundations for the tangent lattice towers will be composed of steel-reinforced concrete drilled piers, with a typical diameter of 3 to 4 feet and a depth of approximately 12 to 25 feet.

Self-supporting, single shaft steel poles require one cast-in-place foundation. The self-supporting tubular-steel structures will be installed on a single pier with anchor-bolt foundations, or directly imbedded into the foundation. Foundations for these structures will typically be 6 to 10 feet in diameter and 20 to 60 feet in depth.

Conductors

A DC transmission line consists of two poles (or circuits), with a three conductor bundle for each pole. Spacing between subconductors in a bundle is typically 18 inches. Aluminum-stranded conductors with a steel-stranded reinforced core will be used. The aluminum carries the majority of the electrical current, and the steel provides tensile strength to support the aluminum strands. Minimum conductor height above the ground for the 600 kV DC line will be 35 feet at a conductor temperature of 212 degrees Fahrenheit (100 degrees Celsius), in accordance with the National Electric Safety Code (NESC). The exact height of each tower will be governed by topography and safety requirements for conductor clearance.

Insulators and Associated Hardware

Insulator assemblies for tangent structures will consist of two strings (or units) of insulators normally in the form of a “V”. Upon final design, and in select locations, insulation for the conductors may consist of one insulator string hung vertically from the support arm in the form of an “I”. These insulator strings (in either a “V” or “I” configuration) are used to suspend each conductor bundle (pole) from the structure,

maintaining the appropriate electrical clearance between the conductors, the ground, and the structure. Dead-end insulator assemblies will use an I-shaped configuration, which consists of insulators hung from either a tower dead-end arm or a dead-end pole in the form of an "I". Tangent, suspension or dead-end insulator "strings" will be composed of multi-unit grey porcelain or green-tinted toughened glass insulators or single unit non-ceramic polymer insulators.

Overhead Ground (Shield) Wires

To protect the 600 kV transmission line from direct lightning strikes, each structure will have two lightning protection ground wires, also referred to as shield wires, installed on the peaks or top arms of each of the structures. Current from lightning strikes would be transferred through the ground wires and structures into the ground.

One of the shield wires will be composed of extra high strength steel wire approximately 0.5 inch in diameter. In short sections of the transmission line, near the terminals, this shield wire may also serve as the overhead electrode line connecting the AC/DC converter station to the ground electrode facility. The second shield wire will be an optical ground wire (OPGW) constructed of aluminum and steel, which carries 36 to 48 glass fibers within its core. The OPGW will have a diameter of approximately 0.65 inch. The glass fibers inside the OPGW shield wire will facilitate data transfer between the two AC/DC converter stations. The data to be transferred is required for system control and monitoring.

Grounding Rods

A grounding system will be installed at the base of each transmission structure that will consist of copper ground rods embedded into the ground in immediate proximity to the structure foundation and connected to the structure by a buried copper lead. After the ground rods have been installed, the grounding will be tested to determine the resistance to ground. If the resistance to ground for a transmission structure is excessive, then counterpoise will be installed to lower the resistance. Counterpoise consists of a bare copper-clad or galvanized-steel cable buried a minimum of 12 inches deep, extending from structures (from one or more legs of a structure) for approximately 200 feet within the ROW.

Figure 2 – Proposed Structure Design –
Typical 600 kV DC Guyed V-String Lattice Structure

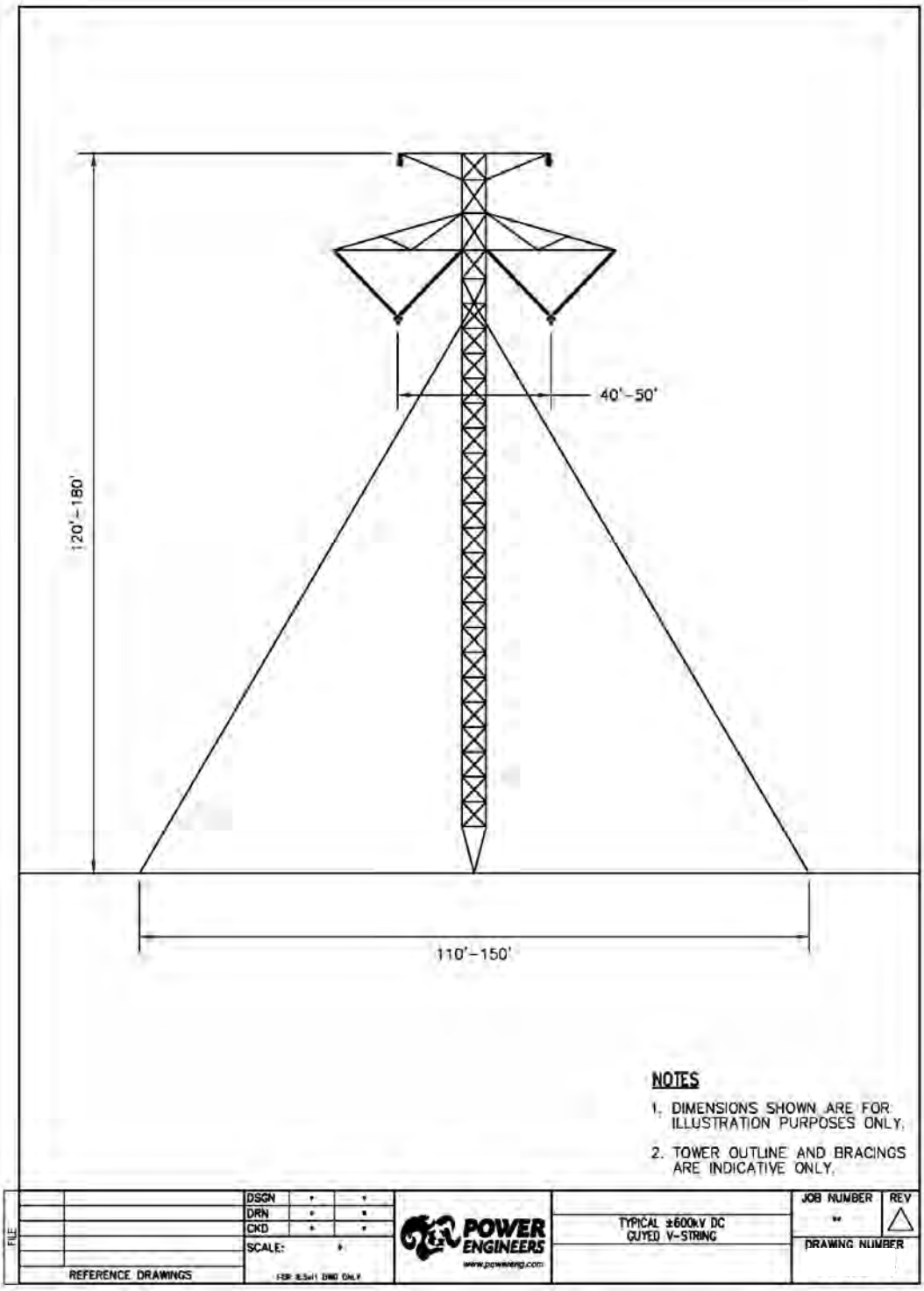


Figure 3 – Alternative Structure Design - Typical 600 kV DC Self Supporting Lattice V-String Structure

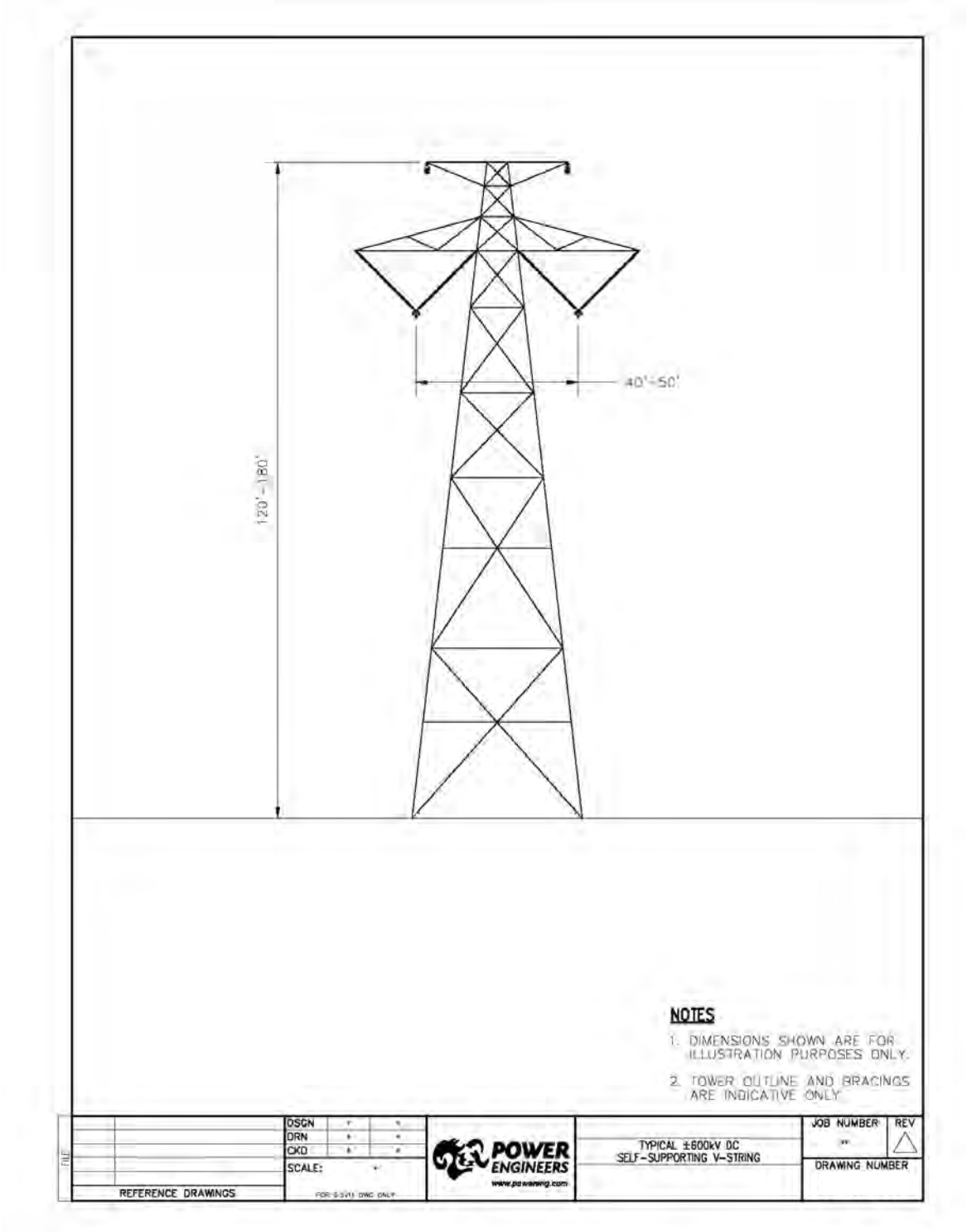
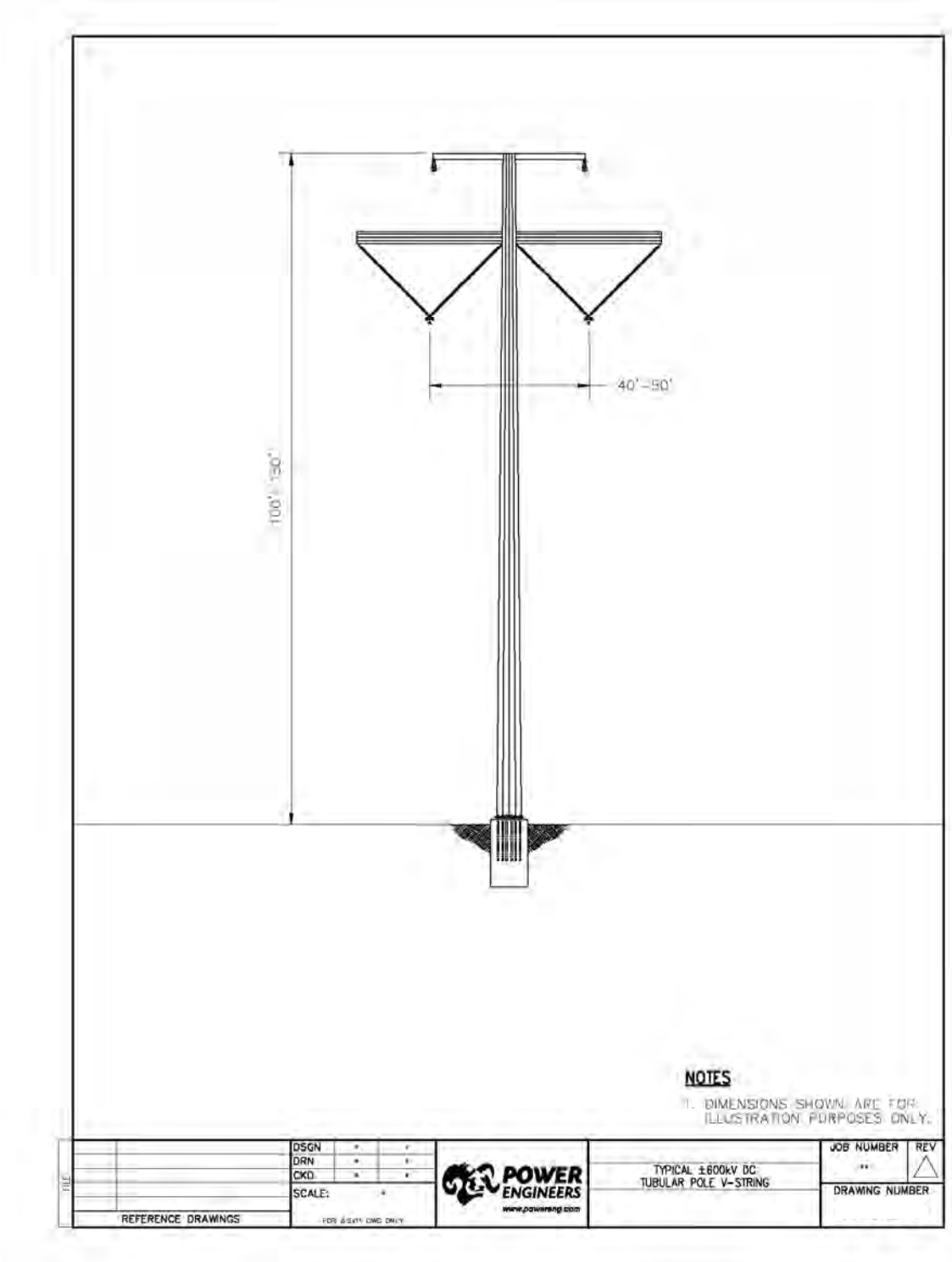


Figure 4 – Alternative Structure Design - Typical 600 kV DC Tubular Steel Pole V-String Structure



3.3.3 AC/DC Converter Stations

The AC/DC converter stations at each terminus will be designed to include the DC and AC switchyards, AC/DC conversion equipment, and transformers. A typical AC/DC converter station may require an area encompassing approximately 50 to 100 acres with adequate buffer areas for transmission line entrance corridors to expand the property acquisition to 200 acres. The largest electrical facility within the overall footprint for the AC/DC converter station will be the AC switchyard. There will be one or two buildings to house the AC/DC conversion equipment, each approximately 200 feet long by 75 feet wide by 80 to 100 feet high. Additionally, there will be smaller buildings to house the control room, control and protection equipment, auxiliaries, and cooling equipment.

