



0000166025

# **SunZia Transmission, LLC**

**New Application for a  
Certificate of Environmental  
Compatibility**

**L-00000YY-15-0318-00171**

**PART 2 OF 2**

**BARCODE # 0000166025**

**To review Part 1 please see:**

**BARCODE # 0000166024**

**Exhibit E**

## **EXHIBIT E – SCENIC AREAS, HISTORIC SITES AND STRUCTURES, AND ARCHAEOLOGICAL SITES**

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Pursuant to the ACC Rules of Practice and Procedure R14-3-219, applications for CECs shall include information required as exhibits. Exhibit E reads as follows:

*“Describe any existing scenic areas, historic sites and structures or archaeological sites in the vicinity of the proposed facilities and state the effects, if any, the proposed facilities will have thereon.”*

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### **EXHIBIT E-1 SCENIC AREAS**

Exhibit E1 includes summaries of existing scenic resources, as well as the potential impacts the proposed Project may have on each resource.

#### **Introduction**

This section of Exhibit E addresses the inventory and potential impacts on scenic (visual) resources. In the context of CEC regulations regarding “scenic areas”, the following features were identified and inventoried based on public comment as described in the SunZia Southwest Environmental Impact Statement (EIS) (Exhibit B-1), existing resource management plans, agency scoping, field investigations, and previous National Environmental Policy Act (NEPA)/siting studies. Scenic areas were characterized and described by assessing scenery and sensitive viewers in context with the construction and operation of the SunZia Southwest Transmission Project. The following are key elements, including inventory methodology, landscape scenery inventory, sensitive viewer inventory, impact methodology, scenery impacts, sensitive viewer impacts, and substations within the visual four-mile-wide study corridor.

#### **Methodology**

The methods used to conduct the visual inventory are consistent with and based on the Bureau of Land Management (BLM)’s Visual Resource Management (VRM) Manual (BLM 1986), the SunZia Southwest Transmission Project EIS, and past visual resource studies conducted for similar projects that have been approved by the state siting committee. The visual assessment study area was focused within a four-mile-wide corridor (two miles on either side of the reference centerline of the transmission line route and boundary of the substation siting area). The visual resources inventory was conducted on all land regardless of jurisdiction, including public, state, and private land that may be affected by the Project within the study area. Visual resource data collected within the Project study area was based on aerial photographs,

topographic maps, planning documents, consultation with participating agencies, and field investigations. This data was reviewed and an inventory was conducted to determine the quality of scenery, sensitive viewers and associated viewing conditions. Following are specific processes used to inventory scenery and sensitive viewers.

### **Landscape Scenery**

In the context of this Project, scenery is a measure of the inherent aesthetic value of the landscape (scenery) based on existing landscape features, including landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications (BLM VRM 8400 Series). This definition of scenery was based on, and is consistent with, BLM scenic quality concepts. In determining scenery, discreet landscape units were inventoried by the BLM using GIS within each affected BLM Field Office based on similarities of the landscape features. This data provided adequate coverage within the context of the four-mile-wide Visual Resource study corridor. Generally, landscapes with a greater diversity of landscape features receive a higher rating. Scenic quality rankings for landscape units include three categories: Class A (outstanding), B (above average), and C (common). Please refer to Exhibit A-1, Existing Land Use, for link and milepost references.

### **Sensitive Viewers**

The term *sensitive viewers* refers to specific user groups associated with various land uses that are associated with viewers that have a sensitivity to landscape change and therefore could be affected by the construction and operation of the proposed Project. The sensitivity rating for each sensitive viewer is based on the following five criteria: type of use, volume of use, duration of use, concern for aesthetics, and formal scenic or historic designations. The results of the sensitivity assessment for each identified sensitive viewer can be found in the SunZia FEIS (Exhibit B-1). Sensitive viewers identified within the study area include residences, recreation areas (including trails), and travel routes. Sensitive viewer data was collected within the Project study area based on aerial photographs, planning documents, consultation with participating agencies, and field investigations. Sensitive viewer data was updated for the CEC Application in summer 2015.

High sensitivity viewers (residences, recreation areas, and scenic travel routes) are typically sensitive to changes in the landscape due to longer viewing duration and high expectations for aesthetics. Moderate sensitivity viewers are those that have concern for landscape change but are in transit (e.g. highway and county roads) or the use is not focused on aesthetics (such as off highway vehicle (OHV) users in Hot Well Dunes Recreation Area). Viewing conditions include consideration for distance from a Project, visibility, and viewer elevation.

## **Inventory Results**

### **Landscape Character**

The Project is located within the Sonoran Desert subdivisions of the Basin and Range Province (Fenneman 1931). The Sonoran Desert subdivision is characterized by mountain ranges and intervening desert plains; however, the ranges are smaller, rock pediments are much more prevalent, and undrained basins are less general than those typically characterized by the Basin and Range Province, such as in Nevada. Mountain ranges in the Project area include the Tortolita, Rincon, Santa Catalina, Galiuro, and Pinaleno Mountains. Major ecosystems in the Project area include Palo Verde-Mixed Cacti Desertscrub basins, Chihuahuan semidesert grasslands, semi-arid hills, and piñon-juniper woodland foothills and mixed evergreen forests (Brown 1982a).

Regional landscapes have a range of developed and natural landscapes. More intact and natural appearing landscapes occur in the central portion of the Project area. Topography and vegetation associated with the Pinaleno, Galiuro, and the Santa Catalina mountains, and the San Pedro River Valley provide a more diverse landscape than the surrounding valley plains, which are relatively flat and often uniformly covered with creosote or desert grasslands.

Agricultural activities such as irrigated agriculture occur within the valley plain landscapes in northern Cochise County and southern Pinal County in the Project area.

### **Scenery Inventory**

The majority of the project is located in Class B scenery crossing approximately 134 miles with 64 miles crossing Class C landscapes and one mile of Class A associated with the San Pedro River.

Class B scenery was identified along the Proposed Route in the San Simon (links B160c), Pinaleno Foothills (Link C71 and C110) and the San Pedro Valleys (links C201, C441, and C450), and the Tortolita Foothills (Link C680, C818). These landscapes are characterized by moderately to highly dissected bajadas covered with a wide range of vegetation, including desert cacti, piñon-juniper and oak, and riparian species. Cultural modifications that have locally modified landscapes associated with Class B scenery within these landscapes include high voltage transmission lines (HVTL) (500 kV and 115 kV), pipelines, substations, mining operations, major transportation corridors (e.g., SR 77 & SR 79), local transportation routes, and unpaved roads.

Agricultural lands that associated with the Sulphur Springs Valley north of Willcox (Link C110) and north of Eloy near the Pinal Central Substation (links C880 and C880A) are representative of

Class B lands that exhibit a unique agrarian setting in the arid southwest. Cultural modifications that have locally modified these landscapes include HVTLs (500 kV and 345 kV), Pinal Central Substation, local transportation routes, unpaved roads, and development associated with the agriculture processing facilities north of Eloy.

Class C landscapes crossed by the Proposed Route are associated with the San Simon and Sulphur Springs Valleys and plains south of the Galiuro Mountains (links B160b, B170, C110 and C260, respectively), and in the creosote dominated Upland Sonoran Desert north of the Picacho Mountains (links C670 to C830). Cultural modifications that have locally modified landscapes associated with Class C include HVTLs (500 kV and 345 kV), pipelines, and paved and unpaved roads.

A limited area of Class A landscape crossed by the Proposed Route is associated with the San Pedro River (link 201). These landscapes are characterized by the meandering form of the San Pedro River and the diverse riparian vegetation that is adjacent to and interwoven within the river itself. Cultural modifications that have locally modified landscapes associated with Class A scenery include HVTLs (345 kV), local transportation routes, and unpaved roads.

### **Sensitive Viewer Inventory**

Visual Sensitivity reflects the degree of concern for change in the scenic quality of the natural landscape or existing conditions from a sensitive viewpoint in the study area. Sensitive viewers identified within the study area include residential, recreation, and travel route viewers as described below.

#### Residential

Concentrations of residential viewers, which are associated with a high sensitivity level, are located north of Wilcox in the San Manuel and Oracle area (including Saddlebrooke Ranch), and north Eloy along links C110, C450, C670, C680, and C880a. In these locations, there are residences that occur in close proximity to existing HVTL corridors. Smaller residential concentrations are located in Cascabel along links C261 and C201, Redington (Link C441) and west of Oracle (Link C680). Dispersed low-density rural residences are located in proximity to the aforementioned towns.

#### Recreation

Sensitive recreation viewers associated with the Project include Wilderness Areas, Areas of Critical Environmental Concern (ACEC), National Forest Lands, state park, trails, golf courses, OHV areas, and dispersed recreation. High sensitivity level recreation viewers include portions

of the Peloncillo Mountains Wilderness (including Peloncillo Mountains Wilderness Study Area [WSA] (Link B160b), the Hot Wells Dune OHV area (Link B160b), the Rincon Mountains Wilderness (Links C201 and C441), Oracle State Park (including Bellota Trail Loop, Granite Overlook Trail Loop, Manzanita Trail, Mariposa Trail, Nature Trail Loop, Wildlife Corridor Trail, and the Historic Kannally Ranch House) (Link C670), and the Arizona Trail Trailhead (Tiger Mine) and associated trail (Link C661). Moderate sensitivity level recreation viewers include the Northern Peloncillo Mountains ACEC (Link B160b), portions of the Coronado National Forest (Link C441), A7 Ranch (C441), San Manuel Golf Club, Saddlebrooke Ranch Golf Club, and Pinal County Fairgrounds near links C441, C450, C680, and C880a, respectively.

### Travel Routes

Travel routes with associated scenic, historic, and/or auto tour route designations include Redington Road (Link C441), Control Road (Mount Lemmon Highway FR 38) (Link C661), SR 77, and SR 79 (Pinal Pioneer Parkway). Moderate sensitivity level travel routes include portions of I-10 and US Routes 191 and 287, Fort Grant Road, Three Links Road, Cascabel Road (Link 261), Ocotillo Road, and SR 76 (San Pedro River Road) (Link C441). Moderate sensitivity level recreation access/four-wheel drive roads include Muleshoe Ranch Road (link C260), Black Hills Mine Road/Catalina Ridge (Link C450), and Buehman Canyon Trail.

### **Impact Methodology**

The purpose of the visual impact assessment was to identify and characterize the level of visual change to the landscape and views from sensitive viewers that would result from the construction and operation of the Proposed Route. The following text describes the process used to measure visual contrast and associated visual impacts in context with landscape scenery and sensitive viewers.

Impacts to scenery were assessed based on the scenic quality of the landscape in conjunction with the proposed project's anticipated visual contrast. Visual contrast is defined as the degree of perceived change that would occur in the landscape as a result of the construction, operation, and maintenance of the Proposed Route. In the context of the Project, visual contrast was assessed considering (1) landscape contrast – removal of vegetation (i.e., agricultural crops, orchards, and riparian) in order to prepare the right-of-way for Project access, and to construct and maintain Project facilities, and (2) structure contrast – the introduction of aboveground facilities into the landscape.

Impacts to sensitive viewers were assessed based upon (1) level of visual contrast as previously described (i.e., new line, co-located, or parallel existing linear features), (2) distance from the Project, (3) viewing condition, (4) visibility (screened or backdropped views), and (5) viewer

sensitivity (high or moderate). Generally, for sensitive viewers, as distance from the Project increases, the perception of visual contrast decreases. For this study, Project-specific distance zones were established based on visibility thresholds specific to 500 kV transmission line facilities. Visibility is the perception of form, line, color, texture, and other visual elements in the landscape. These elements become less detailed and obvious as distance from a viewpoint increases.

Impacts are anticipated to be highest where new structures are introduced into the landscape for residential viewers with unobstructed views of the Project within the immediate foreground distance zone. Residences with similar viewing conditions would have reduced impacts where the Project would be co-located with or parallel existing transmission lines, because structure contrast is reduced.

## **Impact Results**

### **Scenery Impacts**

Scenery impacts for the Proposed Route are predominantly Moderate to Moderate-High for Class B landscapes, Low for Class C, and Moderate-High for approximately one mile of Class A landscape associated with the San Pedro River crossing.

Moderate to Moderate-High impacts for Class B landscape were identified in the San Simon (links B160c), the San Pedro Valleys (links C201, C441, and C450), and the Tortolita Foothills (Link C680, C818). These impacts are anticipated to occur within the bajada landscapes where the terrain is moderately dissected and does not parallel existing transmission lines.

Low-moderate impacts are anticipated to occur within Class B scenery where the Project parallels existing transmission lines (Links C71, C110, C212, C260, C680, and C880a). Low-moderate to Low impacts would also occur within Class C scenery associated with valley plains (Links B160b, C110, C260, and C860). Low impacts to Class C scenery are anticipated where the Project would parallel existing transmission lines or pipeline facilities.

### **Residential**

The majority of impacts for residential viewers range from Moderate to Low where the Project is located adjacent to existing transmission lines. In these locations, contrast would be reduced because existing access roads would be used for construction. These residences are located north of Willcox, in the San Manuel and Oracle area, including Saddlebrooke Ranch (refer to simulation Figures G-4-3 and G-4-6 in Exhibit G), and north of Eloy along links C110, C450, C670, C680, and C880a. Moderate to Low impacts were also identified for the smaller

residential concentrations associated with Cascabel and Redington (along links C261 and C201 and Link C441, respectively) and west of Oracle (Link C680). In these locations, the Proposed Project is located over two miles away with partially screened views.

Moderate impacts are anticipated for dispersed residences south of San Manuel (Link C450 and C441). These impacts are based primarily on distance from the Project to the viewer in context with rolling hills which would partially screen the Project. Moderate-High to Moderate impacts are anticipated in limited areas where residences are within 0.5 miles of the Project with partial screening based on topography and vegetation (Rosendo Road residence).

Dispersed residences in agricultural lands north of Willcox and Eloy would have level foreground views of the Project (links C110 and C880a, respectively). However, the Project would be seen in context with existing transmission lines, resulting in Moderate impacts. Moderate-High impacts would occur in limited situations where residences are located between the Proposed Route and existing facilities.

#### Future Residences

The Saddlebrooke Ranch subdivision is expected to expand with an ultimate build-out north of the Proposed Route. Effects are anticipated to be Moderate for high-sensitivity viewers in the future expansion.

#### Recreation

High impacts are anticipated for users of the Arizona National Scenic Trail near the Tiger Mine Trailhead northeast of Oracle (refer to simulation Figure G-4-5 in Exhibit G, Link C670). The Project would cross the trail in rolling terrain with unobstructed views of the Proposed Project. Moderate-high to moderate impacts are anticipated for recreation viewers using Buehman Canyon Trail (Link 441) and nearby A7 Ranch. In this location, the Project would be visible within one mile of the trail in a landscape with few modifications. High to Moderate impacts are also anticipated for recreation access and dispersed users of the Hot Wells Dune OHV Recreation Area, respectively (Link B160b). Impacts are anticipated to range from Low-moderate to low for dispersed recreation users associated with portions of the Peloncillo Mountains Wilderness (including Peloncillo Mountains WSA (Link B160b), the Rincon Mountains Wilderness (Links C201 and C441) and Coronado National Forest (and associated trails/trailheads) (Link C450). For this region of the Project, views would occur in the background (beyond two miles) and would be screened and backdropped by local topography and vegetation, further reducing visibility. Low-moderate to low impacts are anticipated for high sensitivity viewers at Oracle State Park (and associated trails/visitor areas) and Saddlebrooke Ranch Golf Club (refer to simulation Figure G-4-3 in Exhibit G). For these locations (links C661

and C680, respectively), the Project would be located within one mile of the viewers where terrain and vegetation would partially screen the Project. Moderate to Moderate-high impacts are anticipated for the San Manuel Golf Course based on visibility of the project being seen in the context with the existing 115 kV transmission line. Low impacts are anticipated for the Pinal County Fairgrounds due to viewer orientation and the existing transmission and substation facilities.

### Travel Routes

The Project would cross Redington Road (a high-sensitivity travel route – see G-4-2 in Exhibit G), south of Redington (Link C441). High impacts would occur at this crossing where the Project (i.e. transmission towers and access road) would be visible in rolling terrain. Moderate-high impacts are anticipated along SR77 where the Project crosses the road (Link C450). These impacts would remain for a short duration based on the speed associated with each of these roads and angle at which the proposed route would cross the roads. Low-moderate impacts on Pinal Pioneer Parkway (SR 79) are anticipated where the travel route would be crossed by Link C680 (refer to simulation Figure G-4-4 in Exhibit G) immediately adjacent to multiple transmission lines with similar scale and orientation.

Generally, Moderate-high impacts are anticipated for moderate sensitivity travelers using Muleshoe Ranch Road (link C260), Cascabel Road (Link 261) (see G-4-1 in Exhibit G), Black Hills Mine Road/Catalina Ridge (Link C450), Webb Road (Link C450), North Redington Road (Link C450), and Park Link Drive (Link C820). These impacts would remain for a short duration based on the speed associated with each of these roads and angle at which the proposed route would cross the roads. Low-moderate to low impacts are anticipated for travelers along SR 191 (Link C71) due to the Project being seen in context with similar industrial features (i.e. high voltage transmission lines) and screening due to vegetation and topography.

### Substations

#### Willow-500 kV Substation

The proposed Willow-500 kV Substation would be constructed approximately one mile east of Highway 191 (Link C71). The proposed Willow-500 kV Substation footprint would cover approximately 25 acres of Arizona State Trust land used for livestock grazing. The proposed Willow substation is located within Class B scenery that has been modified by two 500 kV transmission lines and impacts to scenery are anticipated to be Low. The only sensitive viewers identified for this site are moderately sensitive viewers from SR 191. Impacts for travelers along

Highway 191 are anticipated to be Low-moderate due to the distance from the road, vegetation screening, and the travel speed for viewers.

#### DC Converter Station (option)

The DC converter station would be located on up to 45 acres east and within one mile of the existing Pinal Substation, if one of the lines is constructed as a DC line. The Converter Station could be sited on agricultural lands or vacant lands classified as Class B lands. Impacts to scenery are anticipated to be low for the converter station because the existing substation and transmission lines are similar in scale and character. Impacts to dispersed residences would range from Moderate to Low based on the final location and proximity to residences and existing substation and transmission lines.

#### References

BLM. Visual Resource Management Manual 8410, 8431. U.S. Department of the Interior, BLM. Available at <http://blm.gov/nstc/VRM/vrmsys.html>.

D.E. Brown, Ed. Biotic communities of the American southwest-United States and Mexico. Desert Plants Vol. 4 Nos 1-4.

Fenneman, Nevin M. 1931. Physiography of Western United States. New York and London 1931.

## **EXHIBIT E-2 HISTORIC SITES AND STRUCTURES AND ARCHAEOLOGICAL SITES**

### Overview

This portion of Exhibit E describes historic sites, structures, and archaeological sites in the vicinity of the proposed facilities as well as potential effects to those sites and structures.

To identify historic sites, structures, and archaeological sites, a review of existing historic and archaeological records was performed for all areas within 1,250 feet of the proposed centerline, for a total width of 2,500 feet. Records at the following agencies and research institutions were reviewed:

- State Historic Preservation Office
- Arizona State Museum (ASM) AZSITE Database

- Bureau of Land Management (BLM) Tucson and Safford Field Offices
- National Register of Historic Places.

**Description of Historic Sites, Structures, and Archaeological Sites**

Based on the records review, approximately 16 percent of the 2,500 foot review area has been previously surveyed for historic or archaeological sites and structures. The records review identified a total of 113 known historic or archaeological sites or structures: 63 prehistoric archaeological sites, 28 historic sites or structures, five multicomponent (historic and prehistoric) sites or structures, and 17 sites or structures of unstated age.

The majority of the prehistoric archaeological sites consist of Native American sites with stone features and/or artifacts. Four of the archaeological sites are Native American village/habitations, and two are Native American rock art sites. The historic sites and structures consist of trash scatters and infrastructure such as roads, canals, transmission lines, trails, and a railroad. The Butterfield Stage Route and the Southern Pacific Mail and Stage Line intersect the project. In addition, one of the historic sites is a Native American (Tohono O’odham) habitation site.

A list of known historic sites and structures and archaeological sites identified in the records review is provided in Table E-2-1.

<b>Table E-2-1. Known Historic Sites, Structures, and Archaeological Sites</b>			
<b>No.</b>	<b>Type</b>	<b>Description</b>	<b>Identifier</b>
<b>1</b>	<b>Archaeological and historic site</b>	<b>Native American artifacts; Historic channel and artifact scatter</b>	<b>AZ AA:3:308(ASM)</b>
2	Archaeological and historic site	Native American cooking/heating feature and artifacts; Historic habitation	AZ CC:8:7(ASM)
<b>3</b>	<b>Archaeological site</b>	<b>Native American artifacts</b>	<b>AZ AA:3:116(ASM)</b>
4	Archaeological site	Native American artifacts	AZ AA:3:128(ASM)
5	Archaeological site	Native American artifacts	AZ AA:3:129(ASM)
6	Archaeological site	Native American artifacts	AZ AA:3:131(ASM)
<b>7</b>	<b>Archaeological site</b>	<b>Native American artifacts</b>	<b>AZ AA:3:137(ASM)</b>
8	Archaeological site	Native American artifacts	AZ AA:3:139(ASM)

**Table E-2-1. Known Historic Sites, Structures, and Archaeological Sites**

<b>No.</b>	<b>Type</b>	<b>Description</b>	<b>Identifier</b>
9	Archaeological site	Native American artifacts	AZ AA:3:28(ASM)
10	Archaeological site	Native American artifacts	AZ AA:3:289(ASM)
11	Archaeological site	Native American artifacts	AZ AA:3:290(ASM)
12	Archaeological site	Native American artifacts	AZ AA:3:295(ASM)
13	Archaeological site	Native American artifacts	AZ AA:3:296(ASM)
14	Archaeological site	Native American artifacts	AZ AA:3:302(ASM)
15	Archaeological site	Native American artifacts	AZ AA:3:303(ASM)
<b>16</b>	<b>Archaeological site</b>	<b>Native American artifacts</b>	<b>AZ AA:3:304(ASM)</b>
<b>17</b>	<b>Archaeological site</b>	<b>Native American artifacts</b>	<b>AZ AA:3:305(ASM)</b>
<b>18</b>	<b>Archaeological site</b>	<b>Native American artifacts</b>	<b>AZ AA:3:306(ASM)</b>
<b>19</b>	<b>Archaeological site</b>	<b>Native American artifacts</b>	<b>AZ AA:3:310(ASM)</b>
<b>20</b>	<b>Archaeological site</b>	<b>Native American artifacts</b>	<b>AZ AA:3:311(ASM)</b>
21	Archaeological site	Native American artifacts	AZ AA:3:312(ASM)
22	Archaeological site	Native American artifacts	AZ AA:3:9(ASM)
23	Archaeological site	Native American artifacts	AZ AA:7:270(ASM)
24	Archaeological site	Native American artifacts	AZ AA:7:491(ASM)
25	Archaeological site	Native American artifacts	AZ AA:7:657(ASM)
26	Archaeological site	Native American artifacts	AZ AA:8:330(ASM)
27	Archaeological site	Native American artifacts	AZ AA:8:332(ASM)
28	Archaeological site	Native American artifacts	AZ BB:5:49(ASM)
29	Archaeological site	Native American artifacts	AZ CC:10:3(ASM)
<b>30</b>	<b>Archaeological site</b>	<b>Native American artifacts</b>	<b>AZ CC:11:17(BLM)</b>
<b>31</b>	<b>Archaeological site</b>	<b>Native American artifacts</b>	<b>AZ AA:3:293(ASM)</b>
32	Archaeological site	Native American artifacts	AZ AA:8:324(ASM)