Table 3-2 summarizes the general characteristics of the AC/DC converter stations.

TABLE 3-2
TYPICAL DESIGN CHARACTERISTICS
AC/DC Converter Stations and Ground Electrode Facilities

Feature	Description
AC/DC Converter Station	Approximately 200 acres will be secured through lease/purchase. Physical substation, AC/DC converter facilities, maintenance and operations facilities are proposed to occupy approximately 50 to 100 acres.
Planned Northern AC/DC Converter Station	Six 500 kV AC line positions, four 230/500 kV transformers, eight 230 kV line positions, two 500 kV AC filter line positions, two DC line positions with transformers, converter building(s) and AC and DC filter yards. Additional compensation equipment may require other structures and building development within the proposed complex. Maintenance and storage facilities will be developed as required and appropriate for this remote location. Certain assigned shift operators, maintenance staff, and site security staff will be on site at all times, although no permanent residence(s) will be established. On site fire protection and emergency/security staff will support operations and maintenance staff at the facility, in accordance with state, county, and federal requirements.
Planned Southern AC/DC Converter Station	Six 500 kV AC line positions, two 500 kV AC filter line positions, two DC line positions with transformers, converter building(s) and AC and DC filter yards. Maintenance and storage facilities will be developed as required and appropriate for this remote location. Certain assigned shift operators, maintenance staff, and site security staff will be on site at all times, although no permanent residence(s) will be established. On site fire protection and emergency/security staff will support operations and maintenance staff at the facility, in accordance with state, county, and federal requirements.
Ground Electrode Facility	Approximately 600 acres for each facility.

3.3.4 Fiber Optic Communications and Regeneration Sites

The TWE Project will include a communications system consisting of a fiber optic network necessary for command and control of the transmission system (referred to as Supervisory Control and Data Acquisition or "SCADA"). The fiber optic network will require regeneration sites at periodic distances along the transmission line, as determined in the detailed engineering studies. In general, these regeneration sites will be within the transmission line ROW. The Applicant may also contract with third parties for the sale and use of excess fiber optic capacity. No additional facilities are anticipated for third party use of excess fiber optic capacity.

Primary communications for relaying and control will be provided via the one OPGW that will be installed in the shield wire position on the transmission line. For redundancy purposes, a secondary communications path will be provided via existing or expanded/upgraded microwave systems in the TWE Project region. A small number of new microwave sites may be required for the TWE Project. The

number, location, and typical design and layout of microwaves sites will be determined as project engineering progresses.

As the optical data signal is passed through the optical fiber cable, the signal degrades with distance. Consequently, signal regeneration sites are required to amplify the signals if the distance between stations or regeneration sites exceeds approximately 50 miles. A total of 12 to 15 regeneration sites will be required.

In most cases, land for a regeneration site must be obtained along the final transmission line route. These regeneration sites are typically 100 feet by 100 feet, with a fenced area of 75 feet by 75 feet. A 12-foot by 32-foot by 9-foot-tall building or equipment shelter (metal or concrete) will be placed on the site, and access roads to the site and power from the local electric distribution circuits will be required. An emergency generator with an LP gas fuel tank will be installed at the site inside the fenced area. Two diverse cable routes (aerial and/or buried) from the transmission ROW to the equipment shelter will be required.

The regeneration sites will also provide mobile radio UHF/VHF communications support for transmission line patrol and maintenance operations and allow emergency operations independent of commercial common carrier (i.e. cellular telephone).

3.3.5 Ground Electrode Facilities

Two ground electrode facilities will be built, one at each terminal location to establish and maintain electrical current continuity immediately following the unexpected outage of one of the two poles (or circuits) of the 600 kV DC transmission line or terminal equipment. The ground electrodes are used to establish an emergency earth return for the electrical current that was previously flowing in the non-operational pole. Such contingency conditions are most often the result of an unexpected outage on the transmission line or equipment in the AC/DC Converter Station. The operation of the ground electrode facilities and the use of the earth as a return path is limited to unexpected emergency conditions and typically only operated for 10 minutes to less than an hour following the loss of a pole. The use of these facilities allows system operators to utilize a portion of the TWE Transmission Project's capacity to maintain a reliable transmission system, while they determine the extent of the damage and reconfigure the transmission system into a new more permanent configuration. The ground electrode facility for the northern terminal will be located 10 to 50 miles from the terminal. The ground electrode facility for the southern terminal will be located 50 to 100 miles north and east of the terminal

Each ground electrode facility will consist of a network of 40 to 80 (drilled) deep earth wells (electrodes), grouted to a depth of 100 feet to over a 1,000 feet deep, depending upon the geological structure and the resistivity of soil layers across the site, which may be up to 600 acres in size. Each well will be electrically interconnected to a small control building via buried low voltage underground cables. Each well and the electrode line will be constantly monitored via a telecommunications link that will utilize fiber-optic or fixed radio communications equipment. Ground current will be effectively shared via the buried electrode network interconnecting the wells to create a very low resistance earth connection by distributing the ground current over a large area. Surface access to the wells will be via utility access vault type arrangements to prevent any public access to the well connections or the electrode components. Figure 5 shows a typical layout of a ground electrode system. Figure 6 is a photograph of an existing system following construction.

Figure 5 – Typical Site Plan – Ground Electrode System

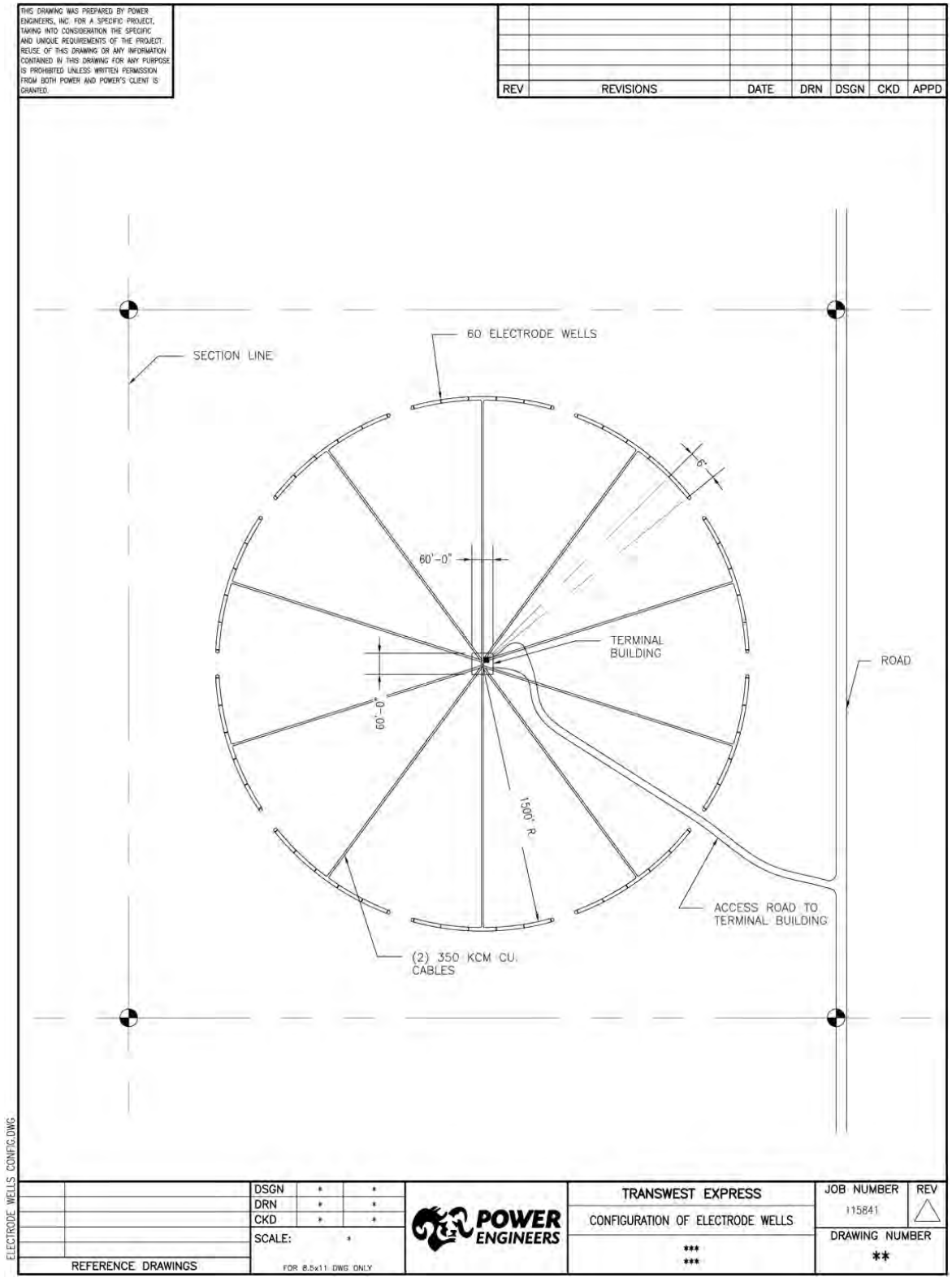


Figure 6 – Photograph of Typical Ground Electrode System

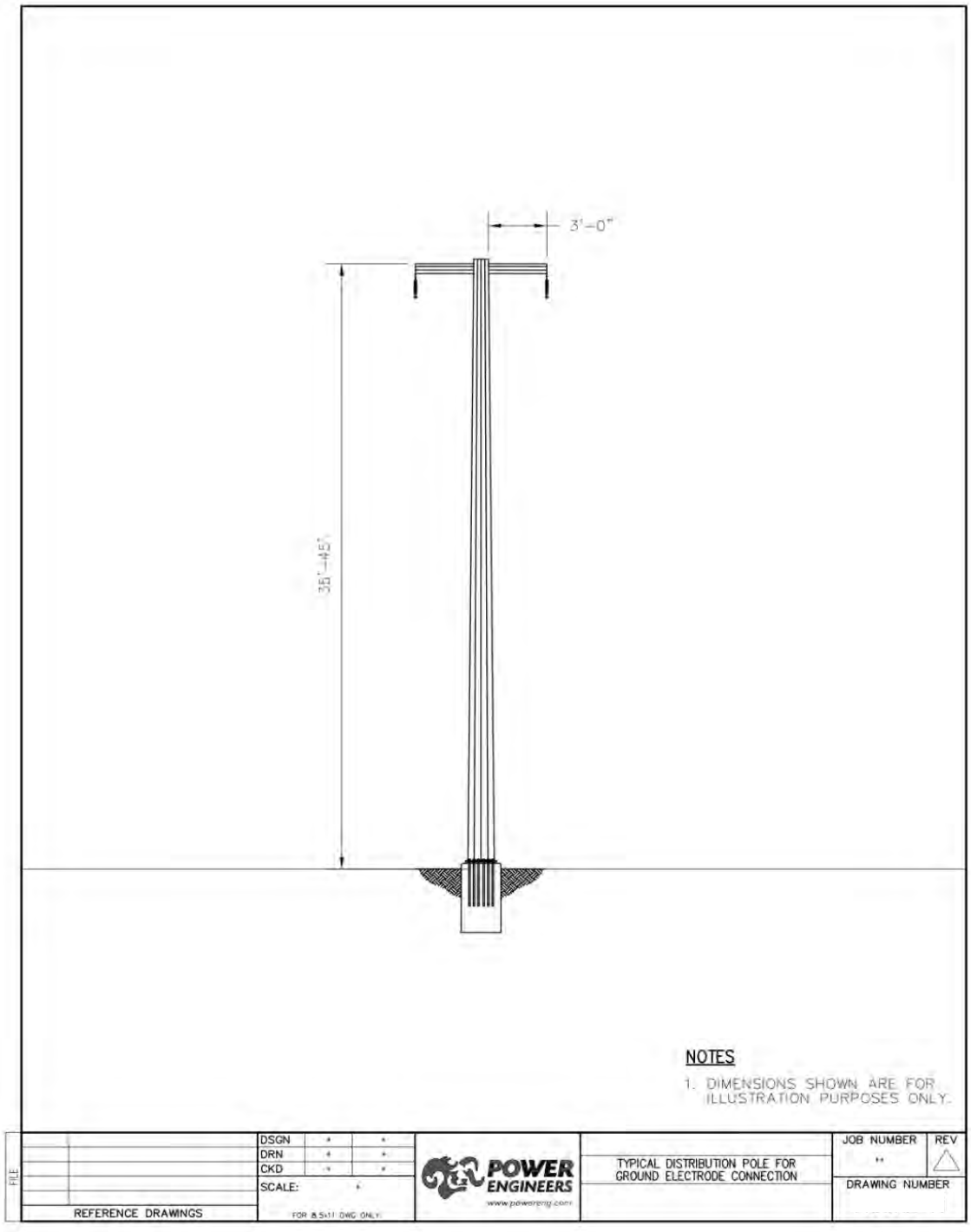
The overhead electrode line connecting the AC/DC converter station to the ground electrode facility will be similar to a modified 34.5 kV/69 kV distribution/subtransmission line. To the extent practical, the overhead electrode line will be co-located on the new DC transmission structures in the overhead shield wire position. In these instances, the distribution transmission line will not be visibly different on the 600 kV DC line than where it is not present. Where the 34.5 kV/69 kV line is located on a separate structure and ROW, the structure would be similar to the design shown on Figure 7.

3.3.6 Access Roads

Surface access will be required to each transmission structure, as well as to the ground electrode sites and AC/DC converter stations. The TWE Project will use existing access roads wherever available and practical, thus keeping new construction to a minimum.

Access roads will include the use of existing roads, improved existing roads, new overland construction, and new bladed construction. In some cases, access roads will be required between the proposed transmission line ROW and existing roads across public or private lands. An unknown portion of the existing road network will require upgrading. This could include improvements such as clearing overgrown vegetation, re-grading, and/or installing drainage structures. During construction, gates will be installed to restrict access to the ROW to authorized parties and to limit access across public and private lands. The installation of gates and construction of access roads will be undertaken as agreed upon with the landowner or agency that controls the land.