**Table E-2-1. Known Historic Sites, Structures, and Archaeological Sites**

No.	Type	Description	Identifier
33	Archaeological site	Native American artifacts	AZ CC:9:17(ASM)
<b>34</b>	<b>Archaeological site</b>	<b>Native American artifacts</b>	<b>AZ CC:9:52(ASM)</b>
35	Archaeological site	Native American artifacts and historic trash	AZ AA:3:288(ASM)
<b>36</b>	<b>Archaeological site</b>	<b>Native American artifacts and historic trash</b>	<b>AZ AA:3:317(ASM)</b>
<b>37</b>	<b>Archaeological site</b>	<b>Native American cooking feature and artifacts</b>	<b>AZ AA:7:439(ASM)</b>
38	Archaeological site	Native American cooking/heating feature	AZ AA:3:297(ASM)
39	Archaeological site	Native American cooking/heating features and artifacts	AZ AA:3:115(ASM)
40	Archaeological site	Native American hearth and artifacts	AZ AA:3:48(ASM)
41	Archaeological site	Native American petroglyphs and ceramic artifacts	AZ AA:8:4(ASM)
<b>42</b>	<b>Archaeological site</b>	<b>Native American pictographs and artifacts</b>	<b>AZ CC:9:15(ASM)</b>
43	Archaeological site	Native American rock feature and artifact scatter	AZ CC:10:97(ASM)
<b>44</b>	<b>Archaeological site</b>	<b>Native American rock features and artifact scatter</b>	<b>AZ BB:16:45(ASM)</b>
45	Archaeological site	Native American rock pile	AZ AA:7:441(ASM)
46	Archaeological site	Native American rock shelter and artifacts	AZ AA:8:325(ASM)
47	Archaeological site	Native American rock shelter and artifacts	AZ AA:8:328(ASM)
48	Archaeological site	Native American rock shelter and artifacts	AZ AA:8:329(ASM)
49	Archaeological site	Native American rock shelter and artifacts	AZ AA:8:331(ASM)
<b>50</b>	<b>Archaeological site</b>	<b>Native American stone feature(s) and artifacts</b>	<b>AZ AA:3:134(ASM)</b>
51	Archaeological site	Native American stone feature(s) and artifacts	AZ AA:3:135(ASM)
52	Archaeological site	Native American stone feature(s) and artifacts	AZ AA:3:291(ASM)
53	Archaeological site	Native American stone feature(s) and artifacts	AZ AA:3:301(ASM)
<b>54</b>	<b>Archaeological site</b>	<b>Native American stone feature(s) and artifacts</b>	<b>AZ AA:3:138(ASM)</b>
55	Archaeological site	Native American stone feature(s) and artifacts	AZ AA:3:141(ASM)

**Table E-2-1. Known Historic Sites, Structures, and Archaeological Sites**

<b>No.</b>	<b>Type</b>	<b>Description</b>	<b>Identifier</b>
56	Archaeological site	Native American stone feature(s) and artifacts	AZ AA:3:294(ASM)
57	Archaeological site	Native American stone feature(s) and artifacts	AZ AA:3:298(ASM)
58	Archaeological site	Native American stone feature(s) and artifacts	AZ AA:3:299(ASM)
59	Archaeological site	Native American stone feature(s) and artifacts	AZ AA:3:300(ASM)
60	Archaeological site	Native American stone feature(s) and artifacts	AZ AA:3:307(ASM)
61	Archaeological site	Native American stone feature(s) and artifacts	AZ AA:3:309(ASM)
62	Archaeological site	Native American stone feature(s) and artifacts	AZ AA:3:47(ASM)
<b>63</b>	<b>Archaeological site</b>	<b>Native American stone feature(s) and artifacts</b>	<b>AZ BB:15:87(ASM)</b>
64	Archaeological site	Native American stone feature(s) and artifacts	AZ BB:15:89(ASM)
<b>65</b>	<b>Archaeological site</b>	<b>Native American stone feature(s) and artifacts</b>	<b>AZ AA:7:440(ASM)</b>
<b>66</b>	<b>Archaeological site</b>	<b>Native American stone feature(s) and artifacts</b>	<b>AZ AA:8:326(ASM)</b>
<b>67</b>	<b>Archaeological site</b>	<b>Native American trash mounds</b>	<b>AZ AA:3:316(ASM)</b>
<b>68</b>	<b>Archaeological site</b>	<b>Native American village/habitation</b>	<b>AZ AA:3:136(ASM)</b>
69	Archaeological site	Native American village/habitation	AZ CC:11:52(ASM)
<b>70</b>	<b>Archaeological site</b>	<b>Native American village/habitation</b>	<b>AZ BB:15:86(ASM)</b>
<b>71</b>	<b>Archaeological site</b>	<b>Native American village/habitation</b>	<b>AZ BB:15:88(ASM)</b>
<b>72</b>	<b>Historic site</b>	<b>Historic artifact scatter</b>	<b>AZ AA:2:356(ASM)</b>
<b>73</b>	<b>Historic site</b>	<b>Historic artifact scatter</b>	<b>AZ AA:3:314(ASM)</b>
74	Historic site	Historic artifact scatter	AZ CC:11:65(ASM)
<b>75</b>	<b>Historic site</b>	<b>Historic dump</b>	<b>AZ AA:3:315(ASM)</b>
76	Historic site	Native American (Tohono O'odham) habitation	AZ AA:8:6(ASM)
<b>77</b>	<b>Historic site</b>	<b>Trail and historic trash</b>	<b>AZ AA:3:318(ASM)</b>
<b>78</b>	<b>Historic structure</b>	<b>Butterfield Stage Route</b>	<b>AZ T:14:61(ASM)</b>
<b>79</b>	<b>Historic structure</b>	<b>Canada del Oro/Camp Grant Wagon Road</b>	<b>AZ BB:9:41(ASM)</b>

**Table E-2-1. Known Historic Sites, Structures, and Archaeological Sites**

<b>No.</b>	<b>Type</b>	<b>Description</b>	<b>Identifier</b>
80	Historic structure	Casa Grande Canal	AZ AA:3:209(ASM)
81	Historic structure	Coolidge to Oracle 115 kV Transmission Line	AZ BB:5:134(ASM)
82	Historic structure	Florence Canal	AZ AA:3:211(ASM)
83	Historic structure	Florence-Casa Grande Canal	AZ AA:3:215(ASM)
84	Historic structure	Historic road	AZ AA:2:132(ASM)
85	Historic structure	Historic road	AZ AA:3:292(ASM)
86	Historic structure	Mammoth Mine to Oracle 12kV Transmission Line	AZ BB:6:223(ASM)
87	Historic structure	Oracle to Holbrook Highway	AZ BB:2:78(ASM)
88	Historic structure	Phoenix to Tucson Highway	AZ AA:8:360(ASM)
89	Historic structure	Saguaro to Oracle 115kV Transmission Line	AZ AA:8:366(ASM)
90	Historic structure	San Manuel Railroad	AZ BB:6:227(ASM)
91	Historic structure	Southern Pacific Mail and Stage Line	Not assigned
92	Historic structure	Southern Pacific Railroad, Wellton to Phoenix to Eloy spur	AZ T:10:84(ASM)
93	Historic structure	State Route 80	AZ FF:9:17(ASM)
94	Historic structure	State Route 87	AZ AA:6:63(ASM)
95	Historic structure	Sunshine Road	AZ AA:2:176(ASM)
96	Historic structure	Tiger Mine Road	AZ BB:6:243(ASM)
97	Historic structure	US Highway 191	AZ FF:1:33(ASM)
98	Not stated in records	Unknown	4(BLM)
99	Not stated in records	Unknown	89-3(NMSN)
100	Not stated in records	Unknown	89-4(NMSN)
101	Not stated in records	New site not completely entered into database.	AZ AA:2:305(ASM)
102	Not stated in records	New site not completely entered into database.	AZ AA:3:313(ASM)
103	Not stated in records	New site not completely entered into database.	AZ AA:3:321(ASM)

<b>Table E-2-1. Known Historic Sites, Structures, and Archaeological Sites</b>			
<b>No.</b>	<b>Type</b>	<b>Description</b>	<b>Identifier</b>
104	Not stated in records	New site not completely entered into database.	AZ AA:7:654(ASM)
105	Not stated in records	New site not completely entered into database.	AZ AA:7:655(ASM)
106	Not stated in records	New site not completely entered into database.	AZ AA:7:656(ASM)
<b>107</b>	<b>Not stated in records</b>	<b>New site not completely entered into database.</b>	<b>AZ BB:5:1(MNA)</b>
108	Not stated in records	New site not completely entered into database.	AZ CC:10:127(ASM)
109	Not stated in records	New site not completely entered into database.	AZ CC:9:55(ASM)
110	Not stated in records	New site not completely entered into database.	AZ CC:9:56(ASM)
111	Not stated in records	New site not completely entered into database.	AZ CC:9:57(ASM)
<b>112</b>	<b>Not stated in records</b>	<b>New site not completely entered into database.</b>	<b>AZ CC:9:58(ASM)</b>
113	Not stated in records	Unknown	IHCRS 83-9 214
Bold items are located in 400-foot-wide ROW.			

### **Potential Impacts to Historic Sites, Structures, and Archaeological Sites**

Forty-six sites are known to occur to occur within the 400-foot ROW. Three Native American sites, AZ AA:3:136(ASM), AZ AA:3:316(ASM), and AZ BB:15:88(ASM), could be located directly under the proposed transmission line. Sites AZ AA:3:136(ASM) and AZ BB:15:88(ASM) are large habitation sites or villages, while AZ AA:3:316(ASM) consists of four refuse mounds. The known sites within the 400-foot ROW are small enough that they can be avoided by careful placement of transmission line poles. However, since only 16 percent of the review area has been surveyed for cultural resources, it is likely that a complete inventory would identify many additional historic sites, structures, and archaeological sites.

The BLM has prepared a Programmatic Agreement (PA) for the project to address any potential impacts to cultural resources, including historic sites, structures, and archaeological sites. A copy of the PA is provided in Exhibit B-1. The PA was prepared with extensive consultation and input from state and federal agencies, Native American tribes, and other interested parties. In accordance with that PA, the proponent will pay for a complete inventory of the project footprint including a buffer zone, will perform an extensive records review to identify potential visual effects, and will be required to avoid and or mitigate any potential impacts to cultural resource sites. Also in accordance with the PA, consulting parties and signatories to the PA will be

provided the opportunity for ongoing input during implementation of cultural site avoidance and mitigation.

Through implementation of the stipulations in the PA prepared for the project, impacts to historic sites, structures, and archaeological sites would be avoided and/or mitigated.

**Exhibit F**

## **EXHIBIT F – RECREATIONAL PURPOSES AND ASPECTS**

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As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

*“State the extent, if any, the proposed site or route will be available to the public for recreational purposes, consistent with safety considerations and regulations and attach any plans the applicant may have concerning the development of the recreational aspects of the proposed site or route.”*

Exhibit F includes a county by county summary of recreation uses, as well as the potential impacts the Project may have on recreation. For further information on recreation, refer to the FEIS included as Exhibit B-1. For further information on visual resources, refer to Exhibit E.

The Applicant has no current plans to develop recreational facilities within the Project area. Existing designated and dispersed recreation opportunities will remain available for existing recreation uses and opportunities. Where the Project crosses existing roads or trails, permanent access to and along these features for recreation use would not be affected. The following is a list of recreation features within the Project study area, listed by county.

### **GREENLEE COUNTY**

Within the Project study corridor in Greenlee County, there are no designated recreation facilities, though Arizona State Land Department (ASLD) and Bureau of Land Management (BLM)-managed lands provide dispersed recreation opportunities such as rock-hounding, hiking, camping, and off-highway vehicle (OHV) driving.

### **GRAHAM COUNTY**

Within the portion of the Project study corridor in Graham County, dispersed recreation opportunities, including camping, hiking, picnicking, and OHV driving, can be found on ASLD, BLM, and United States Forest Service (USFS)-managed lands, and are described in more detail below.

The Hot Well Dunes Recreation Area is located on BLM lands within Graham County, approximately 15 miles north of Bowie, Arizona. The BLM Safford Field Office manages the Hot Well Dunes Recreation Area as a Special Recreation Management Area (SRMA) to provide recreation opportunities including natural hot tub facilities, OHV driving, camping, picnicking, and fishing (BLM 2015). No impacts to recreation opportunities at the Hot Well Dunes Recreation Area are expected from the Project, as it is not crossed by the Project.

The USFS Coronado National Forest (CNF) manages a portion of the corridor that travels southeast of the Pinaleno Mountains, wherein dispersed recreation opportunities such as camping, hiking, horseback riding, picnicking, and fishing are available. No impacts to recreation opportunities within the CNF-Pinaleno Mountains are expected from the Project, as the CNF is not crossed by the Project.

## **COCHISE COUNTY**

Dispersed recreation opportunities exist on privately held and ASLD, BLM, and USFS-managed land within the portion of the Project study corridor in Cochise County. Publicly available recreation opportunities found on private lands include several private orchards and farms in the regions northwest of Willcox, Arizona, available for produce picking; and The Nature Conservancy's Three Links Farm, which is located approximately 13 miles north of Benson, Arizona, and is encumbered with a conservation easement that restricts use of the riparian corridor to passive recreation, such as wildlife viewing and hiking.

In addition, the CNF manages two portions of the Project study corridor located in Cochise County, one southeast of the Winchester Mountains, and a second east of the Rincon Mountains, both providing dispersed recreation opportunities, such as camping, hiking, backpacking, and equestrian activities. There are also dispersed recreation opportunities along the San Pedro River, including hiking, bicycling, equestrian, fishing, birding, and other wildlife watching activities. No impacts to these dispersed recreation opportunities within Cochise County are expected from the Project.

## **PIMA COUNTY**

Within the portion of the Project study corridor in Pima County, dispersed recreation opportunities exist on privately held, ASLD, and USFS-managed land, including camping, hiking, biking, picnicking, and OHV driving. Dispersed recreation opportunities exist along the San Pedro River, including hiking, bicycling, equestrian, fishing, birding, and other wildlife watching activities. No impacts to these dispersed recreation opportunities are expected from the Project. A portion of the CNF-managed Rincon Mountain Wilderness is within the Project study corridor in Pima County, east of the Rincon Mountains. The Rincon Mountain Wilderness provides dispersed primitive recreation opportunities, including hiking, backpacking, camping, and other non-motorized recreation. The proposed transmission lines would not cross the Rincon Mountain Wilderness, and no impacts to recreation opportunities within the Rincon Mountain Wilderness are expected from the Project.

Conservation parcels owned and managed by Pima County and The Nature Conservancy are located within the Project study corridor, and provide dispersed recreation opportunities, including hiking trails and four-wheel drive roads. No impacts to these dispersed recreation opportunities are expected from the Project.

A portion of the Redington Scenic Road passes through private and ASLD land within the Pima County portion of the Project study corridor, and would be crossed by the Project. The Redington Scenic Road is a Pima County-designated scenic route that travels between the Santa Catalina and Rincon Mountains, and provides scenic vistas characteristic of southern Arizona landscapes. While the Project would cross Redington Scenic Road, the transmission line would span the roadway and no direct impacts to dispersed recreation opportunities accessible along Redington Scenic Road, such as hiking, biking, and wildlife viewing, are expected from the Project.

## PINAL COUNTY

Within Pinal County, dispersed recreation opportunities can be found on ASLD, BLM, and USFS-managed lands, including camping, hiking, biking, picnicking, and OHV driving. The CNF manages a portion of land traversed by the Project study corridor in Pinal County, north of the Catalina Mountains, as well as a portion of the Arizona National Scenic Trail (AZT) where dispersed recreation opportunities, such as hiking, biking, backpacking, and wildlife viewing, can be found.

Designated recreation facilities within the Project study corridor include several Pinal County-designated existing multi-use (e.g., biking, hiking, walking, and off-highway vehicle) corridors near the Pinal Central Substation, the majority of which run adjacent to existing washes; the Pinal County Fairgrounds and Event Center, which is located adjacent to the Pinal Central Substation, and hosts carnival, music, livestock, and food-based entertainment and recreation opportunities; the Tierra Grande Golf Course, located less than one mile southwest of the Pinal Central Substation; and the CAP canal, located approximately seven miles east of the Pinal Central Substation, which includes a recreation corridor on the east side of the canal, within the Project study area. No impacts to recreation opportunities within these designated facilities are expected from the Project.

The AZT, a congressionally designated National Scenic Trail, travels through a portion of the Project study corridor within Pinal County. The AZT provides recreation opportunities including hiking, backpacking, equestrian activities, mountain biking, trail running, and sightseeing. While the Project will cross a segment of the AZT, the transmission line will span the trail segment and no direct impacts to recreation opportunities on the AZT are expected from the Project.

A portion of Oracle State Park, managed by the Arizona State Parks, is located within the Pinal County portion of the Project study area. Oracle State Park provides recreation opportunities including historic exhibits, hiking, biking, picnicking, equestrian activities, and wildlife viewing. Within Oracle State Park are numerous hiking, biking, and equestrian trails, including a portion of the AZT. No impacts to recreation opportunities within Oracle State Park are expected from the Project.

Portions of the Pinal Pioneer Parkway (SR79) including a designated roadside table, and the Mount Lemmon Highway National Scenic Byway, are crossed by the Project study corridor. These designated scenic roadways provide scenic recreation opportunities to travelers. The Pinal Pioneer Parkway would be crossed by the Project, but the transmission line will span the roadways and no direct impacts to scenic roadways are expected from the Project. While the Mount Lemmon Highway is within the Project study area, the Project would not cross this scenic roadway.

The Picacho Reservoir is within the Project study corridor, located approximately 4.5 miles east of the Pinal Central Substation, and offers fishing and bird viewing opportunities. While the water level in the reservoir is seasonal, there is a primitive boat ramp, and camping is permitted around the reservoir. The Project would not affect the current recreation that takes place in and around the Picacho Reservoir.

Additional designated recreation opportunities within the Pinal County portion of the Project study corridor include various parks and schools within the communities of San Manuel and Oracle, Arizona, the closest of which is approximately two miles from the proposed route. A golf course associated with the Saddlebrook Ranch community development, located north of the intersection of SR77 and SR79, is within the Project study corridor. No impacts to recreation opportunities provided by these community facilities are expected from the Project.

According to the Pinal County Open Space and Trails Master Plan, there are two proposed/regional parks within the Pinal County portion of the Project study area. At this time, these parks are in the conceptual stage and no development has taken place. The first regional park is proposed north of Picacho Peak State Park and includes the Picacho Mountains. This proposed park within Pinal County would provide passive oriented recreation opportunities, including wildlife viewing and hiking. The second planned regional park is located west of Highway 79 and east of the proposed regional park near Picacho Peak State Park. This proposed park would also provide passive recreational opportunities to support the future development that may occur in the area. No impacts to the recreation facilities or use of these proposed parks are expected from the Project, because the Proposed Route, in these areas, is colocated with existing infrastructure.

**Exhibit G**

## EXHIBIT G CONCEPTS OF PROPOSED FACILITIES

As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

*“Attach any artist’s or architect’s conception of the proposed plan or transmission line structures and switchyards, which applicant believes may be informative to the committee.”*