Figure 7 – Typical Distribution Transmission Line Design for Connecting the AC/DC Converter Station and Ground Electrode Facility



The widths of access roads are typically 14 to 20 feet but could be up to 24 feet depending upon terrain, site constraints, equipment requirements and travel patterns. Where required, new, up to 20-foot-wide bladed roads, with a 2 foot berm on each side, for a total width of 24 feet, would be built, but the roads typically would not include an improved ditch drainage system. However, if improved existing access has been identified for use, the assumption is that most of these roads would be approximately 10 to 14 feet wide and would require 0 feet up to 14 feet of additional improvement, for a total width of 24 feet for equipment access. As previously stated, wherever practicable, permanent access roads will be located within the transmission line ROW; however, off transmission line ROW access across federal, state or private lands from public or private roads and highways is anticipated.

Where structure sites are not immediately accessible from existing roads and terrain is suitable, short routes of non-graded overland access ("drive & crush") will be located to access the site. The construction of new (bladed) spur roads will be required only as necessary, to access structure sites that lack direct access from existing roads or where topographic conditions (e.g., steep terrain, rock outcrops, and drainages) prohibit safe overland access to the site. New spur roads will be located within the ROW whenever practical and will be located to minimize potential environmental impacts. The number of new spur roads will be held to a minimum, consistent with their intended use (e.g., structure construction or conductor stringing and tensioning).

Specific actions will be implemented to reduce construction impacts. Standard design techniques such as installing water bars and dips to control erosion will be included. In addition, measures will be taken to minimize impacts in specific locations and during certain periods of the year. For example, construction activities will not occur when weather or other conditions increase potential environmental impacts to unacceptable levels, as determined by the agencies. Such conditions can arise during heavy rains or high winds. To prevent impacts during such periods, construction activities will be restricted or curtailed.

The number of new roads will be consistent with their intended use and will be part of the permanent ROW for maintenance. Because the exact location of roads cannot be determined until final design of the transmission line, the specific information on total miles and location of new and improved roads will be provided as part of the COM Plan.

3.3.7 Temporary Work Areas

The TWE Project will require several types of temporary use areas during construction. Temporary work areas will include staging areas, material storage areas, fly yards, pulling and splicing sites, work areas at each structure site, batch plant sites and guard structures. Tables 3-1 and 3-2 summarize the types of temporary use areas that will be needed for the TWE Project facilities. The locations of temporary work areas will be determined during final design and included in the COM Plan. POD Section 4.0 further describes the temporary work areas that will be required.

SECTION 4.0 – TWE PROJECT CONSTRUCTION

POD Section 4.0 describes the process anticipated during the construction of the TWE Project. Topics discussed are: pre-construction activities, the construction workforce and schedule, and construction activities for the 600 kV DC transmission line, AC/DC converter stations and ground electrode sites.

4.1 PRE-CONSTRUCTION ACTIVITIES

Pre-construction activities will include obtaining all necessary permits, notifying and coordinating with resource agencies, and conducting agency-required pre-construction surveys for sensitive environmental resources. During this phase, ground-based land surveys will also be conducted for structure location staking, access road layout and geologic/geotechnical investigations.

4.1.1 Permits

Prior to the initiation of construction, applicable federal, state, and local permits necessary for the TWE Project construction will be obtained. See POD Section 7 for a preliminary list of potentially applicable permits.

4.1.2 Contractor and Key Agency Coordination

Prior to the initiation of construction, a pre-construction kickoff meeting will be conducted to introduce the contractors and their field representatives, discuss schedules, and identify each agency's point of contact and responsibilities. All supervisory construction personnel will be instructed on the protection of biological, cultural, paleontological, and other resources, including their specific mitigation measures. The process for conducting worker environmental training will also be reviewed.

Following completion of construction, the transmission line, converter station/substation and ground electrode facilities will be mapped "As-Built" and the plans will be submitted to the appropriate land management agencies for review and comment. A project close-out meeting will be held following the completion of construction and prior to operation of the transmission line.

4.1.3 Preconstruction Surveys

Pre-construction surveys will be completed to identify sensitive resources and to implement agency required mitigation measures. Investigations may include, but are not limited to: (1) Desert Tortoise and greater Sage Grouse surveys, (2) rare and sensitive plant surveys, (3) noxious weed surveys, (4) cultural resource surveys, and (5) wetlands delineations in accordance with requirements for the Clean Water Act, Section 404 permit. Preliminary Applicant committed mitigation measures to address potential issues associated with the construction of the TWE Project relative to these resources are in Section 6.0 of this amended Preliminary POD. The Final POD will document all surveys and mitigation measures required by BLM and other federal permitting agencies.

Prior to construction of the TWE Project, additional ground-based land surveys will be required, including structure location (structure staking) surveying, access road layout and staking of soil boring locations required for the geotechnical investigations.

4.2 CONSTRUCTION WORKFORCE AND SCHEDULE

It is anticipated that total construction time for the transmission line will be up to 3 years, concurrent with substation/converter stations and ground electrode construction. The estimated number of potential workers and types of equipment required to construct the proposed transmission line, substation/converter stations and ground electrode facilities are shown in Tables 4-1 and 4-2. Construction will occur in phases at different locations throughout the construction process and in some cases at the same time at different locations. Regular field meetings will be held with the environmental monitors to coordinate construction activities with monitoring requirements.

TABLE 4-1
600 KV TRANSMISSION LINE CONSTRUCTION
ESTIMATED PERSONNEL AND EQUIPMENT

Activity	People	Quantity and Type of Equipment	
Survey Crew	6	2	pickup trucks
		2	ATV
Geologic/Geotechnical Investigations	6	2	pickup trucks, 4 wheel drive
		1	ATV
		2	rubber tire drill trucks (2 ton)
Road Construction Crew	6	2	dozer (D-8 Cat or equivalent)
		1	motor grader
		1	pickup truck
		2	carry alls
		1	water truck (for construction and maintenance)
		1	dump truck
		1	front end loader
		1	diesel tractor w/lowboy
Foundation Installation Crew	28	4	hole diggers
		2	dozers
		2	trucks (2 ton)
		2	trucks, flatbed, w/boom (5 ton)
		4	concrete trucks
		2	dump trucks
		2	diesel tractors (equipment hauling)
		3	pickup trucks
		1	mechanics truck
		1	water truck
		1	carry all
		2	cranes, all terrain (35 ton)
		1	front end loader
		1	backhoe, w/bucket
		1	wagon drill
		3	equipment-tool trailers
Anchor Installation	20	2	pickup trucks
		4	carry alls
		1	truck, flatbed (2 ton)
		2	trucks, flatbed, w/boom (5 ton)
		1	dump truck
		1	water truck
		2	concrete trucks
		1	mechanics truck
		2	diesel tractors, w/lowboy
		2	dozers
		1	loader, front end
		3	backhoes, w/bucket
		3	wagon drills
		3	cranes, all terrain (35 ton)

TABLE 4-1 600 KV TRANSMISSION LINE CONSTRUCTION ESTIMATED PERSONNEL AND EQUIPMENT			
Activity	**People**	**Quantity and Type of Equipment**	
		1	equipment-tool trailer
Structure Steel Haul Crew	8	2	diesel tractors (steel hauling)
		1	pickup truck
		1	truck, flatbed (2 ton)
		1	carry all
		5	cranes, all terrain (35 ton)
		3	fork lifts
Structure Assembly Crews 5-7 Crews	64	2	pickup trucks
		10	carry alls
		5	cranes, all terrain (35 ton)
		1	water truck
		5	air compressors
		2	trucks (2 ton)
		1	mechanics truck
		2	tool-equipment trailers
Structure Erection Crews 1-2 Crews	22	2	cranes (120 - 300 ton)
		2	trucks (2 ton)
		2	pickup trucks
		5	carry alls
		1	mechanics truck
		2	air compressors
		1	tool-equipment trailer
Wire Installation Crew	36	6	wire reel trailers
		4	haul trailers
		4	diesel tractors
		4	cranes (2) 20 ton, (2) 30 ton
		5	trucks, flatbed, w/bucket (5 ton)
		4	pickup trucks
		2	splicing trucks
		2	3-drum pullers (1 medium, 1 heavy)
		2	single drum pullers (large)
		1	backhoe, w/bucket
		1	water truck
		2	trucks, flatbed (2 ton)
		4	double bull-wheel tensioner (2 light and 2 heavy)
		2	sagging equipment (D-8 Cat)
		6	carry alls
		2	static wire reel trailers
		3	tool-equipment trailers
		2	mechanics trucks
Clean-Up Crew	4	1	truck, flatbed, w/bucket (5 ton)
		1	pickup truck
		1	carry all
Road Rehabilitation Crew (ROW Restoration)	6	1	dozer (D-8 Cat or equivalent)
		1	front end loader w/bucket
		1	backhoe, w/bucket
		1	diesel tractor, w/lowboy
		1	seeding/harrowing equipment, w/tractor
		1	motor grader
		1	pickup truck
		1	dump truck
		1	carry all
Estimated maximum personnel required for all transmission line tasks including maintenance, management, and quality control personnel = 250			

TABLE 4-2 600 kV SUBSTATION/CONVERTER STATION AND GROUND ELECTRODE CONSTRUCTION ESTIMATED PERSONNEL AND EQUIPMENT			
Activity	**People**	**Quantity of Equipment**	
Survey Crew	4	2	pickup trucks
Site Management Crew	10-12	4	office trailers
		4	pickups
		4	generators
Site Development-Civil Work Crew	30-35	4	scrapers
		2	dozers (ripper)
		2	motor graders
		2	roller compactors
		2	excavators
		4	dump trucks
		3	water trucks
		1	mechanics truck
		1	fuel truck
		2	pickup trucks
		6	carry alls
Fence Installation Crew	10 – 20	1	pickup truck
		1	boom truck
		2	carry alls
		1	backhoe
		1	concrete truck
		1	reel stand truck
		2	Bobcats
Equipment Footings Installation Crew	24-30	2	hole diggers
		2	boom trucks
		1	excavator
		3	concrete trucks
		1	dump truck
		1	roller compactor
		2	plate compactors
		1	backhoe
		2	Bobcats
		1	mechanics truck
		1	fuel truck
		1	water truck
		2	pickup trucks
		4	carry alls
Cable Trench, Conduits, and Station Grounding Crew	12-16	2	trenchers
		2	dozers (ripper)
		2	roller compactors
		2	plate compactors
		2	excavators
		1	boom truck
		3	pickup trucks
		2	flatbed trucks
		4	carry alls
		1	air compressor
		1	backhoe
		1	mechanics truck
		1	fuel truck
		1	dump truck
		1	reel stand truck
Steel Structure and Bus Installation Crew,	16-24	2	cranes, RT
		2	high capacity cranes

TABLE 4-2 600 kV SUBSTATION/CONVERTER STATION AND GROUND ELECTRODE CONSTRUCTION ESTIMATED PERSONNEL AND EQUIPMENT			
Activity	**People**	**Quantity of Equipment**	
Converter Valve Hall, Ancillary Buildings Construction Crew, Equipment Assembly and Erection Crew		4	boom trucks
		6	manlifts
		4	welder trucks
		2	carry alls
		3	pickup trucks
		2	flatbed trucks
		1	mechanics truck
		4	vans
		2	flatbed trucks
Control Building and Wiring Crew	20-24	2	boom trucks
		4	manlifts
		3	wire pullers-small
		2	reel stand trucks/trailers
		4	vans
		4	pickup trucks
		2	carry alls
		1	splicing van
		2	concrete trucks
		1	Bobcat
		1	trencher
		2	plate compactors
Ground Electrode Construction Crew	12-18	2	pickup trucks
		1	fuel truck
		1	water truck
		2	trenchers
		2	drill rigs
		1	boom truck
		2	flatbed trucks
		1	Bobcat
		1	backhoe
		1	mechanics truck
		1	concrete trucks
		1	air compressor
The above table reflects estimated personnel requirements, which may reach as high as 150 for substation/converter station and ground electrode construction, including maintenance, management, and quality control personnel.			

4.3 GENERAL CONSTRUCTION ACTIVITIES

The activities associated with the construction of the TWE Project transmission line, converter stations and ancillary facilities are described below.

4.3.1 Transmission Line Construction

The construction of the 600 kV DC transmission line will entail completing the following tasks and activities, which will generally occur in sequential order, as listed below:

- Surveying the transmission centerline, other project features, and work areas
- Geologic evaluation and geotechnical investigation
- Upgrading and constructing temporary and permanent access roads
- Clearing and grading along portions of the ROW and at construction sites
- Construction activities at temporary work areas
- Excavating and installing foundations
- Assembling and erecting structures with temporary and permanent pad sites
- Stringing conductors and shield wires
- Installing structure grounds and counterpoise where needed
- Clean-up and restoration of affected areas

Surveying the Transmission Centerline, Other Project Features, and Work Areas

Ground survey and staking will be performed to locate structure centers, structure references, ROW boundaries, new access roads, spur roads to structure sites, overland access, and temporary work areas. Temporary work areas will include staging areas, material storage areas, fly yards, pulling and splicing sites, work areas at each structure site, batch plant sites and guard structures. Sensitive environmental features to be avoided will also be flagged. Environmental monitoring activities will be in place during this phase. Specific flagging and staking procedures will be described in detail in the Flagging, Fencing, and Signage Plan. Flagging will be maintained until final clean-up and/or restoration is completed, after which they will be removed.

Geologic Evaluation and Geotechnical Investigation

The geologic evaluation and geotechnical investigations will be performed as part of the general construction activities in conjunction with final engineering in order to evaluate potential geologic and geotechnical hazards, and determine specific requirements (ground conditions, soil types, depth to rock, depth to water, soil strength properties, etc.) for foundation design and construction.

The geological evaluation would occur at generally the same time as the geotechnical investigation and be made part of the final geotechnical report. For this activity, the engineering geologist will evaluate fault lines, landslide prone areas, steep slopes and unstable soils to identify potential hazards, primarily at structure sites. Geologic review and evaluation will also be performed in the immediate vicinity of structure sites and for access roads crossing steep slopes and unstable soils. The primary purpose of the geologic evaluation is to identify potential hazards with sufficient time to allow for evaluation of options and design changes for avoiding or mitigating the potential hazards. The geotechnical engineer and geologist will prepare a report that includes recommendations for moving the structures or roads, or identify construction methods to stabilize the site or off-site areas that will threaten the hazard sites if the structures cannot be moved. These recommendations will be incorporated into the COM Plan including construction details for grading, drainage, and specialized slope treatments, and the Construction

Contractor will implement the plans. All geologic/geotechnical field studies required will be coordinated with the appropriate land management agencies and the appropriate permits will be obtained.