### EXHIBIT G-1 TRANSMISSION STRUCTURE CONCEPTS

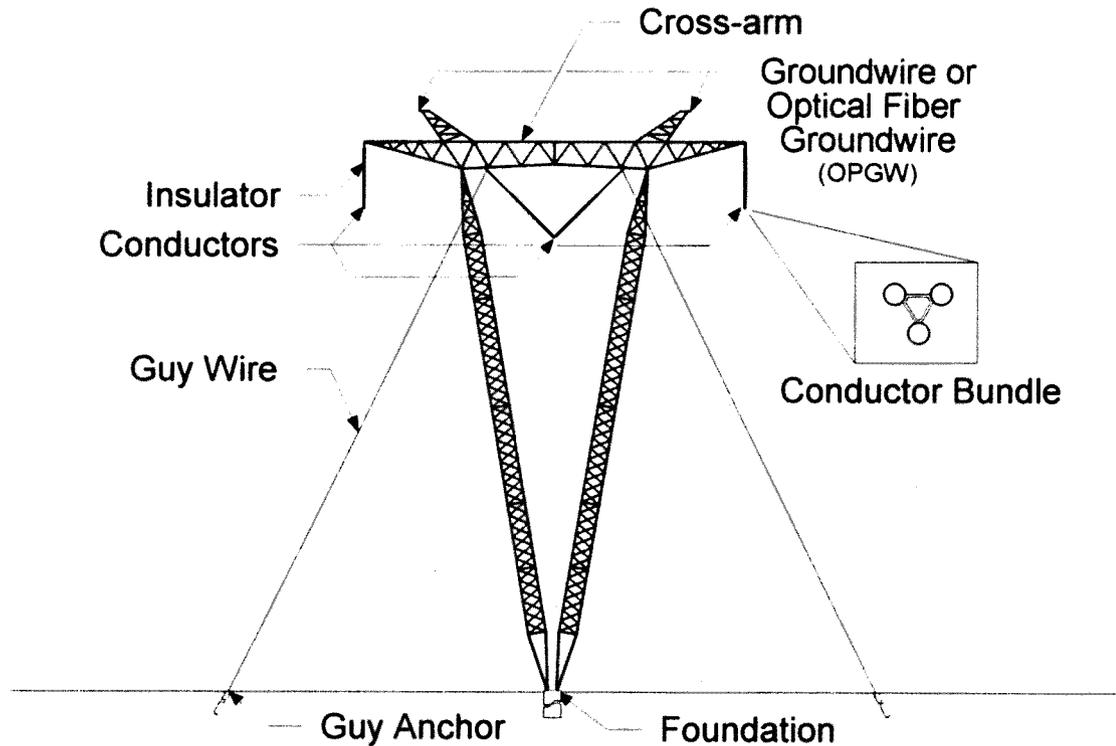
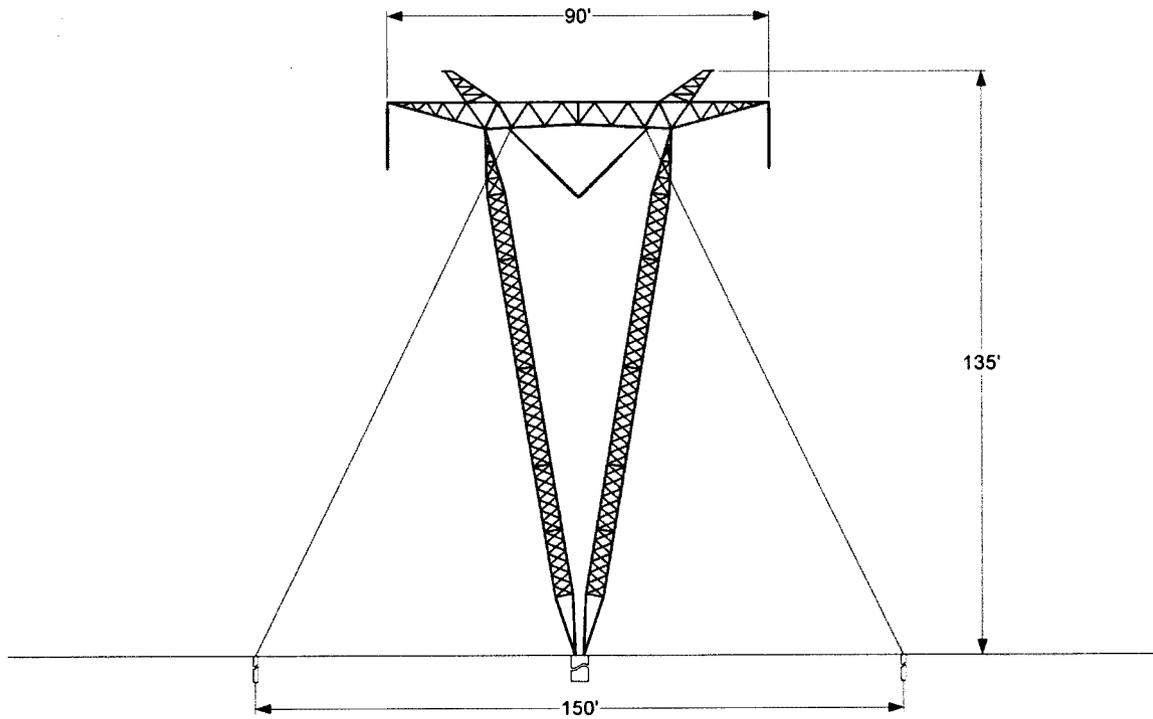
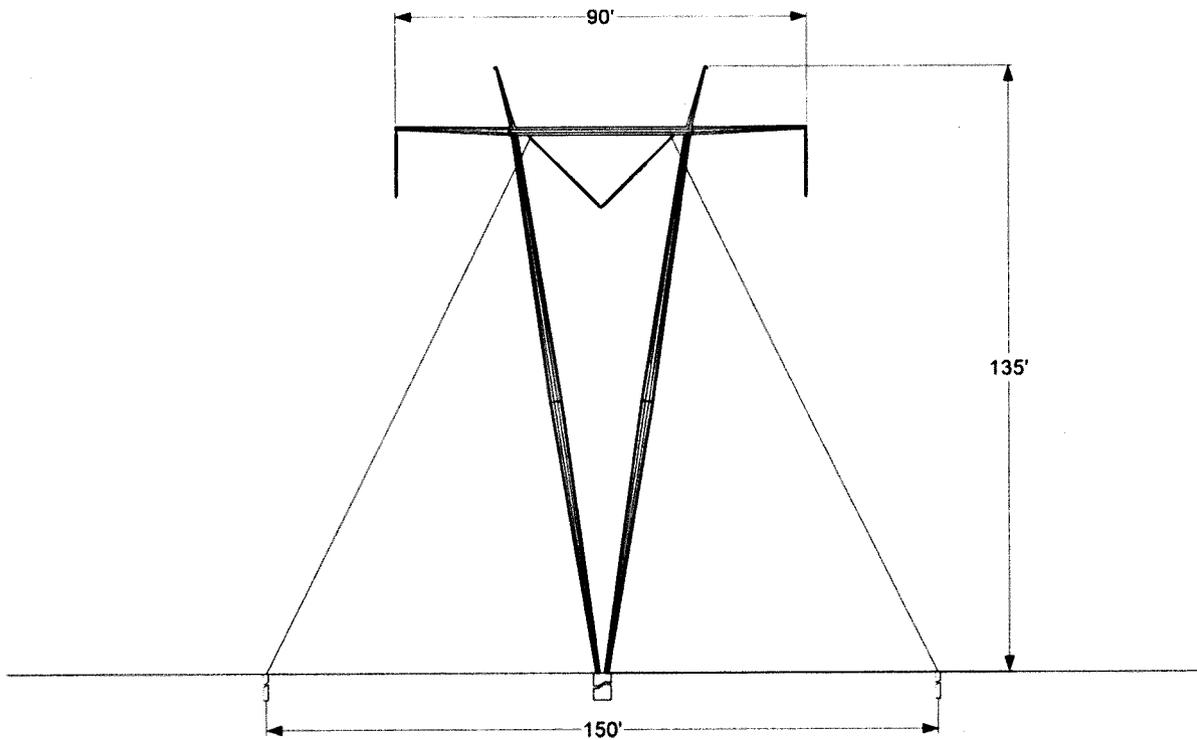


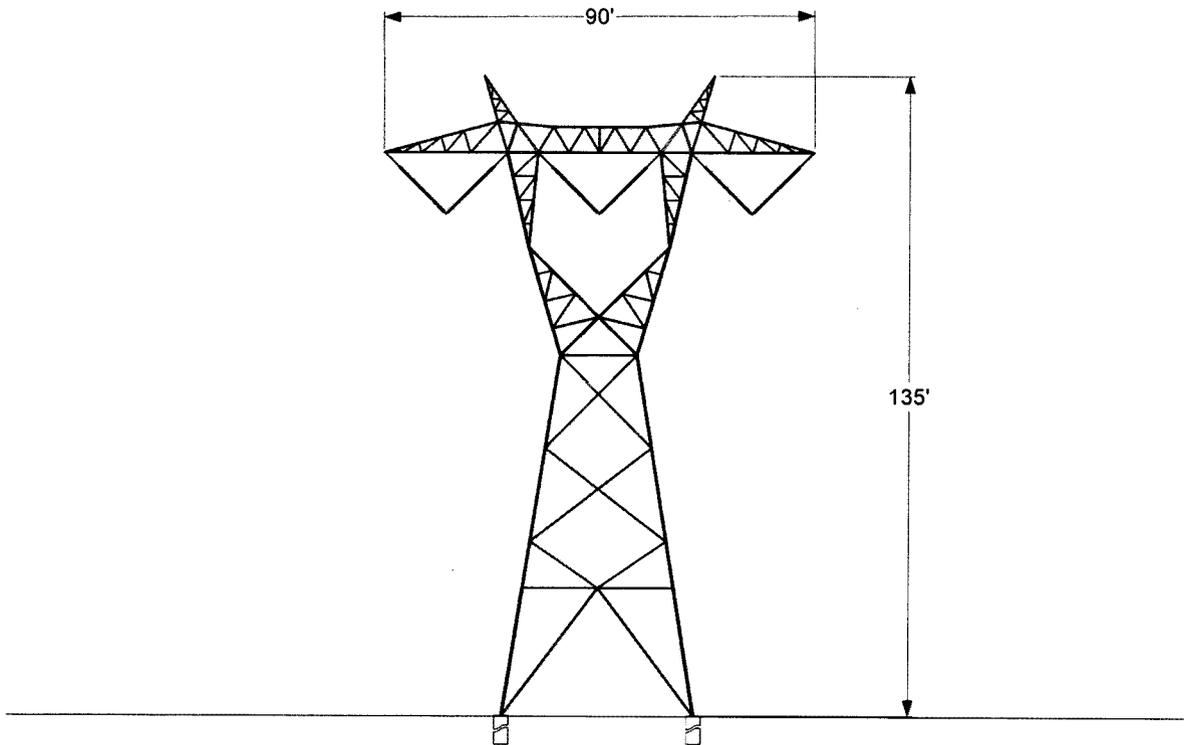
Figure G-1-1. Typical 500 kV Structure Diagram



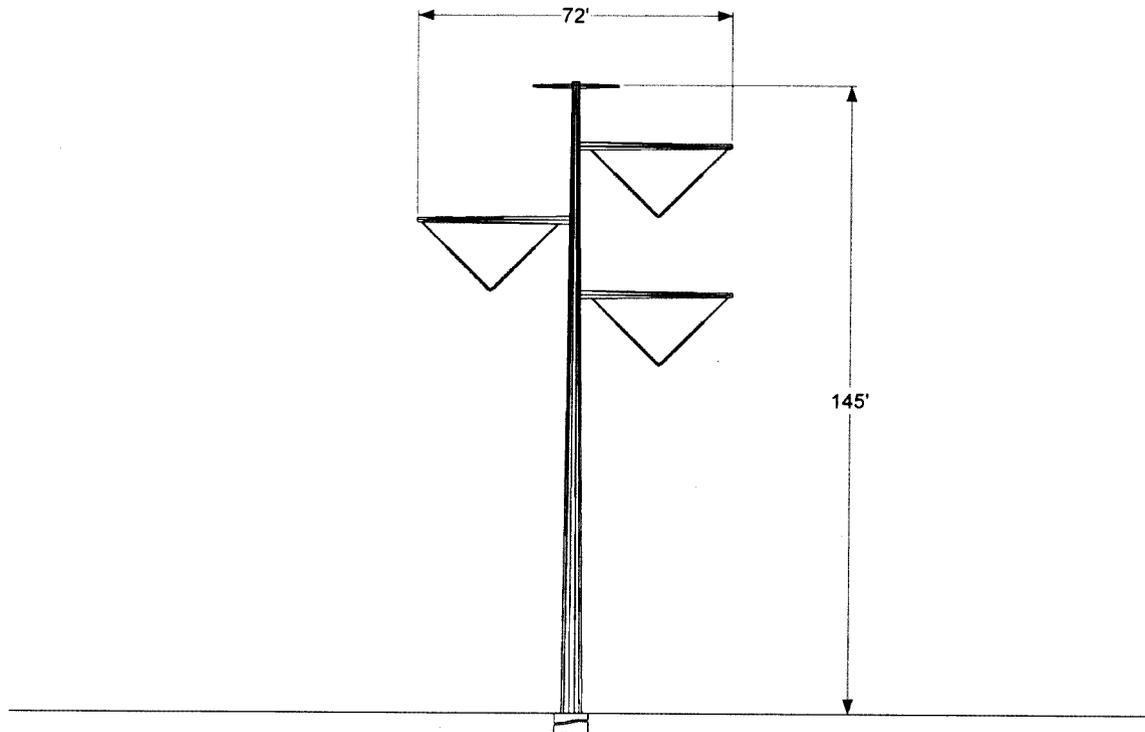
**Figure G-1-2. Typical 500 kV Guyed "V" Lattice Tangent Structure**



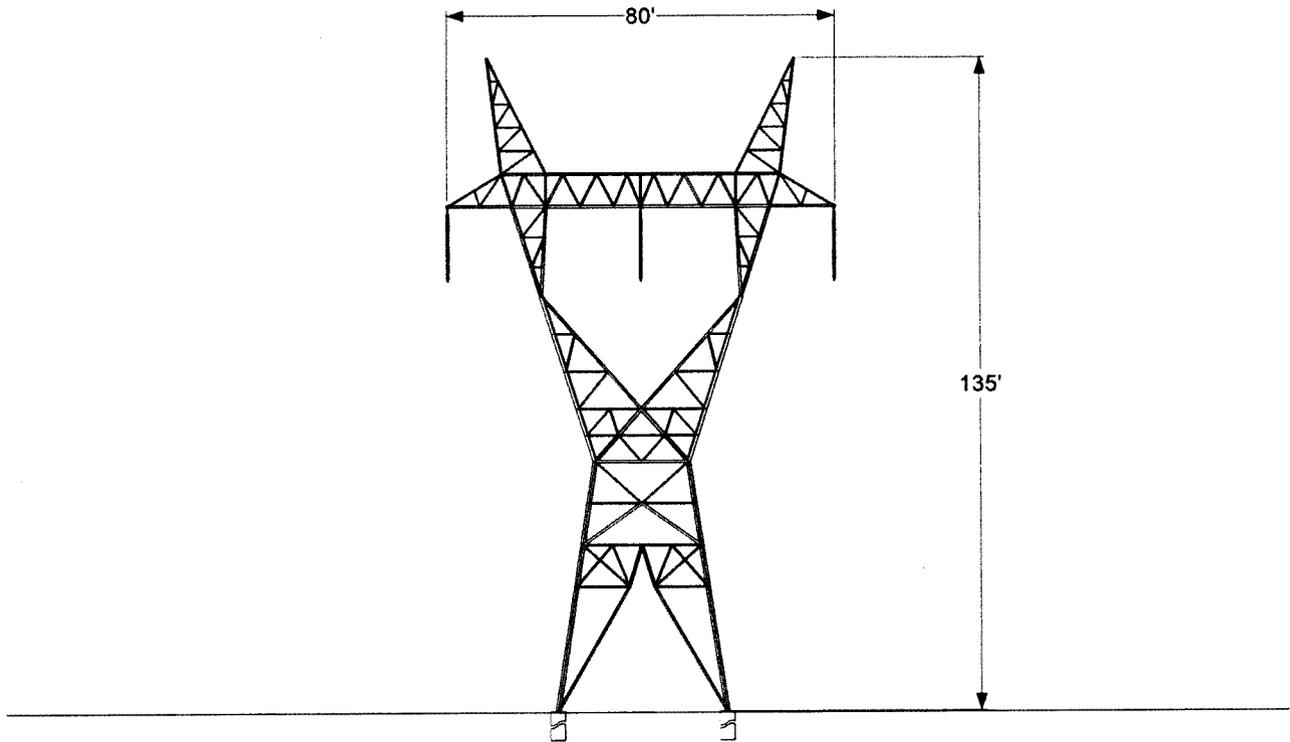
**Figure G-1-3. Typical AC Guyed "V" Tubular Tangent Structure**



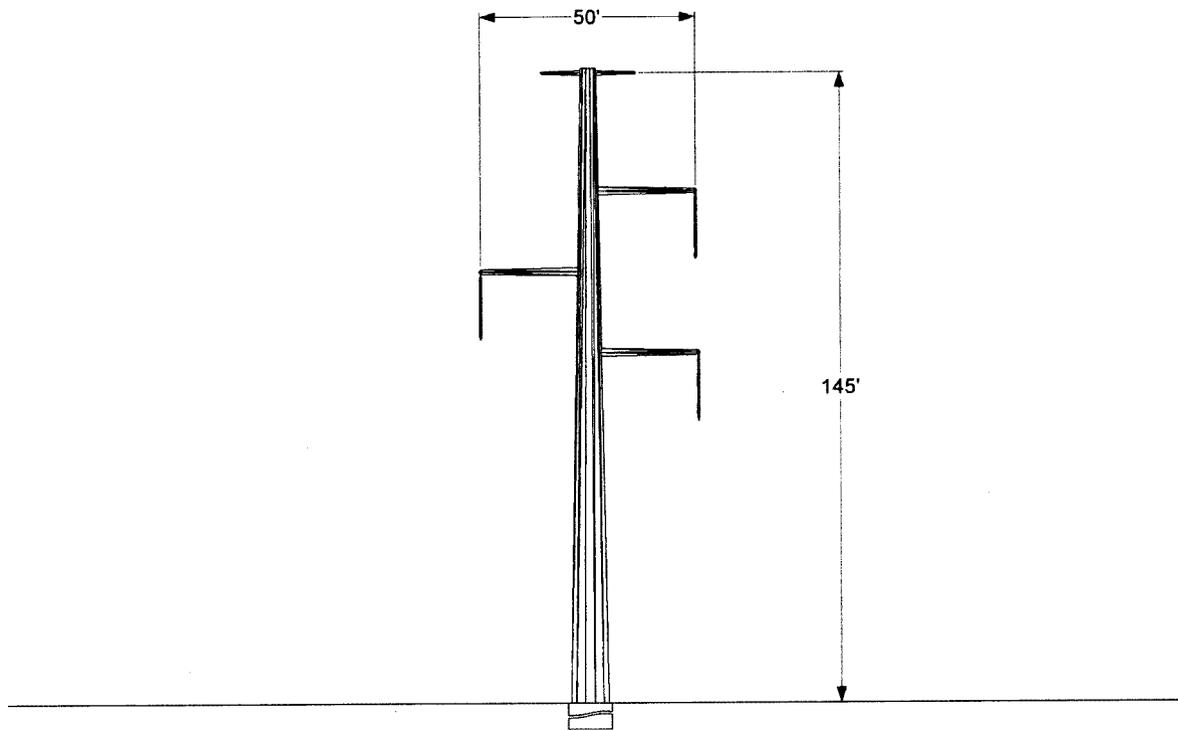
**Figure G-1-4. Typical AC Self-Supporting Lattice Tangent Structure**



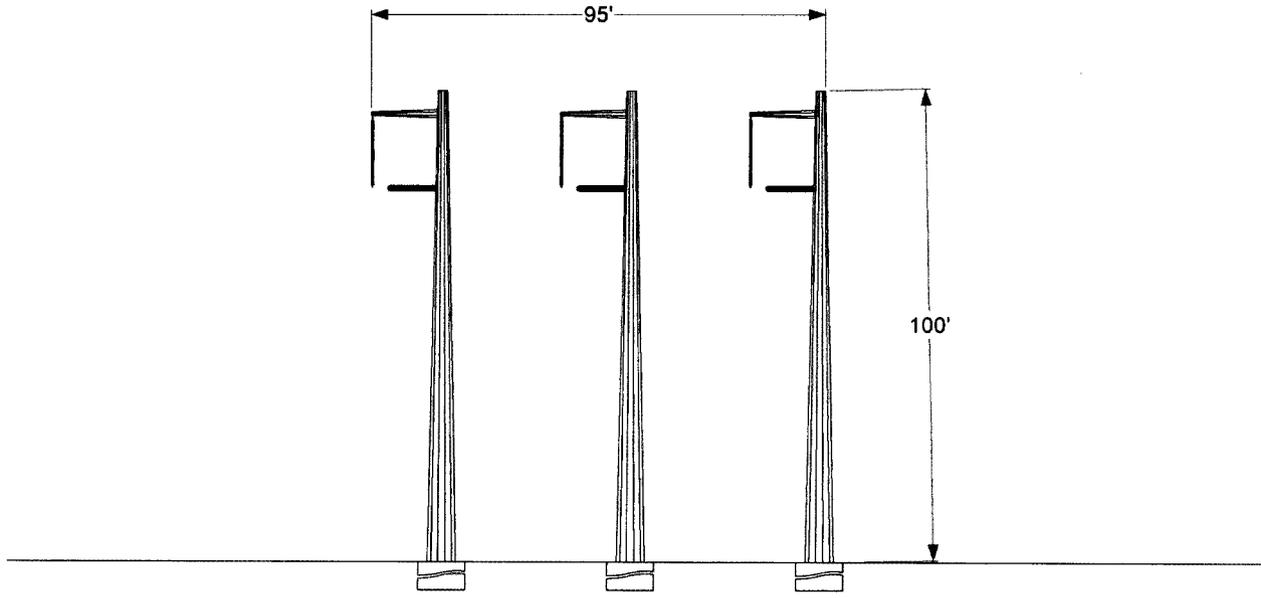
**Figure G-1-5. Typical AC Self-Supporting Tubular Tangent Structure**



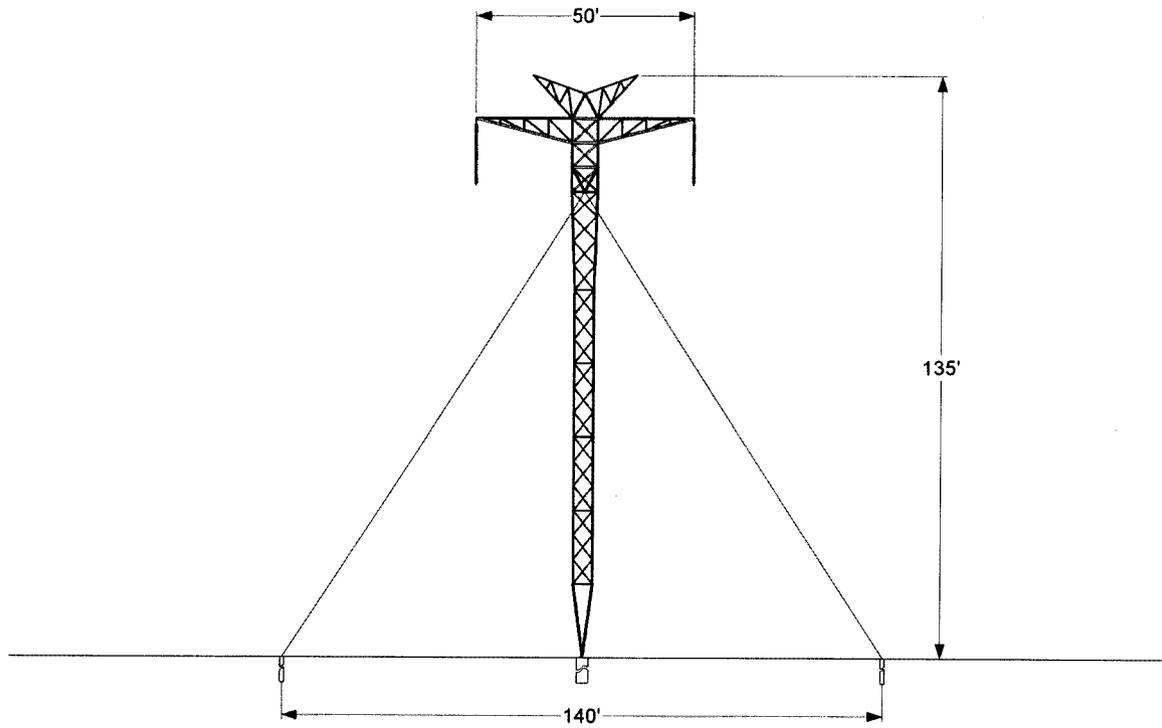
**Figure G-1-6. Typical AC Self-Supporting Dead-End Lattice Structure**



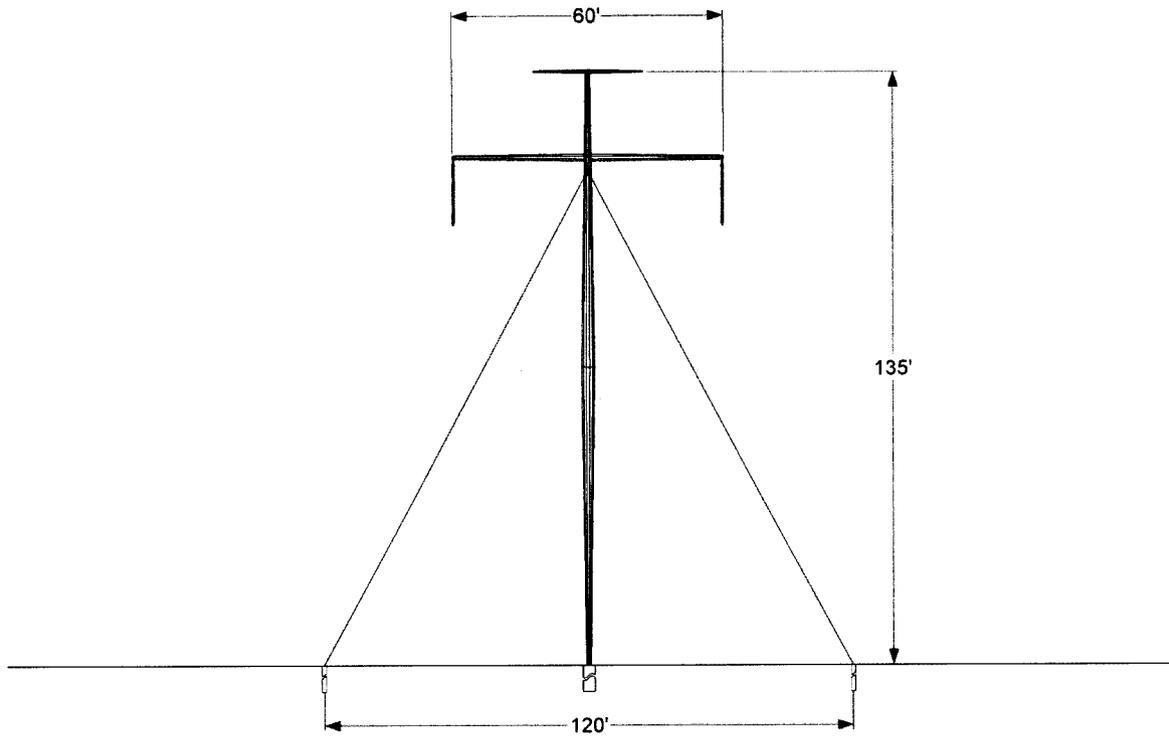
**Figure G-1-7. Typical AC Self-Supporting Dead-End Tubular Structure**