Geotechnical investigations will be performed in the field to evaluate the soil strength and bearing capacity of site soils, which is necessary for determining proper structure foundations. This effort would entail field investigations at structure site locations along the agency-approved alternative. The drilling program will consist of drilling borings from which soil and/or bedrock material samples would be taken for laboratory testing and analysis. The field portion of the geotechnical investigation will include soil borings approximately 6 to 8 inches in diameter up to 70 feet deep at structure site locations at intervals of approximately 1 mile.

Soil borings will be performed with rubber tired or low impact drill rigs using approved access routes and methods in accordance with agency requirements and the applicable mitigation measures. Equipment typically used for geotechnical evaluations is listed on Table 4-1 and includes a drill rig, water truck, and 4-wheel drive support vehicles. The average estimated drilling time at each site is approximately one-half day. Work areas are typically 40 feet by 40 feet in size (1,600 square feet/0.37 acre).

Some surface disturbances may occur at the structure site drill locations from the parking and use of equipment and field crew activities in the work area. Some water may be used during the drilling process and a small amount of water may exit the drill holes. Following the completion of drilling at each site, soil boring would be backfilled with the drilled materials. Any remaining soils would be spread at the site. The size of excess soil spreading is small, and typically does not exceed 10 feet by 10 feet in size. No open holes would be left unattended and all holes will be backfilled prior to leaving the site.

Upgrading or Construction of Temporary and Permanent Access Roads

The appropriate agencies and private landowners will be consulted before road construction begins. Roads will be upgraded or constructed in accordance with agency requirements and the applicable mitigation measures. The general locations of proposed new and existing access roads will be shown in the Final POD.

Where possible, existing paved and unpaved highways and roads will be used for the initial transportation of materials and equipment from the staging and storage areas, to locations where they will be needed along the transmission line ROW. If necessary, existing roads will be upgraded, and all roads utilized will be left in a condition equal to or better than their condition prior to construction. Where possible, existing access roads will be used and, as required, new spur roads to structure sites will be constructed and located to minimize impacts. The number of new spur roads will be held to a minimum, consistent with their intended use (e.g., structure construction or conductor stringing and tensioning). Where required, new 20-foot-wide bladed roads with 2 feet of berm on each side will be built, but they typically will not include an improved ditch drainage system. If improved existing access has been identified for use, it is assumed that most of these roads are approximately 10 feet wide (e.g., two-track roads) and will require up to 14 feet of additional improvement for equipment access (i.e., widening of existing roads). For areas that do not require new access roads on the ROW, overland access will be used.

Due to rough terrain conditions, new roads that must be graded for access along steep slopes (side-hill roads) will most likely exceed a 24-foot width, with the total disturbed width varying from 24 to 100 feet depending on the amount of displaced soil. In addition, meandering roads may be required in specific areas due to geologic conditions or to avoid sensitive resources. As-built drawings showing these and other necessary deviations will be submitted to appropriate land management agencies upon completion of construction of the TWE Project. To the maximum extent practical, drainages will be crossed at grade (referred to as an Arizona Crossing). Where Arizona Crossings are not feasible, culverts will be

constructed and may be temporary in nature. Any permanent disturbances over a 1/10 acre will require consultation and approval by the appropriate land management agencies and U.S. Army Corp of Engineers and special permits will be required. Where required, some existing roads will be improved. These roads (with the exception of side-hill roads) will not exceed 24 feet maximum and will be flagged to identify the width of road to be used.

During construction, dust control measures will be implemented on all roads as determined by the authorized officer. Methods to minimize dust and erosion control associated with existing and new access will be included in an Erosion, Dust Control, and Air Quality Plan.

Following construction, where reasonable, in the areas where it has been determined the access roads will be temporary, the topsoil may be bladed back across the disturbed road section and the access blocked as determined through mutual agreement by the Applicant and the appropriate land management agencies. In these areas, seeds and roots contained within the respread topsoil layer normally provide a natural source for new growth. A ROW Preparation, Rehabilitation, and Restoration Plan will be developed with the COM Plan.

It is assumed that all existing and new permanent access may be used for operations and maintenance purposes. In certain areas, roads may be blocked or gates will be installed following completion of construction to restrict future general or public access, as required by appropriate land management agencies or private land owners.

Clearing and Grading Along Portions of the ROW and at Construction Sites (Tower Sites, Regeneration Sites, Staging Areas, Fly Yards, Pulling and Tensioning Areas, and Batch Plants)

Clearing of natural vegetation will be required for construction purposes at staging areas, structure sites, fly yards, pulling and tensioning areas, regeneration sites, and concrete batch plants areas. Clearances are also required along the ROW for electrical safety, long-term maintenance, and reliability of the transmission line. Within the ROW, mature vegetation will be selectively removed under or near the conductors to provide adequate electrical clearance as required by NESC. Trees that could fall onto the transmission line, affect the transmission line during wind-induced conductor swing, or otherwise present an immediate hazard to the transmission line, or have the potential to encroach within safe distance to the conductor as a result of bending, growing, swinging, or falling toward the conductor, will be removed. These trees, referred to as “danger trees,” may also occur adjacent to the ROW. If this is the case, any clearing of “danger trees” outside of the approved ROW will require the approval of the appropriate land management agencies in accordance with the clearing practices. Where required in selective areas, planned removals and selective clearing plans will be submitted to the appropriate land management agencies for approval.

Construction Activities at Temporary Work Areas (Construction Staging Areas, Storage Yards, Concrete Batch Plants, Stringing Sites, Structure Assembly Sites)

Construction Staging Areas

Previously disturbed federal, state lands, and/or private property will be used to the maximum extent practicable for construction staging and personnel reporting. It is estimated there will be 20 to 25 staging areas with material storage yards for this proposed Project, ranging in size from 15 to 25 acres each. These yards will be used throughout the duration of the TWE Project construction for receiving, storage, and transfer of required materials.

Concrete Batch Plants

Concrete for use in the structure foundations will be dispensed from portable concrete batch plants located at approximately 25-mile intervals along the ROW. It is estimated there will be 20 to 25 portable batch plant locations required for this proposed Project, ranging in size from 3 to 5 acres each, most located at staging areas. Equipment typically required at a batch plant site includes generators, concrete trucks, front-end loaders, Bobcat loaders, dump trucks, transport trucks and trailers, water tanks, concrete storage tanks, scales, and job site trailers. Rubber tired trucks and flatbed trailers will be used to assist in relocating the portable plant along the ROW. Commercial ready-mix concrete may be used when access to tower construction sites is economically feasible. Batch plant sites, although temporary in nature, will also be fenced.

The staging areas, construction yards, and batch plants will also serve as field offices, reporting locations for workers, parking areas for vehicles and equipment, and locations for equipment maintenance. The COM Plan will identify the location and use of temporary work areas.

Equipment Staging

Staging of equipment will be located at staging areas, pulling and tensioning sites or other temporary work areas previously described. These areas will be used to temporarily lay out equipment to be used for work on specific project activities at nearby locations.

Equipment Refueling

The contractor will implement standard refueling procedures for heavy equipment that is left on the ROW for long periods of time such as cranes, blades, dozers, drill rigs, etc. This equipment will be refueled in place. As a rule, no personal or light duty vehicles will be allowed to refuel on the ROW. Procedures and precautions similar to those used for helicopter refueling (discussed below) will be utilized.

Temporary Water Use

Water use is primarily for foundation construction of substation/converter station and transmission line structures and dust control during ROW and substation/converter station grading and site work. The required water will be procured from municipal industrial sources. No new water right will be required.

Excavating and Installing Foundations

The self-supported tubular steel structures and self-supported lattice towers will typically be supported by cast-in-place drilled concrete pier foundations. For these structure types, vertical excavations for foundations will be made with power drilling equipment. Where soils permit, truck- or track-mounted augers of various sizes, depending on the diameter and depth requirements of the hole to be drilled, will be used. Foundations for guyed lattice structures will typically be small precast or cast-in-place concrete pedestals. The precast pedestals are hauled to the structure site on a flatbed truck and set in a small excavation dug by a backhoe or digger.

In rocky areas, the foundation holes may be excavated by drilling or blasting methods, or installing special rock anchor or micro-pile type foundations. The rock anchoring or micro-pile system will be used in areas where site access is limited, or adjacent structures could be damaged as a result of blasting or rock hauling activities. If hard rock is encountered within the planned drilling depth of structure foundations, blasting may be required to loosen or fracture rock. Potential areas requiring blasting will be identified based on geological setting of the proposed alignment. A Blasting Plan will be prepared as part of the COM Plan detailing the general concepts proposed to achieve the desired excavations, proposed methods for blasting warning, use of non-electrical blasting systems, provisions for controlling fly rock, vibrations and air blast damage.

In environmentally sensitive areas with very soft soils, a HydroVac, which uses water pressure and a vacuum, may be used to excavate material into a storage tank. Alternatively, a temporary casing may be used during drilling to hold the excavation open, and then the casing is withdrawn as the concrete is placed in the hole. In areas where it is not possible to operate large drilling equipment due to access or environmental constraints, hand digging may be required.

In areas where monopole (single shaft tubular steel poles) structures are being used, increased volumes of spoils (excavated subsoil), based on foundation size and depth may require spreading beyond the general disturbance area in order to maintain grades and runoff, and to facilitate restoration. In these areas, the topsoil will be salvaged and set aside to be placed over the subsoil material during restoration. These locations will be mitigated on a case by case basis. Spoil material will be used for backfill where suitable, and the remainder will be spread at the tower site or along graded access roads or in locations previously agreed upon by the Applicant and the appropriate land management agencies.

Foundation holes left open or unguarded will be covered to protect the public and wildlife. If practical, fencing may be used. All safeguards associated with using explosives (e.g., blasting mats) will be employed. Blasting activities will be coordinated with the appropriate agencies, particularly for purposes of safety and protection of sensitive areas and biological resources. In extremely sandy areas, water or appropriate land management agencies' approved gelling agent will be used to stabilize the soil before and during excavation

Reinforced-steel anchor bolt cages will be installed after excavation and prior to structure installation. These cages are designed to strengthen the structural integrity of the foundations, and will be assembled at the nearest laydown yard or staging area and delivered to the structure site via flatbed truck. These cages will be inserted in the holes prior to pouring concrete. The excavated holes containing the reinforcing anchor bolt cages will be filled with concrete.

Typically, and because of the remote location of much of the transmission line route, concrete will be provided from portable batch plants set up approximately every 25 miles along the line route in one of the staging areas. Concrete will be delivered directly to the site in concrete trucks with a capacity of up to 10

cubic yards. In the more developed areas along the route, the construction contractor may use local concrete providers to deliver concrete to the site when economically feasible.

Assembling and Erecting Structures with Temporary and Permanent Pad Sites

Conventional Method of Assembly and Erection of Lattice Towers

Bundles of steel members and associated hardware (and often-times insulators, hardware, and stringing sheaves) will be transported to each structure site by truck. Wood blocking is hauled to each location and laid out; the tower steel bundles are opened and laid out for assembly by sections and assembled into subsections of convenient size and weight. Typically, the leg extensions for the structures are assembled and erected by separate crews with smaller cranes to make ready for setting of the main structure assembly. The assembled subsections are then hoisted into place by means of a large crane and fastened together to form a complete tower. A follow-up crew then tightens all the bolts in the required joints. Refer to Figure 8 for a general illustration of this procedure.

Helicopter Method of Assembly and Erection (optional)

When helicopter construction methods are employed, the structure assembly activities will be based at a fly yard, which is a previously identified material staging area. The fly yards will be approximately 10 to 15 acres and will be sited typically at about 5 mile intervals within the section of the line employing helicopter erection. Optimum helicopter methods of erection will be used. Bundles of steel members and associated hardware for up to 15 to 20 structures (generally to include insulators, hardware, blocking, stringing sheaves, etc.) are transported to the appropriate fly yard by truck and stored. The steel bundles are opened and laid out by component section and then assembled into assemblies of convenient size and weight according to the helicopter's lifting capabilities. The leg extensions are typically transported to the structure location and assembled and erected in place (with smaller equipment) in preparation for flying the completed structure sections to each location. After a planned quantity of structures are completely assembled, the helicopter and support force are mobilized to the project and within a few days will set all the planned structures within a given section. A follow up crew will then tighten all the bolts in the joints.

A helicopter may be used to move personnel and equipment (e.g., pulling lines and assembling towers). Helicopters will set down in areas previously identified to receive temporary disturbance such as fly yards and staging areas. Travelers may be dropped at pulling and tensioning sites or other work areas previously described. Spill protection measures will be in place and all Federal Aviation Administration regulations will be followed. Notification will be made to coordinate the air space with other possible helicopters or aircraft in the area (i.e., seeding operations, fire support, and Military Operation Areas).

If needed, additional temporary use sites within close proximity or on the ROW will be identified by the contractor and approved by the appropriate land management agencies for landing and refueling the helicopter. When and where required, prior to and during landing and refueling, a biological monitor will be dispatched to the site to clear sensitive species. Each fuel truck will be equipped with automatic shutoff valves and will carry spill kits. In addition to the required preventive spill measures, a water truck may be required to spray the site to reduce dust. The contractor will be required to clean-up any materials released on the ROW. Any accidental spills will be handled according to the guidelines presented in a Hazardous Materials Management Plan.

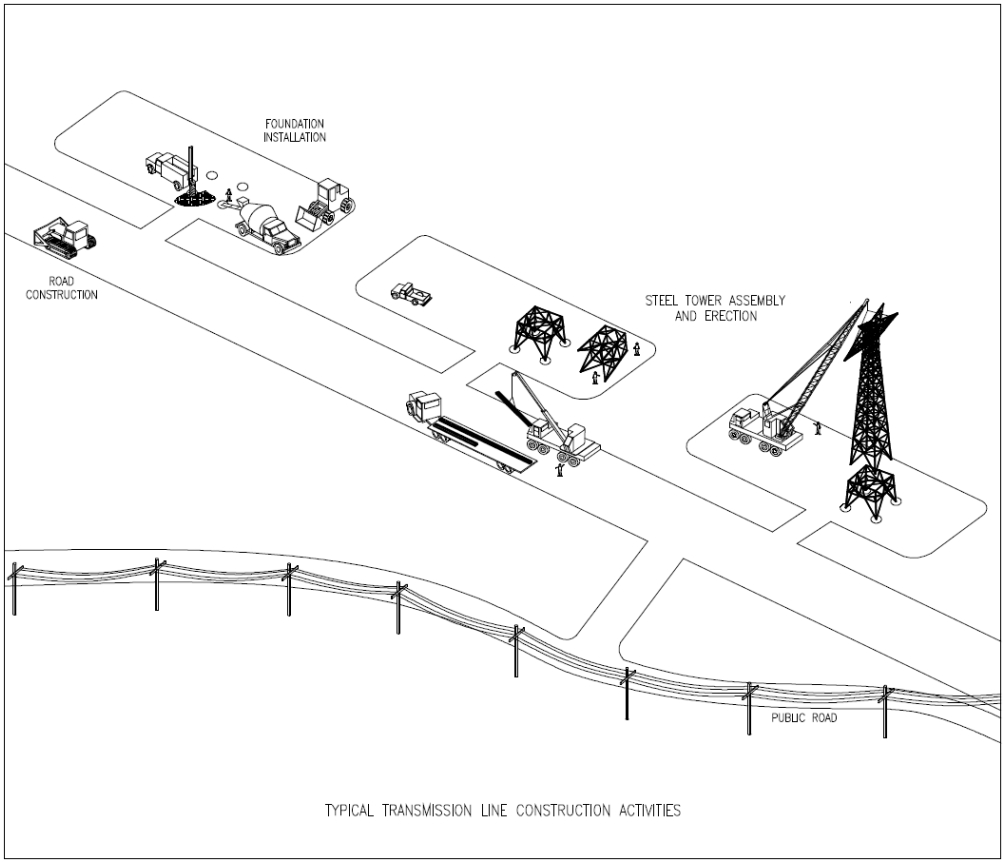
String Conductors, Ground Wires and Fiber Optic Cable

Insulators, hardware, and stringing sheaves will be delivered to each structure site. The structures will be rigged with insulator strings and stringing sheaves at each ground (shield) wire and conductor position.