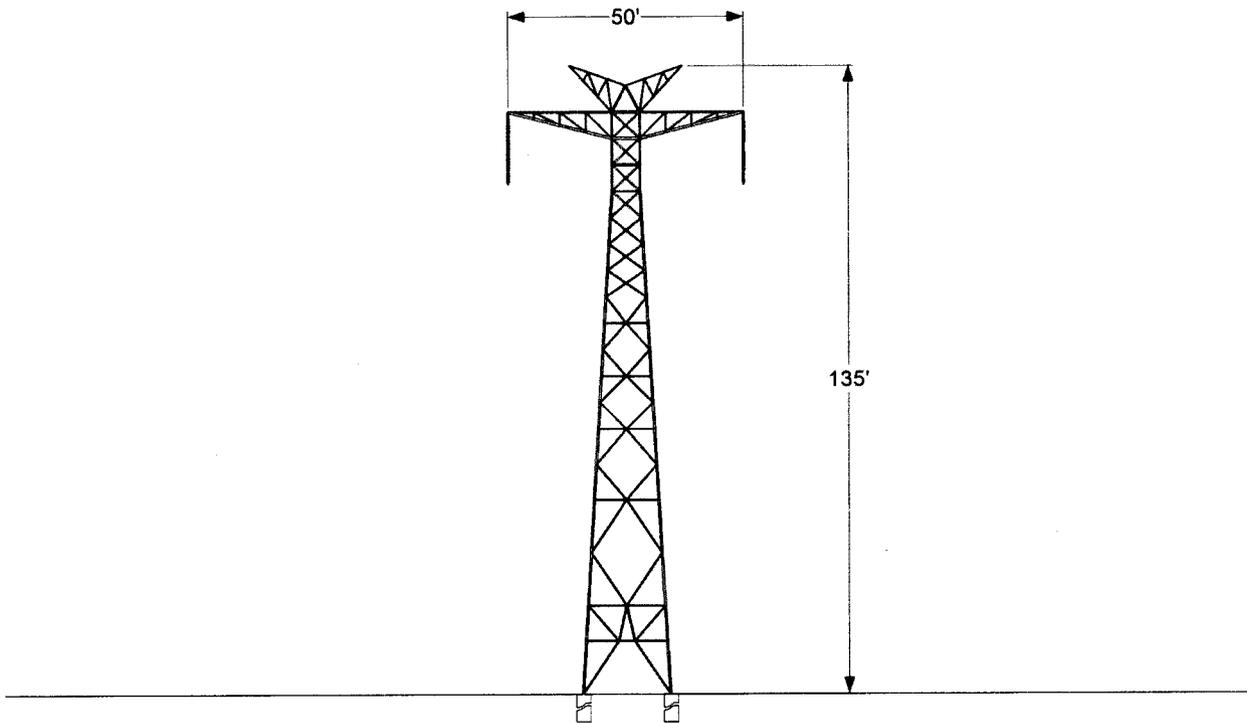
**Figure G-1-8. Typical AC Self-Supporting Dead-End Tubular, 3-Pole Structure**



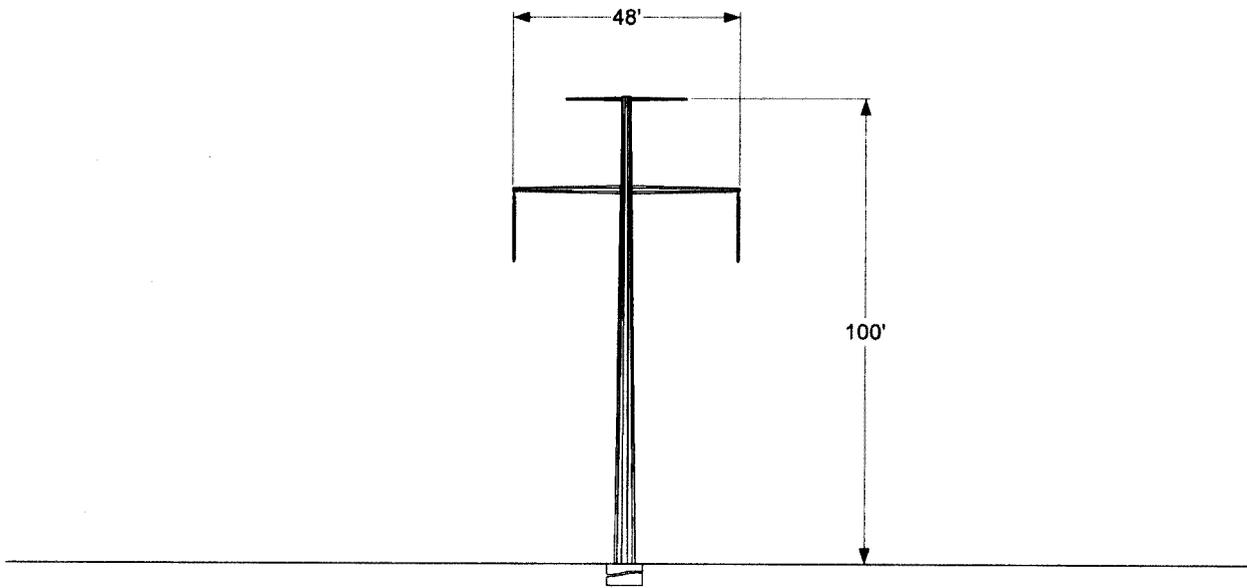
**Figure G-1-9. Typical DC Guyed Lattice Tangent Structure**



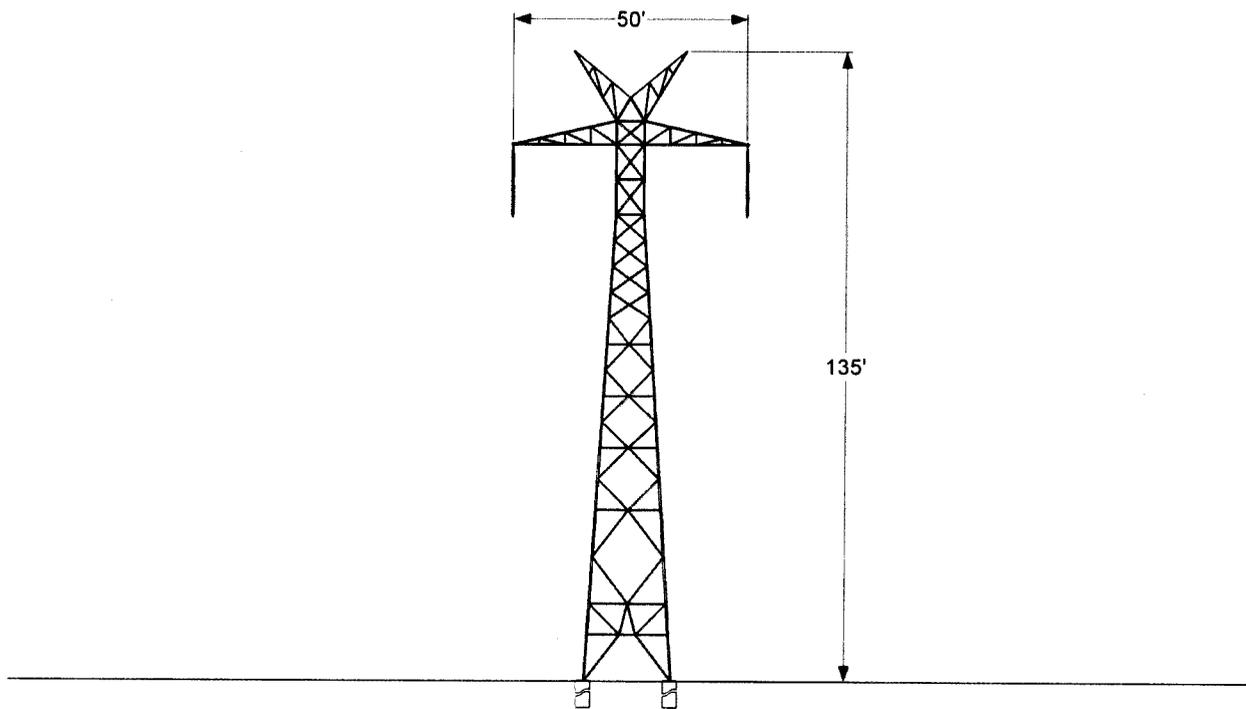
**Figure G-1-10. Typical DC Guyed Tubular Tangent Structure**



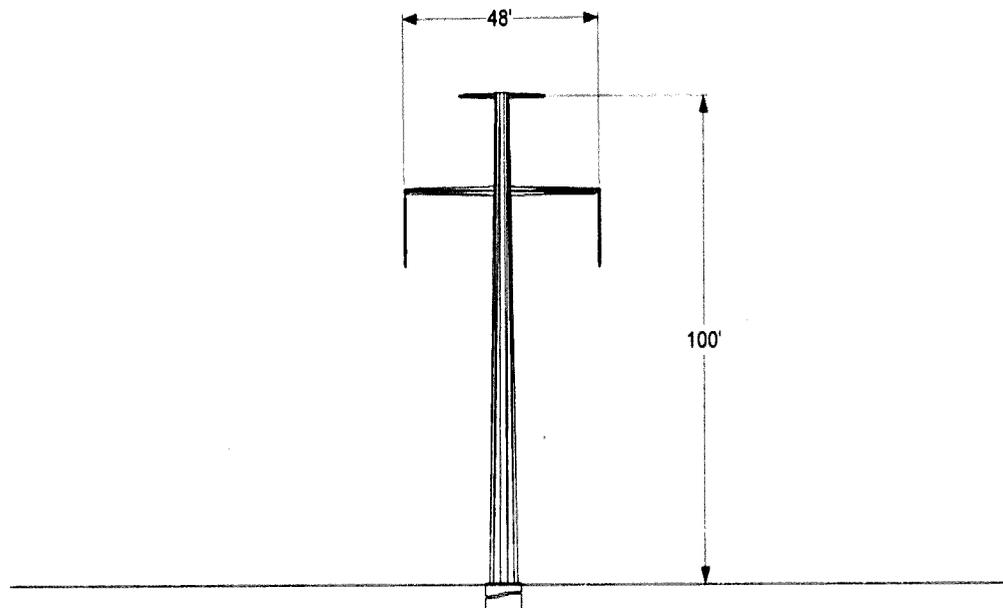
**Figure G-1-11. Typical DC Self-Supporting Lattice Tangent Structure**