For protection of the public during wire installation, guard structures will be erected over highways, railroads, power lines, structures, and other barriers. Guard structures will consist of H-frame wood poles placed on either side of the barriers or by using boom trucks raising a guard cross beam. These structures will prevent ground wires, conductors, or equipment from falling across obstacles. Equipment for erecting guard structures will include augers, backhoes, line trucks, boom trucks, pole trailers, and cranes. Guard structures may not be required for small roads. In such cases, other safety measures such as barriers, flagmen, or other traffic controls will be used. Following stringing and tensioning of all ground wires and conductors, the guard structures will be removed and the area restored.

Pilot lines will be pulled (strung) from structure to structure by either a helicopter or land operated equipment, and threaded through the stringing sheaves at each tower. Following pilot lines, a stronger, larger diameter line will be attached to conductors to pull them onto towers. This process will be repeated until the shield wire, OPGW, or conductor is pulled through all sheaves.

Figure 8 - Foundation Installation, Tower Assembly, and Tower Erection

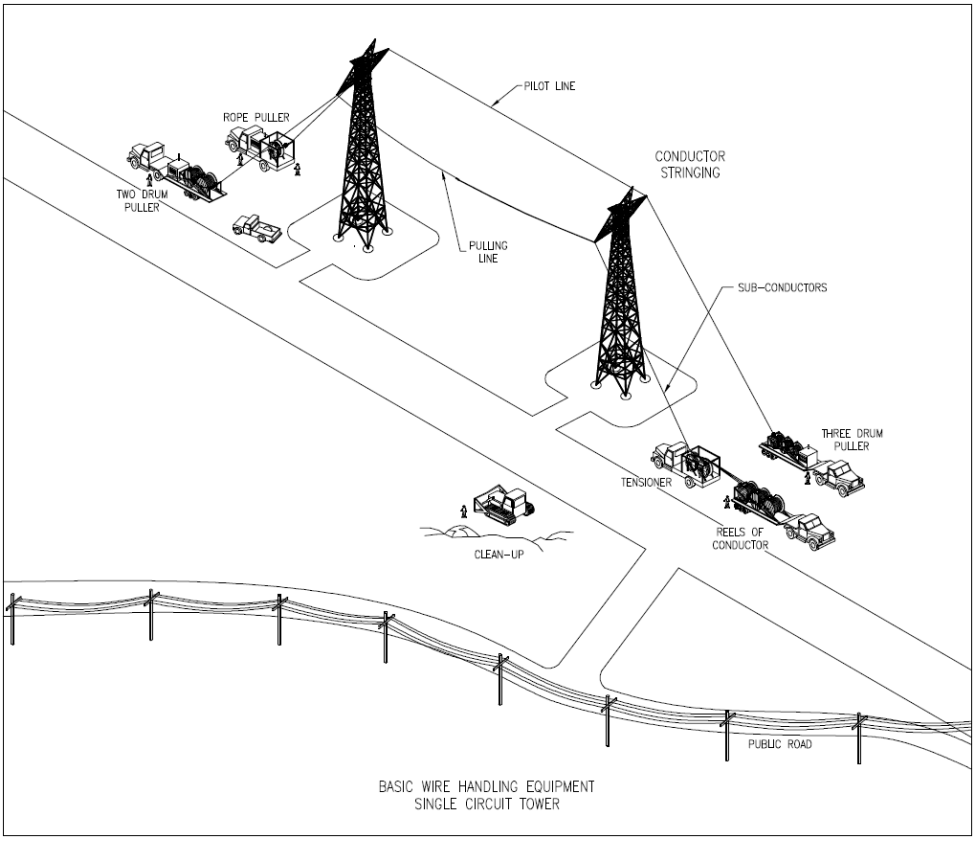


Shield wires, fiber optic cable, and conductors will be strung using powered pulling equipment at one end and powered braking or tensioning equipment at the other end of a conductor segment. Sites for tensioning equipment and pulling equipment will be approximately 2 miles apart and will be identified in the COM Plan. The tensioning and pulling sites will typically be 3.5 acres each in size and approximately 250 feet by 600 feet in area dimensions. These sites may differ in size and dimensions, however, depending on the structure's purpose (e.g., mid-span or dead-end) and site specific topographic conditions. Tensioners, pullers, line trucks, wire trailers, dozers, pickups, and tractors needed for stringing and anchoring the ground wire or conductor will be located at these sites. The tensioner, in concert with the puller, will maintain tension on the ground wires or conductor while they are fastened to the towers. Once each type of wire had been pulled in, the tension and sag will be adjusted, stringing sheaves will be removed and the conductors will be permanently attached to the insulators.

Tension will be maintained on all insulator assemblies to ensure positive contact between insulators, thereby avoiding sparking. Caution also will be exercised during construction to avoid scratching or nicking the conductor surface, which may provide points for corona to occur. Refer to Figure 9 for a general illustration of this procedure.

At tangent and small angle structures, the conductors will be attached to the insulators using clamps while at the larger angle dead-end structures the conductors are cut and attached to the insulator assemblies by "dead-ending" the conductors, either with a compression fitting or an implosive type fitting. Both are industry recognized methods. When utilizing the implosive type fitting, relevant land management agencies, private land owners and public safety organizations will be notified before proceeding with this method.

Figure 9 - Typical Transmission Line Conductor Stringing Activities



Installing Counterpoise (Structure Grounds) Where Needed

Part of standard construction practices prior to conductor installation will involve measuring the resistance of the ground to electrical current near the structures. If the measurements indicate a high resistance, counterpoise will be installed, which will consist of trenching in-ground wire to a depth of 12 inches in non-cultivated land and 18 inches in cultivated land, with a ground rod driven at the end. The counterpoise will be contained within the limits of the ROW and may be altered or doubled back-and-forth to meet the requirements of the proposed Project. Typical equipment used for installing ground rods includes line trucks, backhoes, and trenchers, etc.

Clean-up and Restoration of Affected Areas

Construction sites, material storage yards, and access roads will be kept in an orderly condition throughout the construction period. Refuse and trash will be removed from the sites and disposed of in an approved manner (e.g., in an approved landfill). In remote areas, trash and refuse will be removed to a construction staging area and contained temporarily until such time as it can be hauled to an approved site. No open burning of construction trash will occur. Contaminants such as oils, hydraulic fluids, antifreeze, and fuels will not be dumped on the ground, and all spills will be cleaned up. A Hazardous Materials Management Plan will be prepared with the COM Plan.

The ROW will be restored as near to its original condition as practicable when construction is complete.

4.3.2 Substation/Converter Station Construction

Construction of the substation/converter station will initially consist of survey work, geotechnical sample drillings approximately 20 to 50 feet deep, and soil resistivity measurements that will be used in the final design phases of the station. Once the near final design of the station has been completed, a civil contractor will mobilize to perform site development work, including grubbing and then reshaping the general grade to form a relatively (1 percent slope) flat working surface. This effort also will include the all-weather access roads. An 8-foot-tall chain link fence will be erected around the perimeter of the substation/converter station to prevent unauthorized personnel from accessing the construction and staging areas. The perimeter fence will be a permanent feature to protect the public from accessing the substation/converter station. The excavated and fill areas will be compacted to the required densities to allow structural foundation installations. Oil containment structures required to prevent oil from transformers, reactors, circuit breakers, etc., from getting into the ground or water bodies in the event of rupture or leak, will be installed.

Following the foundation installation, underground electrical raceways and copper ground grid installation will take place, followed by steel structure erection and area lighting. The steel structure erection will overlap with the installation of the insulators and bus bar, as well as the installation of the various high-voltage apparatus typical of an electrical substation. The converter valve hall and ancillary buildings will be erected. The installation of the high-voltage transformers will require special high-capacity cranes and crews (as recommended by the manufacturer) to be mobilized for the unloading, setting into place, and final assembly of the transformers. While the above mentioned activities are taking place, the enclosure that contains the control and protection equipment for the substation/converter station will be constructed, equipped, and wired. A final crushed rock surfacing will be placed on the subgrade to make for a stable driving and access platform for the maintenance of the equipment. After the equipment has been installed, testing of the various systems will take place, followed by electrical energization of the facility. The energization of the facility generally is timed to take place with the completion of the transmission line work and other required facilities.

4.3.3 Ground Electrode Construction

Construction of the two ground electrode facilities will initially consist of survey work, to layout the location of the control building and deep earth wells. The Construction Contractor will mobilize to perform site development work including grubbing and development of access roads to each of the deep earth wells and control building. Grubbing, grading and contouring of the entire site is not required.

A network of 40 to 80 deep earth wells in a circular arrangement approximately 5000 feet in diameter will be drilled to a depth of 100 to 1000 feet in depth. Spoils and excess grout material will be removed from the site. Upon completion of well drilling precast utility access type vaults are installed at each well head for access and installation of electrical connections. A small prefabricated control building will be set on a site prepared foundation and low voltage electrical underground cables will be installed from each deep earth well to the control building. (See Figures 5 and 6).

SECTION 5.0 - MAINTENANCE AND OPERATION

Section 5 provides information describing ongoing and long-term activities that will occur along the ROW. This information includes a discussion on permitted uses, ROW safety requirements, inspection and maintenance, long-term access, signage, and contingency planning.

5.1 COMPATIBLE USES

After construction, compatible uses in the ROW on federal and state land will be considered and approved by The Applicant and the appropriate land management agencies. Examples of compatible uses within the ROW include grazing, vehicle and pedestrian access, recreational use, and pre-existing compatible uses. Examples of prohibited uses include buildings or closed structures frequented by humans such as residences, and any use that requires changes in surface elevation that affect electrical clearances of existing or planned facilities. Compatible uses within easements on private land crossed by the transmission line will be similar to those on the federal land and subject to the discretion of the Applicant.

5.2 ROW SAFETY REQUIREMENTS

The design, operation, and maintenance of the TWE Project will meet or exceed applicable criteria and requirements outlined by the Federal Energy Regulatory Commission (FERC), WECC, NESC, and U.S. Department of Labor Occupational Safety and Health Standards for the safety and protection of landowners, their property, and the general public. The transmission line will be protected with power circuit breakers and line relay protection equipment. If a conductor failure occurs, power will be automatically removed from the line. Lightning protection will be provided by overhead ground wires on the top of the line. Where vegetation presents a potential hazard, trees will be trimmed or cut to prevent accidental grounding contact with conductors.

5.2.1 Building and Fence Grounding

In order to mitigate possible electric shock caused by electrostatic and electromagnetic induction, all buildings, fences, and other structures with metal surfaces located within [tbd] feet of the centerline of the ROW will be grounded to the mutual satisfaction of the parties involved. Typically, residential buildings located [tbd] feet from the centerline will not require grounding. Other buildings or structures beyond [tbd] feet from the centerline will be reviewed in accordance with NESC to determine grounding requirements. All metal irrigation systems and fences that parallel the transmission line for distances of [tbd] feet or more, within [tbd] feet of the centerline will be grounded. All fences that cross under the transmission line also will need to be grounded. This procedure will be included in the construction specifications, and if grounding is required outside the ROW, temporary use permits or landowner consent will be obtained as necessary.

5.3 INSPECTIONS AND MAINTENANCE

The transmission line will be inspected annually or as required, by using fixed-wing aircraft, helicopters, ground vehicles, all terrain vehicles, or on foot. Maintenance will be performed as needed, and the

comfort and safety of land users and local residents will be provided for by limiting noise, dust, and the danger caused by maintenance vehicle traffic. Where access is required for non-emergency maintenance and repairs, the same precautions against ground disturbance that were taken during the original construction will be followed, and restrictions and mitigation measures applicable during initial construction will be followed in areas of critical biological concern. A Biological Protection Plan will be prepared with the COM Plan.

In the event of an emergency, crews will be dispatched quickly to repair or replace any damaged equipment. Every attempt will be made to contact the agency or landowners along the ROW. In the event notification cannot be made, repair operations will proceed only in the case of an emergency situation. Repair of the line will have priority under emergency conditions, and reasonable efforts will be made to protect plants, wildlife, and other resources. Restoration and restoration procedures following completion of repair work will be similar to those prescribed during construction.

Emergency repair may require the same types of equipment used during construction, including power augers for hole drilling, backhoes for excavation, and/or concrete trucks and cranes for structure erection. Other required equipment may include power tensioners, pullers, wire trailers, crawler tractors, and trucks and pickups for hauling materials, tools, and men. Under certain conditions, a helicopter may be used to haul in material and erect towers or string conductor in those areas where access and/or terrain conditions preclude the use of conventional methods. Site and access road disturbances such as ruts created during emergency operations will be restored to satisfactory condition using rehabilitation procedures.

Maintenance crews will trim trees and vegetation, where necessary, to prevent accidental grounding contact with conductors. In most areas, accepted standard utility practices such as repeated tree trimming and brush removal will be followed to maintain the ROW. Generally, trees over 15 feet in height and within 55 feet of the transmission centerline may need to be selectively removed or trimmed to provide the required electrical line clearance. The Applicant will comply with agency requirements regarding management of noxious weeds within the ROW, along access roads, and at temporary use areas in accordance with a Noxious Weed Management Plan, prepared with the COM Plan. Chemical treatment within or adjacent to the ROW generally will be limited only to areas with noxious weeds, and only if absolutely necessary and in accordance with a Noxious Weed Management Plan. Should the use of herbicides or pesticides be necessary, only U.S. Department of Agriculture recommended and Environmental Protection Agency approved products will be used, and only upon prior approval of the authorized officer or owner.

If during transmission line maintenance and monitoring, it is determined that new or reconstruction activities should be implemented, the Applicant will notify the BLM, property owners, and/or other regulatory agencies, and obtain proper approvals, as necessary.

Dust control, during maintenance of the transmission line, will be managed the same as during construction.

The substation/converter stations and all equipment will be patrolled and monitored by maintenance personnel on a routine basis. If a large volume of a contaminate were to leak from a piece of electrical equipment, an alarm or a failure will occur notifying the operations center of the problem, and a trained maintenance crew will be dispatched to the substation/converter station immediately to begin repairs and cleanup.

5.4 RADIO OR TELEVISION INTERFERENCE

The Applicant will respond to complaints of radio or television interference generated by the transmission line by investigating the complaints and implementing appropriate mitigation measures if necessary. The transmission line will be patrolled on a regular basis so that damaged insulators or other components, which can cause interference, are repaired or replaced.

5.5 LONG-TERM ACCESS TO AND ALONG THE ROW

Authorized access roads will only be used for maintenance purposes upon completion of construction. Where long-term access is required for maintenance of the line, The Applicant shall maintain the approved access roads in a safe, useable condition, as directed by an authorized officer from the appropriate land management agency. (A regular maintenance program may include, but is not limited to blading, ditching, culvert installation, and surfacing.)

If snow removal is necessary, equipment used shall be equipped with shoes to keep the blade 2 inches off the road surface in order to avoid damage to it. Where the ground is uneven at drainage crossings, special precautions will be taken in order to ensure equipment blades do not destroy vegetation.

5.6 SIGNAGE AND MARKERS

At this time no specific locations have been identified for aerial line markers; however, bird flight diverters may be placed on the shield wire/fiber optic cable. Warning signs will be placed on towers and at substation/converter stations marking high-voltage danger areas per industry standards.

5.7 ONGOING STUDIES

During the operation and maintenance phase of the TWE Project, the Applicant may conduct ongoing studies to monitor selected environmental factors related to biological resources and public health and safety. Operation and maintenance phase mitigation requirements will be developed.

5.8 CONTINGENCY PLANNING

A representative will be selected by the Applicant to provide routine and emergency planning for situations such as power outages, equipment upgrades, and fire control. The designated representative will have the authority to receive and carry out instructions from the appropriate land management agencies.

5.9 EMERGENCY PROCEDURES

Emergency response procedures will be implemented for the following potential events, or similar events:

- downed transmission lines, structures, or equipment failure
- fires
- sudden loss of power
- natural disasters
- serious personal injury

5.10 TERMINATION AND RESTORATION

Should the ROW and facilities no longer be needed, a termination and restoration plan will be developed by the ROW grant holder. One year prior to termination of the ROW, the holder shall contact the appointed BLM authorized officer to arrange a joint inspection of the ROW. This inspection will be held in order to agree to an acceptable termination and rehabilitation plan. The BLM authorized officer must approve the plan in writing prior to commencement of any termination activities.

Restoration and termination procedures will attempt to restore and reclaim the landscape as near to original conditions as possible. The termination and restoration plan will be reviewed and approved by the appointed authorized officer and will include the following information:

- What facilities and access routes are to be removed, restored, and/or rehabilitated
- How facilities and access routes will be removed, and the disturbed areas restored
- The time of year the facilities and access routes will be removed
- Stabilization and restoration techniques to be used during restoration

SECTION 6.0 - ENVIRONMENTAL RESOURCES AND MITIGATION

(The resource specific information presented in this section is preliminary and subject to change throughout the NEPA process.)

6.1 OVERVIEW AND PURPOSE

This section of the amended Preliminary POD describes the framework for the environmental compliance program which will be implemented for the TWE Project.

The BLM and Western are currently in the NEPA pre-scoping phase for the TWE Project. The EIS will address a range of environmental resources potentially affected by the TWE Proposed Project corridor and alternative corridors considered by the agencies in the NEPA process. A preliminary list of resource topics is listed below. These and other potential environmental resource concerns will be further identified through NEPA scoping, environmental studies, and further input from agencies.

- Geology and Soils
- Groundwater, Surface Water and Wetlands
- Vegetation and Soils Management – including Noxious Weeds and Invasive Weeds
- Ecological Resources, including special status and sensitive species
- Cultural Resources – including historic and archaeological
- Cultural Resources – tribal traditional
- Paleontological Resources
- Land Use – including private and public land uses, recreation
- Visual
- Air Quality
- Noise
- Corona Effects
- Public Health and Safety
- Hazardous Materials, Waste and Wastewater Management
- Fire Protection

Following the completion of the FEIS and issuance of federal permitting agencies Records of Decision(s) (RODs), the Applicant will prepare a COM Plan which will incorporate the stipulations and conditions of each agency. The COM Plan will be provide information on the TWE Project design, construction, operation and maintenance, and environmental mitigation measures that will be used and implemented by construction contractors and personnel.

A preliminary list of plans to be incorporated into the COM Plan include the following:

- Mitigation Monitoring Plan
- Access Road Plan
- Flagging, Fencing and Signage Plan
- Erosion, Dust Control and Air Quality Plans
- Blasting Plan
- Vegetation Management Plan (Plant Removals and Selective Clearing Plans)
- Biological Protection Plan
- Wetlands and Waters of the U.S. Mitigation Plan (CWA, Section 404 Permit)

- Noxious Weed Management Plan
- Pesticide Use Plan
- Storm Water Pollution Prevention Plan
- Cultural Resources Treatment Plan
- Hazardous Materials Management Plan
- Health and Safety Plan
- Termination and Restoration Plan
- Clean-up Work Management Plan
- Spill Prevention Notification and Clean Up Plan
- Fire Protection Plan

6.2 MITIGATION MEASURES

Two types of mitigation measures will be developed during the EIS process and will be included as conditions in the ROD, assumed to approve the TWE Project and subsequent ROW grant. These include generic mitigation and selectively committed mitigation measures, as described below.

Generic mitigation measures are those that apply to the TWE Project as a whole and to some extent serve as part of the overall project description, including design and construction parameters. These measures typically address general environmental impacts or broader policies and regulatory requirements. Table 6-1 identifies a list of generic mitigation measures identified to reduce impacts to environmental resources. These measures are organized by major resource topics. Table 6-1 further identifies the phase(s) during which each measure would be implemented: P – planning and engineering design; C – construction; O – Operation and Maintenance.

Selective mitigation measures address specific environmental impacts or localized conditions and are prescribed on a case by case basis. As the Project progresses, generic and selective mitigation measures will further identified and refined, accordingly, in order to conform with Best Management Practices (BMPs) as identified in agency management plans. TWE has identified numerous BMPs from each applicable Resource Management Plan (RMP) and Forest Plan within the TWE Project study area. Typically, the applicability of selective mitigation measures and BMPs to a given action is determined in the course of the environmental analysis and during the engineering and design phase of a project. TWE will continue to review BMPs in connection with the environmental and engineering studies for the proposed and alternative transmission line routes identified for the TWE Project and prepare updated tables identifying generic and selective mitigation measures for the Project.

TWE will work with the agencies to implement these generic and selective mitigation measures that are appropriate for the TWE Project to minimize potential impacts environmental resources.

TABLE 6-1 TWE PROJECT PRELIMINARY LIST OF APPLICANT- COMMITTED MITIGATION MEASURES			
No.	Timing	Topic	Description of Measure
			GENERAL MEASURE
1	P	General, compliance with agency stipulations and RODs	The TWE Project will be planned, constructed, operated and decommissioned in accordance with the agencies' Records of Decision (ROD), the BLM's ROW Grant stipulations, USFS Special Use Permit stipulations and requirements of other permitting agencies.
2	P	General, compliance with laws and regulations	The Applicant will comply with all applicable environmental laws and regulations. Applicable laws and regulations may include, but are not limited to, the Clean Water Act Section 303(d) and Section 404; the Wild and Scenic Rivers Act, Section 3(a) or 2(a) ii; the Endangered Species Act (ESA), Section 7; the National Historic Preservation Act (NHPA), Section 106, the Native American Graves Protection and Repatriation Act (NAGPRA). Compliance with all applicable laws and regulations will be documented in the Final POD/COM Plan.
3	P	General, mitigation monitoring plan	The COM Plan will include a mitigation monitoring plan that will address how each mitigation measure, required by permitting agencies in their respective decision documents and permits, will be monitored for compliance.
4	P	General, environmental training	Prior to construction, all personnel will be instructed on the protection of cultural, paleontological, ecological resources, and other natural resources, in accordance with the COM Plan provisions. To assist in this effort, the construction contract would address (a) Federal, State, and tribal laws regarding cultural resources, fossils, plants, and wildlife, including collection and removal; and (b) the importance of these resources and the purpose and necessity of protecting them.
			PROJECT DESIGN, ACCESS AND CONSTRUCTION
5	P	General, compliance with laws and regulations	The COM Plan will display the location of project infrastructure (i.e. towers, access roads, substations) and identify short-term and long-term land and resource impacts and the mitigation measures that will be implemented for site-specific and resource-specific environmental impacts.
6	P	General, access road plan	The COM Plan will include an access road plan that incorporates relevant agency standards regarding road design, construction, maintenance and decommissioning. The access road plan will incorporate best management practices, stipulated by the agencies in their respective decision documents and permits.
7	P	Access, visual	The alignment of any new access roads will follow the designated area's landform contours where practical, providing that such alignment does not additionally impact resource values. This will minimize ground disturbance and reduce scarring (visual contrast).
8	P, C,	Access, tower placements, surface water, vegetation management, drainage, dust control	Crossings of streams and waterways will be done in compliance with federal, state and local regulations. Roads will be built as near as possible at right angles to the streams and washes (Arizona crossing). Culverts will be installed where necessary. All construction and maintenance activities will be conducted in a manner that will minimize disturbance to vegetation, drainage channels, and intermittent or perennial stream banks. In addition, road construction will include dust-control measures during construction in sensitive areas. All existing roads will be left in a condition equal to, or better than, their condition prior to the construction of the transmission line. Towers will be sited with a minimum distance of 200 feet from streams wherever possible.
9	C, O	Access	All construction vehicle movement outside the ROW normally will be restricted to pre-designated access or public roads.
10	P, C	General ROW, visual	The areal limits of construction activities will normally be predetermined, with activity restricted to and confined within those limits. No paint or permanent discoloring agents will be applied to rocks or vegetation to indicate survey or construction activity limits.
11	P, C,	Access, visual	In construction areas where recontouring is not required, vegetation will be left in place, wherever possible, and original contour will be maintained to avoid excessive

TABLE 6-1 TWE PROJECT PRELIMINARY LIST OF APPLICANT- COMMITTED MITIGATION MEASURES			
No.	Timing	Topic	Description of Measure
			root damage and to allow for respouting.
12	P, C, O	Access, soils, vegetation, water, cultural visual resources	Except for repairs necessary to make roads passable, no widening or upgrading of existing access roads will be undertaken in the area of construction and operation, where soils or vegetation are sensitive to disturbance. In designated areas, structures will be placed to avoid sensitive features such as, but not limited to, riparian areas, water courses and cultural sites, or to allow conductors to clearly span the features within limits of standard structure design. This will minimize the amount of disturbance to the sensitive feature or reduce visual contrast.
13	C	Vegetation management, restoration, erosion control	In construction areas (e.g., marshalling yards, tower sites, spur roads from existing access roads) where ground disturbance is significant or where recontouring is required, surface restoration will occur as required by the landowner or land management agency. The method of restoration will normally consist of returning disturbed areas back to their natural contour, reseeding (if required), cross drains installed for erosion control, placing water bars in the road, and filling ditches.
14	P, C	General, soils, erosion control, visual	The COM Plan will show the location of borrow sites from which material will be obtained. Borrow pits will be stripped of topsoil to a depth of approximately 6 inches. Stripped topsoil will be stockpiled and, upon completion of borrow excavation, spread to a uniform depth of 6 inches over areas of borrow pits from which removed. Before replacing topsoil, excavated surfaces will be reasonably smooth and uniformly sloped. The sides of borrow pits will be brought to stable slopes with slope intersection shaped to carry the natural contour of adjacent undisturbed terrain into the pit to give a natural appearance. When necessary, borrow pits will be drained by open ditches to prevent accumulation of standing water.
15	C	Clean-up	The COM Plan will include a clean up work management plan, and a flagging, fencing and signage plan. Except for permanent survey markers and material that locate proposed facilities, stakes, pins, rebar, spikes, and other material will be removed from the surface and within the top 15 inches of the topsoil as a part of final cleanup. Fences on ROW will be removed where necessary and replaced to the original condition or better when the work is finished. Where existing fences are removed to facilitate the work, temporary fence protection for lands adjacent to the ROW will be provided at all times during the continuation of the contract. Such temporary fence protection will be adequate to prevent public access to restricted areas. Temporary fencing constructed on the ROW will be removed by the Contractor as part of the cleanup operations prior to final acceptance of the completed work.
16	C	Clean-up site restoration water resources, land use	Watering facilities (tanks, natural springs and/or developed springs, water lines, wells, etc.) will be repaired or replaced, if damaged or destroyed by construction activities, to their predisturbed condition as required by the landowner or land management agency.
17	C	Site restoration and clean-up	Existing vegetation such as landscape plants, gardens, and field crops which are damaged by the application of the soil-applied herbicide will be replaced by the Contractor at his expense.
18	C	Site cleanup	The Applicant will pay fair market value to the land management agency for any merchantable forest products that will be cut during ROW clearing. Merchantable forest products will either be removed or stacked at locations determined by the land management agency.

TABLE 6-1 TWE PROJECT PRELIMINARY LIST OF APPLICANT- COMMITTED MITIGATION MEASURES			
No.	Timing	Topic	Description of Measure
			GEOLOGY AND SOILS
19	C	Drainage, soil erosion control	The COM Plan will include an erosion control plan. Grading will be performed to provide adequate drainage around structure and tower sites and sufficient clearance under conductors. Excavated material will be spread around the site from which excavated. Topsoil will be piled separately and replaced after work completion.
			GROUNDWATER, SURFACE WATER AND WETLANDS
20	P	Water quality	As part of the Clean Water Act (CWA) 404 Permit for the TWE Project, the COM Plan will include a wetlands and waters of the U.S. plan, which will incorporate measures to avoid and minimize impacts to wetlands and waters of the U.S to the extent practical. The Com Plan will include a storm water pollution prevention plan. The Applicant will identify all streams in the vicinity of the proposed project sites that are listed as impaired under Section 303(d) of the CWA and develop a management plan to avoid, reduce, and/or minimize adverse impacts to those streams.
21	P	Water quality	The Applicant will obtain a National Pollutant Discharge Elimination System (NPDES) permit from the Environmental Protection Agency (EPA) prior to construction.
22	C	Water quality	Runoff from excavated areas, construction materials or wastes (including truck washing and concrete washes), and chemical products such as oil, grease, solvents, fuels, and pesticides will be controlled. Excavated material or other construction material will not be stockpiled or deposited near or on stream banks, lake shorelines, ditches, irrigation canals, or other areas where run-off could impact the environment.
23	C	Water quality	Washing of concrete trucks or disposal of excess concrete in any ditch, canal, stream, or other surface water will not be permitted. Concrete wastes will be disposed of in accordance with all Federal, State and local regulations.
24	C, O	Surface water, wetlands	Vehicle refueling and servicing activities will be performed in designated construction zones located more than 100 feet from wetlands and streams. Spill prevention and containment measures or practices will be incorporated as needed.
25	P	Dewatering	A dewatering permit will be obtained from the appropriate agencies if required for construction dewatering activities.
			VEGETATION AND SOILS MANAGEMENT
26	P, C	Vegetation management and noxious weeds	The COM Plan will include a vegetation management plan and a noxious weed management plan. The vegetation management plan will address plant removal and selective clearing. The noxious weed management plan will be developed in accordance with appropriate land management agencies' standard, consistent with applicable regulations and agency permitting stipulations for the control of noxious weeds and invasive species (E.O. 13112). Included in the noxious weed plan will be stipulations regarding construction, restoration, and operation (use of weed-free materials, washing of equipment, etc.).
27	C	Vegetation management	In construction areas where recontouring is not required, vegetation will be left in place wherever possible and original contour will be maintained to avoid excessive root damage and allow for resprouting.
28	C	Vegetation management, visual	Clearing will be performed so as to minimize marring and scarring the countryside and preserve the natural beauty to the maximum extent possible. Except for danger trees, no clearing will be performed outside the limits of the ROW.
			ECOLOGICAL RESOURCES
29	P, C	Ecological, special status species	The COM Plan will include a biological protection plan, which will identify important, sensitive, or unique habitats and BLM sensitive, FS sensitive, and state-listed species in the vicinity of the TWE Project. The COM Plan will identify measures to be taken to avoid, minimize or mitigate impacts to these habitats and species.
30	P,D	Ecological, raptors	In applicable areas, the TWE Project will be designed to meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The Sate of the Art in 2006* (Avian Power Line Interaction Committee

TABLE 6-1 TWE PROJECT PRELIMINARY LIST OF APPLICANT- COMMITTED MITIGATION MEASURES			
No.	Timing	Topic	Description of Measure
			(APLIC) 2006).
31	P, C, O	Ecological, special status species	Mitigation measures that will be developed during the consultation period with the BLM and under Section 7 of the Endangered Species Act (1974) will be adhered to, along with mitigation developed in conjunction with state authorities.
32	P, C, T	Ecological, Special status species	Seasonal restrictions may be implemented in certain areas to mitigate impacts on wildlife. With the exception of emergency repair situations, ROW construction, restoration, maintenance, and termination activities in designated areas will be modified or discontinued during sensitive periods (e.g., nesting and breeding periods) for candidate, proposed threatened and endangered, or other sensitive animal species, as required by permitting agencies. Potential seasonal restrictions and avoidance buffers for nesting raptors will be identified in the EIS. The COM Plan, biological protection plan, will incorporate the seasonal restrictions and stipulations contained in the federal agency RODs.
33	P, C	Ecological, Special status species and habitats	Prior to the start of construction, the Applicant will provide training to all contractor and subcontractor personnel and others involved in construction activities where/if there is a known occurrence of protected species or habitat in the construction area. Sensitive areas will be considered avoidance areas. Prior to any construction activity, avoidance areas will be marked on the ground and maintained through the duration of the contract. The Applicant will remove markings during or following final inspection of the project.
34	C	Ecological, special status species and habitats	If evidence of a protected species is found in the project area, the contractor will immediately notify the appropriate land management agencies and provide the location and nature of the findings. The contractor will stop all activity within 200 feet of the protected species or habitat.
			CULTURAL RESOURCES – HISTORIC , ARCHAEOLOGICAL, TRIBAL TRADITIONAL
35	P, C	Cultural resources	In consultation with the appropriate land management agencies and state historic preservation officers (SHPOs), and in accordance with the Programmatic Agreement (PA), a cultural resources treatment plan will be prepared as part of the COMP to address the specific mitigation measures for cultural resources that will be developed and implemented to mitigate any identified adverse effects. These may include Project modifications to avoid adverse impacts, monitoring of construction activities, and data recovery studies.
36	P, C	Native American cultural resources	The Applicant will comply with all laws, policies, and regulations pertaining to consultations with federally recognized Tribes.
37	P	General, cultural	Prior to construction, all construction personnel will be instructed on the protection of cultural resources, including the provisions of Federal, State, and tribal laws regarding cultural resources, including prohibition of collection and removal; and the importance of these resources and the purpose and necessity of protecting them.
			PALEONTOLOGICAL RESOURCES
38	P,C, O	Paleontology	If paleontological resources are known to be present in the project area, or if areas of high potential to contain paleontological material has been identified through the NEPA process and EIS, the Applicant will prepare a paleontological resources management and mitigation plan as part of the COM Plan.
39	P	Paleontology	Paleontological mitigation may be required in areas of greatest disturbance and areas likely to have significant fossils. Preconstruction surveys of such areas may be conducted as agreed upon by the land-managing and lead federal agency.
			LAND USE AND VISUAL RESOURCES
40	P, C, O	Land Use,	On agricultural land, the ROW will be aligned, in so far as practical, to reduce the

TABLE 6-1 TWE PROJECT PRELIMINARY LIST OF APPLICANT- COMMITTED MITIGATION MEASURES			
No.	Timing	Topic	Description of Measure
		agriculture	impact to farm operations and agricultural production.
41	C	Land Use, agriculture	In cultivated agricultural areas, soil compaction by construction activities will be decompacted. Construction activities will occur so as to minimize impacts on agricultural operations.
42	C	Land Use, ranching	In grazing areas, excessive amounts of pine needles left by clearing of trees, will be removed for the ROW and disposed of in a location to prevent harm to grazing domestic animals.
43	C	Access, land use, gates	The COM Plan will include a flagging, fencing and signage plan. Fences and gates will be repaired or replaced to their original predisturbed condition as required by the landowner or the land management agency if they are damaged or destroyed by construction activities. Temporary gates will be installed only with the permission of the landowner or the land management agency, and will be restored to their original predisturbed condition following construction. Cattle guards will be installed where new permanent access roads cut through fences, at the request of the land management agency.
44	P, C, O	Visual	Non-specular conductors and ground wires will be used to reduce potential visual impacts.
45	P, C, O	Tower design and public safety	Towers and/or ground wire will be marked with high-visibility devices where required by governmental agencies (Federal Aviation Administration). Tower heights will be less than 200 feet, where feasible, to minimize the need for aircraft obstruction lighting.
46	P, C, O	Visual resources	The Applicant will comply with federal permitting agency stipulations regarding visual resources.
			AIR QUALITY
47	P, C	Air quality, dust control	The COM Plan will include a dust control and air quality plan. Requirements of those entities having jurisdiction over air quality matters will be adhered to and dust control measures will be developed. Open burning of construction trash will not be allowed unless permitted by appropriate authorities.
48	P, C	Air quality, emissions	The contractor and subcontractors will be required to have and use air emissions control devices on construction machinery, as required by Federal, State or Local regulations or ordinances.
			CORONA EFFECTS
49	P, C, O	Corona	Transmission line materials will be designed to minimize corona. The proposed hardware and conductor will limit the audible noise, radio interference, and TV interference due to corona. Tension will be maintained on all insulator assemblies to assure positive contact between insulators, thereby avoiding sparking. Caution will be exercised during construction to avoid scratching or nicking the conductor surface which may provide points for corona to occur.
50	O	TV, radio Interference	The Applicant will respond to complaints of line-generated radio or television interference by investigating the complaints and implementing appropriate mitigation measures. The transmission line will be patrolled on a regular basis so that damaged insulators or other line materials that could cause interference are repaired or replaced.
			PUBLIC HEALTH AND SAFETY
51	P, C, O	Safety standards	The TWE Project will be designed, constructed, and operated to meet or exceed the requirements of the National Electrical Safety Code (NESC), U.S. Department of Labor, Occupational Safety and Health Standards, and the Applicant's requirements for safety and protection of landowners and their property.
52	O	Induced currents	The Applicant will apply necessary mitigation to eliminate problems of induced currents and voltages onto conductive objects sharing ROW, to the mutual satisfaction of the parties involved.

TABLE 6-1
TWE PROJECT PRELIMINARY LIST OF APPLICANT-
COMMITTED MITIGATION MEASURES

No.	Timing	Topic	Description of Measure
53	P, C	Blasting	The COM Plan will include a blasting plan, which will identify methods and mitigation measures to minimize the effects of blasting, where applicable. The blasting plan will document the proposed methods to achieve the desired excavations, proposed methods for blasting warning, use of non-electrical blasting systems, and provisions for controlling fly rock, vibrations and air blast damage.
54	P, C, O	Noise, electrostatic and EMF	Research studies performed to determine the effects of audible noise and electrostatic and electromagnetic fields will be regularly monitored by the Applicant to ascertain whether these effects are significant.
55	P, C, O	FAA regulations	The TWE Project will be designed to comply with FAA regulations, including lighting regulations, to avoid potential safety issues associated with proximity to airports, military bases or training areas, or landing strips.
56	P	Worker health and safety	As part of the COM Plan, the Applicant will provide a health and safety plan, which will outline measures to protect workers and the general public during construction, operation, and decommissioning of the TWE Project. The plan will identify applicable federal and state occupational safety standards, establish safe work practices, and define safety performance standards.
			HAZARDOUS MATERIALS, WASTE AND WASTEWATER MANAGEMENT
57	P	Hazardous materials	As part of the COM Plan, the Applicant will provide a spill prevention notification and clean up plan (SPNC). The plan will address compliance with all applicable federal, state and local regulations, and will include: spill prevention measures, notification procedures in the event of a spill, employee awareness training, and commitment of manpower, equipment and materials to respond to spills, if they occur.
58	P	Hazardous materials	As part of the COM Plan, the Applicant will provide a pesticide use plan. The plan will address compliance with all applicable federal, state and local regulations.
59	P	Hazardous materials	As part of the COM Plan, the Applicant will provide a cleanup work management plan that has been approved by applicable Federal, State or local environmental regulation agencies. The plan will address on-site excavation of contaminated soils and debris and will include: identification of contaminants, methods of excavation, personnel training, safety and health procedures, sampling requirements, management of excavated soils and debris and disposal methods.
60	C	Waste management	No nonbiodegradable debris will be deposited in the ROW. Slash and other biodegradable debris will be left in place or disposed of in accordance with agency requirements.
61	C, O	Hazardous materials, waste management	As part of the COM Plan, the Applicant will provide a Hazardous Materials Management Plan. Hazardous materials will not be drained onto the ground or drainage areas. Totally enclosed containment will be provided for all trash. All construction waste including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials will be removed to a disposal facility authorized to accept such materials.
62	C, O	Hazardous materials, waste management	Hazardous materials will not be drained onto the ground or into streams or drainage areas. Totally enclosed containment will be provided for all trash. All construction waste, including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials will be removed to a disposal facility authorized to accept such materials.
63	C,O	Hazardous materials	If a reportable release of hazardous substance occurs at the work site, the Contractor will immediately notify the Applicant and all environmental agencies, as required by law. The Contractor will be responsible for the cleanup.
			FIRE PROTECTION
64	P, C	Fire, safety	The COM Plan will include a fire protection plan. The holder or its contractors will notify the BLM of any fires and comply with all rules and regulations administered by the BLM and USFS concerning the use, prevention, and suppression of fires on federal lands,

TABLE 6-1 TWE PROJECT PRELIMINARY LIST OF APPLICANT- COMMITTED MITIGATION MEASURES			
No.	Timing	Topic	Description of Measure
			including any fire prevention orders that may be in effect at the time of the permitted activity. The holder or its contractors may be held liable for the cost of fire suppression, stabilization, and rehabilitation. In the event of a fire, personal safety will be the first priority of the holder or its contractors. The holder or its contractors will: Operate all internal and external combustion engines on federally managed lands per 36 CFR 261.52(j). which requires all such engines to be equipped with a qualified spark arrester that is maintained and not modified. Carry shovels, water and fire extinguishers that are rated at a minimum as ABC-10 pound on all equipment and vehicles. If a fire spreads beyond the suppression capability of workers with these tools, all will cease fire suppression action and leave the area immediately via pre-identified escape routes. Initiate fire suppression actions in the work area to prevent fire spread to or on federally administered lands. If fire ignitions cannot be prevented or contained immediately, or it may be foreseeable that a fire would exceed the immediate capability of workers, the operation must be modified or discontinued. No risk of ignition or re-ignition will exist upon leaving the operation area. Notify the appropriate fire center immediately of the location and status of any escaped fire. Prior to any operation involving potential sources of fire ignition from vehicles, equipment, or other means, weather forecasts and potential fire danger will be reviewed. Prevention measures to be taken each workday will be included in the specific job briefing. Consideration will be given to additional mitigation measures or temporary discontinuance of the operation during periods of extreme wind and dryness. Operate all vehicles on designated roads, or park in areas free of vegetation. Operate welding, grinding, or cutting activities in areas cleared of vegetation within range of the sparks for that particular action. A spotter will be required to watch for ignitions. Only diesel-powered vehicles will be used in areas where excessive heat from vehicle exhaust systems could start brush or grass fires.

SECTION 7.0 – AUTHORIZATION, PERMITS, AND REVIEWS

Table 7-1 is a preliminary list of some of the authorizations, permits, and reviews that may be needed in order for the proposed Project to be constructed. TWE will continue to update the table as the project proceeds through the planning process.

TABLE 7-1
SUMMARY OF POTENTIAL FEDERAL AND STATE PERMITS AND ENVIRONMENTAL REVIEW REQUIREMENTS

Issue	Action Requiring Permit, Approval, or Review	Agency	Permit, License, Compliance, or Review	Relevant Laws and Regulations
FEDERAL				
NEPA Compliance	Federal action: to grant ROW across land under Federal jurisdiction	Lead agency; cooperating agencies	EIS and Record of Decision	NEPA (42 USC 4321); CEQ (40 CFR 1500-1508); DOE NEPA implementing Regulations (10 CFR 1021)
ROW Across Land Under Federal Management	Preconstruction surveys; construction, operation, maintenance, and abandonment	BLM	ROW grant and temporary use permit	Federal Land Policy and Management Act (FLPMA) of 1976 (PL 94-579); 43 USC 1761-1771; 43 CFR 2800
		Forest Service	Special use authorization permit or easement	36 CFR 251
		BIA, tribe	ROW grant across American Indian lands	25 CFR 169
		NPS	Authorization to cross NPS lands	16 USC 5; 36 CFR 14
		Fish and Wildlife Service (FWS)	Special use permit for crossing a national wildlife refuge	50 CFR 25
	"Conversion of use" for a use other than recreation on lands reserved with Land and Water Conservation Fund Act (LWCF) monies	NPS	Review of transmission line corridor to identify conflicts with recreational area	Land and Water Conservation Fund Act, PL 88-578, Section 6(f)(3)
	Construction, operation, maintenance, and abandonment of transmission line across or within highway rights-of-way	Federal Highway Administration	Permits to cross Federal Aid Highway; 4 (f) compliance	Department of Transportation Act, 23 CFR 1.23 and 1.27; 23 USC 109 and 315; 23 CFR 645; 23 CFR 771
Biological Resources	Grant ROW by Federal land-managing agency	FWS	Endangered Species Act compliance by Federal land-managing agency and lead agency	Endangered Species Act of 1973 as amended (16 USC 1531 et seq)
	Protection of migratory birds	FWS	Compliance	Migratory Bird Treaty Act of 1918, 16 USC 703-712; 50 CFR 1
	Protection of bald and golden eagles	FWS	Compliance	Bald and Golden Eagle Protection Act of 1972 (16 USC 668)
Ground Disturbance and Water Quality Degradation	Construction sites with greater than five acres of land disturbed	Environmental Protection Agency (EPA)	Section 402 National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges from Construction Activities	Clean Water Act (33 USC 1342)
	Construction across water resources	USACE	General easement	10 USC 2668 to 2669
	Crossing 100-year floodplain, streams and rivers	USACE	Floodplain use permits	40 USC 961
	Construction in or modification of floodplains	Federal lead agency	Compliance	42 USC 4321 Ex. Ord. No. 11988 Floodplains
	Construction in or modification of wetlands	Federal lead agency	Compliance	42 USC 4321 Ex. Ord. No. 11990 Wetlands
	Potential discharge into waters of the state (including wetlands and washes)	USACE (and states); EPA on tribal lands	Section 401 permit	Clean Water Act (33 USC 1344)
	Discharge of dredge or fill material to a watercourse	USACE; EPA on tribal lands	404 Permit (individual or nationwide)	Clean Water Act (33 USC 1344)
	Placement of structures and construction work in navigable waters of the U.S.	USACE	Section 10 permit	Rivers and Harbors Act of 1899 (33 USC 403)
	Protection of all rivers included in the National Wild and Scenic Rivers Systems	Affected land-managing agencies	Review by permitting agencies	Wild and Scenic Rivers Act (PL 90-542) (16 USC 1271-1287)
	Potential pollutant discharge during construction, operation, and maintenance	EPA	Spill Prevention Control and Countermeasure (SPCC) Plan for substations	Oil Pollution Act of 1990 (40 CFR 112)
Cultural Resources	Disturbance of historic properties	Federal lead agency, State Historic Preservation Officers (SHPO), Advisory Council on Historic Preservation	Section 106 consultation	National Historic Preservation Act of 1966, (16 USC 470) (36 CFR 800)
	Excavation of archaeological resources	Federal land-managing agency	Permits to excavate	Archaeological Resources Protection Act of 1979 (16 USC 470aa to 470ee)
	Potential conflicts with freedom to practice traditional American Indian religions	Federal lead agency, Federal land-managing agency	Consultation with affected American Indians	American Indian Religious Freedom Act (42 USC 1996)
	Disturbance of graves, associated funerary objects, sacred objects, and items of cultural patrimony	Federal land-managing agency	Consultation with affected Native American group regarding treatment of remains and objects	Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001-3002)
	Investigation of cultural and paleontological resources	Affected land-managing agencies	Permit for study of historical, archaeological, and paleontological resources	Antiquities Act of 1906 (16 USC 432-433)
	Investigation of cultural resources	Affected land-managing agencies	Permits to excavate and remove archaeological resources on Federal lands; American Indian tribes with interests in resources must be consulted prior to issuance of permits	Archaeological Resources Protection Act of 1979 (16 USC 470aa to 470ee) (43 CFR 7)

TABLE 7-1
SUMMARY OF POTENTIAL FEDERAL AND STATE PERMITS AND ENVIRONMENTAL REVIEW REQUIREMENTS

Issue	Action Requiring Permit, Approval, or Review	Agency	Permit, License, Compliance, or Review	Relevant Laws and Regulations
	Protection of segments, sites, and features related to national trails	Affected land-managing agencies	National Trails System Act compliance	National Trails System Act (PL 90-543) (16 USC 1241 to 1249)
Paleontological Resources	Ground disturbance on Federal land or Federal aid project	BLM	Compliance with BLM mitigation and planning standards for Paleontological resources of public lands	FLPMA of 1976 (43 USC 1701-1771); Antiquities Act of 1906 (16 USC 431-433)
Air Traffic	Location of towers in regards to airport facilities and airspace	Federal Aviation Administration (FAA)	A "No-hazard Declaration" required if structure is more than 200 feet in height	FAA Act of 1958 (PL 85-726) (14 CFR 77)
			Section 1101 Air Space Permit for air space construction clearance	FAA Act of 1958 (PL 85-726) (14 CFR 77)
Rate Regulation	Sales for resale and transmission services	FERC	Federal Power Act compliance by power seller	Federal Power Act (16 USC 792)
TRIBAL				
UTE				
ROW Encroachment	Encroachment onto Uintah and Ouray Reservation Land	Ute Indian Tribe-BIA Department of Energy and Minerals	ROW easement	25 CFR Part 169
WYOMING				
STATE				
Utility Siting	Primary permitting authority for transmission line siting, county level necessary	PSC	Certificate of Public Convenience and Necessity	WS 37-2-101; PSC-R 202, 204, 205
	Construction of an industrial facility	Industrial Siting Division, Department of Environmental Quality (DEQ)	Industrial siting permit	WS 35-12
ROW Encroachment	Encroachment into state roadway ROW	DOT	ROW encroachment permit	WS 1-26-813
Ground Disturbance and Water Quality Degradation	Construction sites with greater than one acre of land disturbed	DEQ	Storm water permit	WS 35-11
Cultural Resources	Disturbance of cultural resources	SHPO	Potential permit	Wyoming Protocol Agreement
LOCAL				
Land Use	Construction and operation of Transmission Lines	Carbon	Potential special use	
Land Use	Construction and operation of Transmission Lines	Sweetwater	Potential conditional use	Permitted in agricultural zone, Conditional Use Permit in agricultural zone with growth area overlay
Land Use	Construction and operation of Transmission Lines	Uinta		
COLORADO				
STATE				
Utility Siting	Primary permitting authority for transmission line siting, county level necessary	PUC	Certificate of Public Convenience and Necessity	CRS 40-5-101-106; 4 CCR 723-3
ROW Encroachment	Encroachment into state roadway ROW	DOT	Utility/Special use permit	
Ground Disturbance and Water Quality Degradation	Construction sites with greater than one acre of land disturbed	Water Quality Control Division, Department of Public Health and Environment	Storm water permit	5 CCR 1002-61
Cultural and Archaeological Resources	Disturbance of cultural or archrological resources	Office of the State Archaeologist, Office of Archaeology and Historic Preservation	Potential permit	CRS 24-80-401-410
Biological Resources	Habitat modification in wetland or riparian areas	Division of Wildlife	Wildlife certification	CRS 33-5-101-105
LOCAL				
Land Use	Construction and operation of Transmission Lines	Routt	County special use permits	State Land Use Act
Land Use	Construction and operation of Transmission Lines	Moffat	County special use permits	Permitted in non-residential, non-agricultural, and non-open
Land Use	Construction and operation of Transmission Lines	Rio Blanco	County special use permits	State Land Use Act
Land Use	Construction and operation of Transmission Lines	Mesa	County special use permits	
Land Use	Construction and operation of Transmission Lines	Garfield	County special use permits	State Land Use Act
UTAH				

TABLE 7-1
SUMMARY OF POTENTIAL FEDERAL AND STATE PERMITS AND ENVIRONMENTAL REVIEW REQUIREMENTS

Issue	Action Requiring Permit, Approval, or Review	Agency	Permit, License, Compliance, or Review	Relevant Laws and Regulations
STATE				
Permitting Process	Proposed transmission line facility	Resource Development Coordinating Committee	Expedites Review of Permitting Process for all State Agencies	UCA 63-38d-501, UCA 63-38d-504
ROW Encroachment	Encroachment on, through or over state lands	Division of Forestry, Fire, and State Lands	Application approval	UCA Title 65A
Ground Surface Disturbance	Project construction	Public Service Commission (PSC)	Certificate of Public Convenience and Necessity; Approve construction contracts	UCA 54-4-25, R 746-401
	Crossing state lands	Division of Forestry, Fire, and State Lands	Easement onto state lands. Bond may be required.	UCA 65A-7-8, R 652-40
Cultural, Paleontological, and Biological Resources	Crossing state lands	Division of Forestry, Fire, and State Lands	Provide a cultural and/or paleontological and/or biological survey and submit procedures for reasonable mitigation actions	R 652-40-500
Historical and Cultural Review	Impact on historical sites	Division of State History	Notification of Planning Stage and before Construction	UCA 9-8-306
Archaeological Resources	Survey or excavation of archaeological resources on lands owned or controlled by the state	Governor's Public Lands Policy Coordinating Office	Permit to survey or excavate	UCA 9-8-305, R 694-1
Encroachment on State Park Lands	Utility easement on state park lands	Division of Parks and Recreation	Agreement for Granting and Maintenance of Easements or Rights-of-Way across Park Lands	UCA 63-11-10.3
Air Quality	Construction and operation	Air Quality Board	Notice of Construction	UCA 19-2-108
Water Resources	Construction and operation	Water Quality Board	Discharge permit, spills	UCA 19-5-101, et. Seq.
Wildlife	Modification of habitat	Division of Wildlife Resources	Easement for Use of State Wildlife Resource lands	UCA Title 23
LOCAL				
Land Use	Construction and operation of Transmission Lines	Daggett	Potential conditional use	Hearing not required; if it does, it must occur within 30 days of application
Land Use	Construction and operation of Transmission Lines	Uintah	Potential conditional use	County rules and regulations
Land Use	Construction and operation of Transmission Lines	Duchesne	Potential conditional use	Permitted in all zones, except residential 1/2 acre minimum lot size
Land Use	Construction and operation of Transmission Lines	Wasatch	Potential conditional use	Wasatch County Land Use and Development Code 16.23
Land Use	Construction and operation of Transmission Lines	Utah	Potential conditional use	Utah County Zoning Ordinance 3-45, 7-24-D
Land Use	Construction and operation of Transmission Lines	Juab	Potential conditional use	Juab County Zoning Ordinance 12-1-15
Land Use	Construction and operation of Transmission Lines	Sanpete	Potential conditional use	Sanpete County Land Use Ordinance 14.68
Land Use	Construction and operation of Transmission Lines	Carbon	Potential conditional use	The Development Code of Carbon County, Utah 5.1.2, 5.5.3, 5.14
Land Use	Construction and operation of Transmission Lines	Grand	Potential conditional use	County rules and regulations
Land Use	Construction and operation of Transmission Lines	Emery	Potential conditional use	The Emery County Zoning Ordinance Article 10, 11-4-4
Land Use	Construction and operation of Transmission Lines	Sevier	Potential conditional use	Permitted in Agricultural, GRF (Grazing, Recreation, and Forestry) zones; Not permitted in Residential-Agricultural zone
Land Use	Construction and operation of Transmission Lines	Millard	Potential conditional use	County rules and regulations
Land Use	Construction and operation of Transmission Lines	Beaver	Potential conditional use	County rules and regulations
Land Use	Construction and operation of Transmission Lines	Piute	Potential conditional use	County rules and regulations
Land Use	Construction and operation of Transmission Lines	Wayne	Potential conditional use	County rules and regulations
Land Use	Construction and operation of Transmission Lines	San Juan	Potential conditional use	County rules and regulations
Land Use	Construction and operation of Transmission Lines	Iron	Potential conditional use	County rules and regulations
Land Use	Construction and operation of Transmission Lines	Iron	ROW encroachment permit	County rules and regulations
Land Use	Construction and operation of Transmission Lines	Washington	Potential conditional use	County rules and regulations
Land Use	Construction and operation of Transmission Lines	Summit	Potential conditional use	County rules and regulations
NEVADA				
STATE				
ROW Encroachment	Encroachment into state roadway ROW	Nevada DOT	ROW encroachment permit	Nevada Revised Statutes (NRS) 408.423, 408.210
Ground Surface Disturbance	Project construction	Nevada Division of Environmental Protection (NDEP)	Registration certificate	Nevada Administration Code (NAC) 445.704
	Construction of electric transmission line	Public Service Commission	Authority to construct and certificate of need	NRS 704.330, NRS 704.820, NRS 704.701
Ground Disturbance	100-year floodplain, streams and rivers, waters of the	NDEP	Floodplain use permits, Clean Water Act 401, 402, and 404 permits	Nevada State Statutes - State Water Quality Certification rules

TABLE 7-1
SUMMARY OF POTENTIAL FEDERAL AND STATE PERMITS AND ENVIRONMENTAL REVIEW REQUIREMENTS

Issue and Water Quality Degradation	**Action Requiring Permit, Approval, or Review** state	**Agency**	**Permit, License, Compliance, or Review**	**Relevant Laws and Regulations**
Storm Water and Water Quality Degradation	Pollution discharge	NDEP	Storm water pollution prevention plans (SWP3) SPCC plan	Nevada State Statutes - State Water Quality Certification rules
Cultural and Paleontological Resources	Crossing state lands	Division of State Lands	Easement onto state lands	NRS 321.001
	Investigation of Paleontological, archaeological, and historic sites	Nevada State Museum	Permit to investigate antiquities	Nevada Antiquities Law (NRS 381.195 to 381.227)
	Disturbance of American Indian burial sites on state and private lands	Nevada State Historic Preservation Office	Notification of discoveries, consultation with affiliated groups	Nevada Protection of Indian Burial Sites (NRS 383.150) (NRS 383.190)
Air Quality	Construction and operation	NDEP	Authority to construct, permit to operate	NRS 445
Biological Resources	Modification of sensitive plant species habitat	Division of Forestry	Compliance to survey for identification of plant species	NRS 527.270, NRS 527.050
	Disturbance of special status plant species	Division of Forestry	Permit for lawful take of protected plant	NRS 527.250
	Construction and operation in areas of rare and endangered animal species	Division of Wildlife	Compliance	NRS 501, NAC 503
	Modification of habitat of threatened and endangered species	Division of Wildlife	Special permit	NAC 5-4.510 through 4.550
LOCAL				
Land Use	Construction and operation of Transmission Lines	Lincoln		
Land Use	Construction and operation of Transmission Lines	Clark	Potential conditional use	
Land Use	Construction and operation of Transmission Lines	Clark	Conditional special use	

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