**Figure G-1-12. Typical DC Self-Supporting Tubular Tangent Structure**

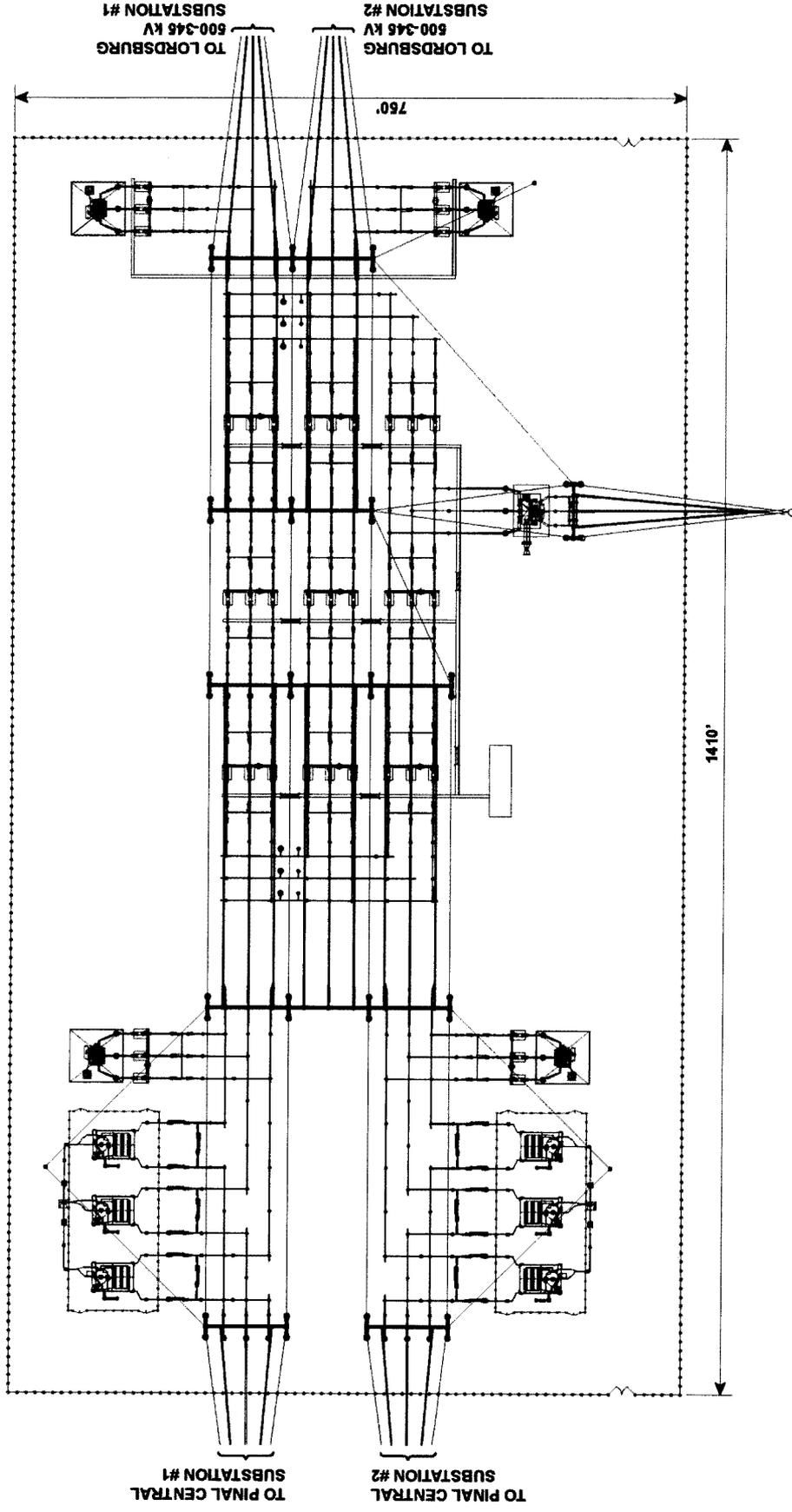


**Figure G-1-13. Typical DC Self-Supporting Dead-End Lattice Structure**



**Figure G-1-14. Typical DC Self-Supporting Dead-End Tubular Structure**

**EXHIBIT G-2 PROPOSED SUBSTATION LAYOUT: WILLOW-500 KV**



**Figure G-2-1. Proposed Substation Layout: Willow-500kV**

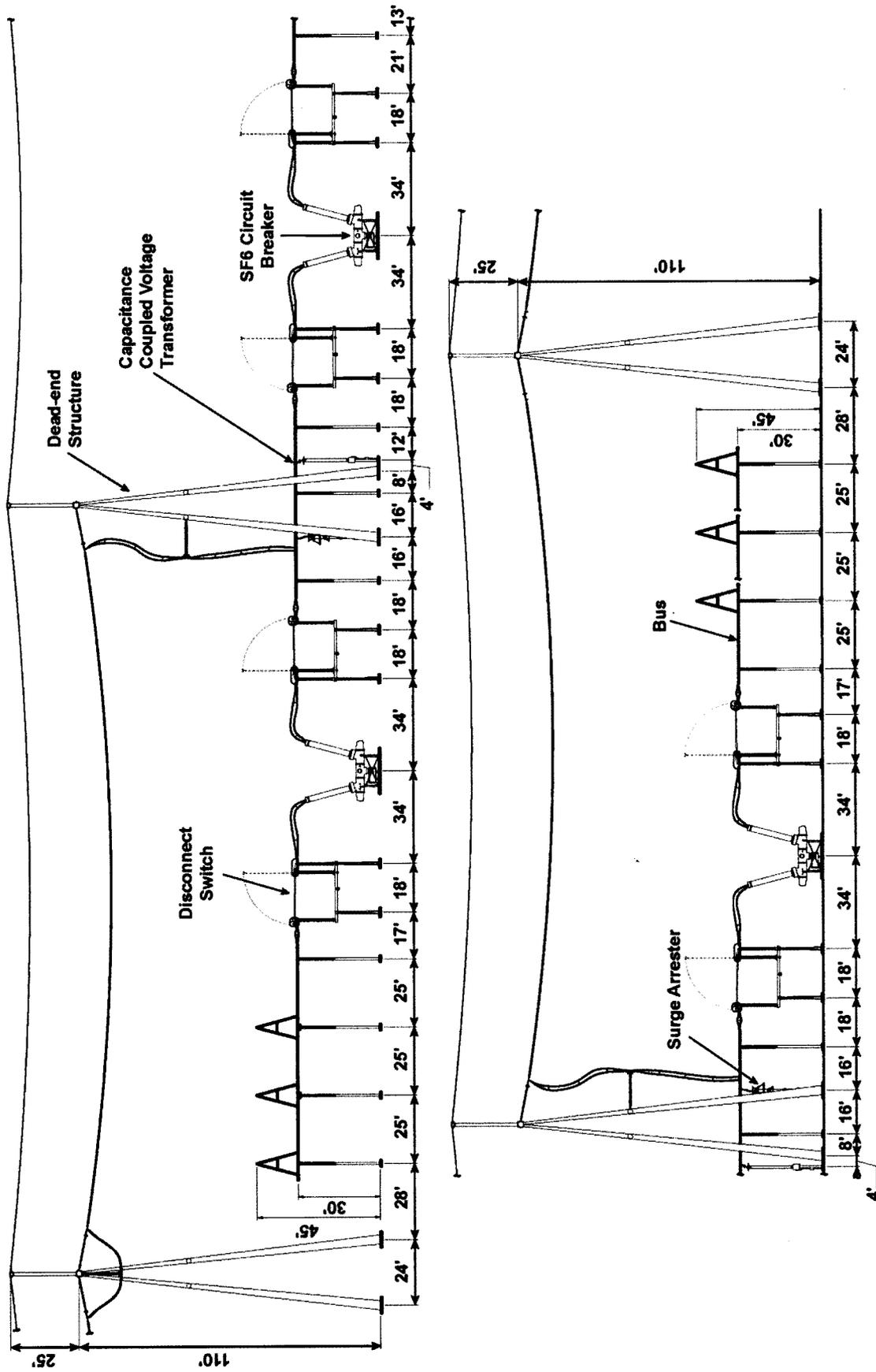


Figure G-2-2. Typical 500 kV Substation Schematic – Elevation View

EXHIBIT G-3

TYPICAL 500 kV DC CONVERTER STATION

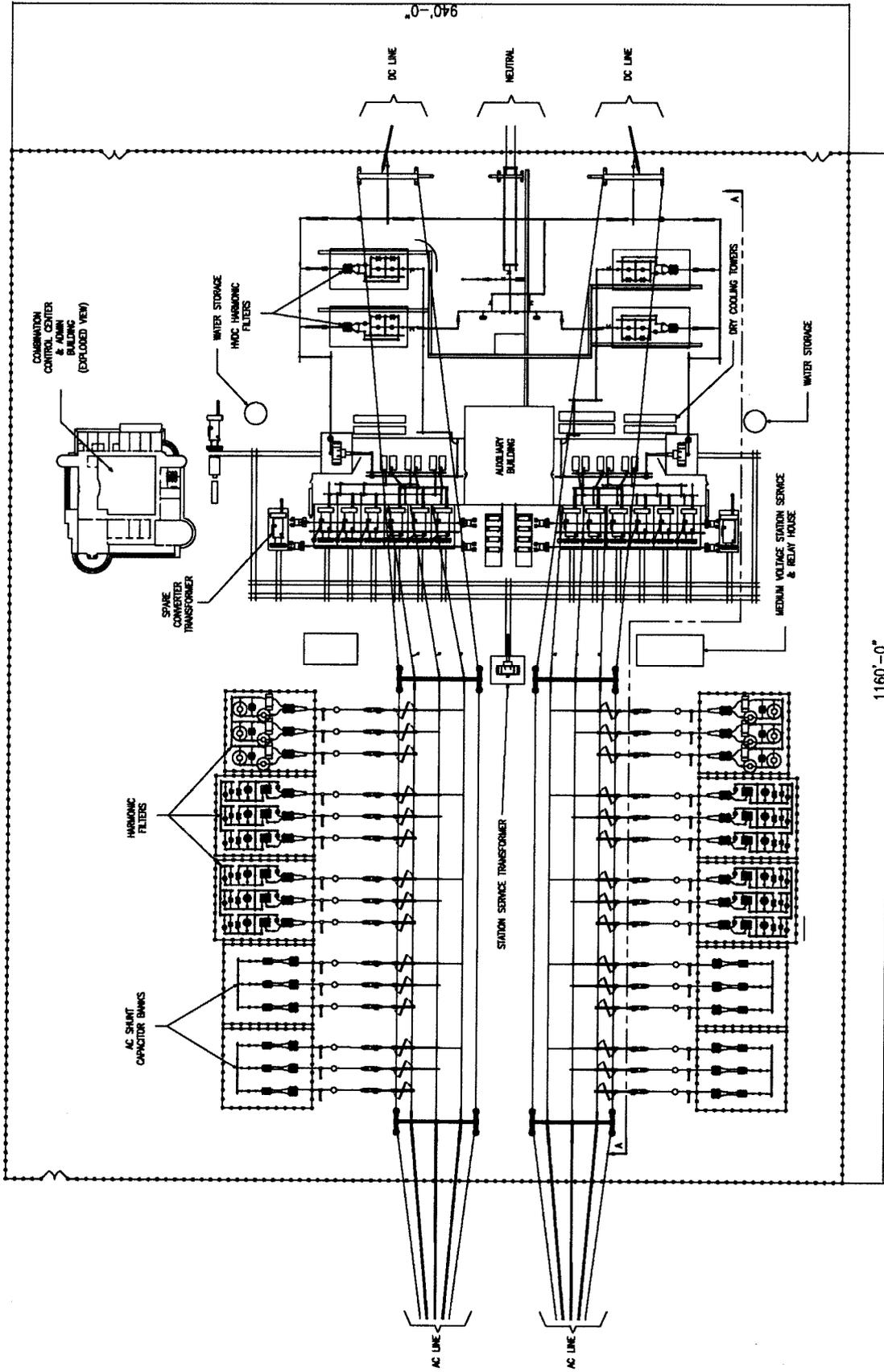
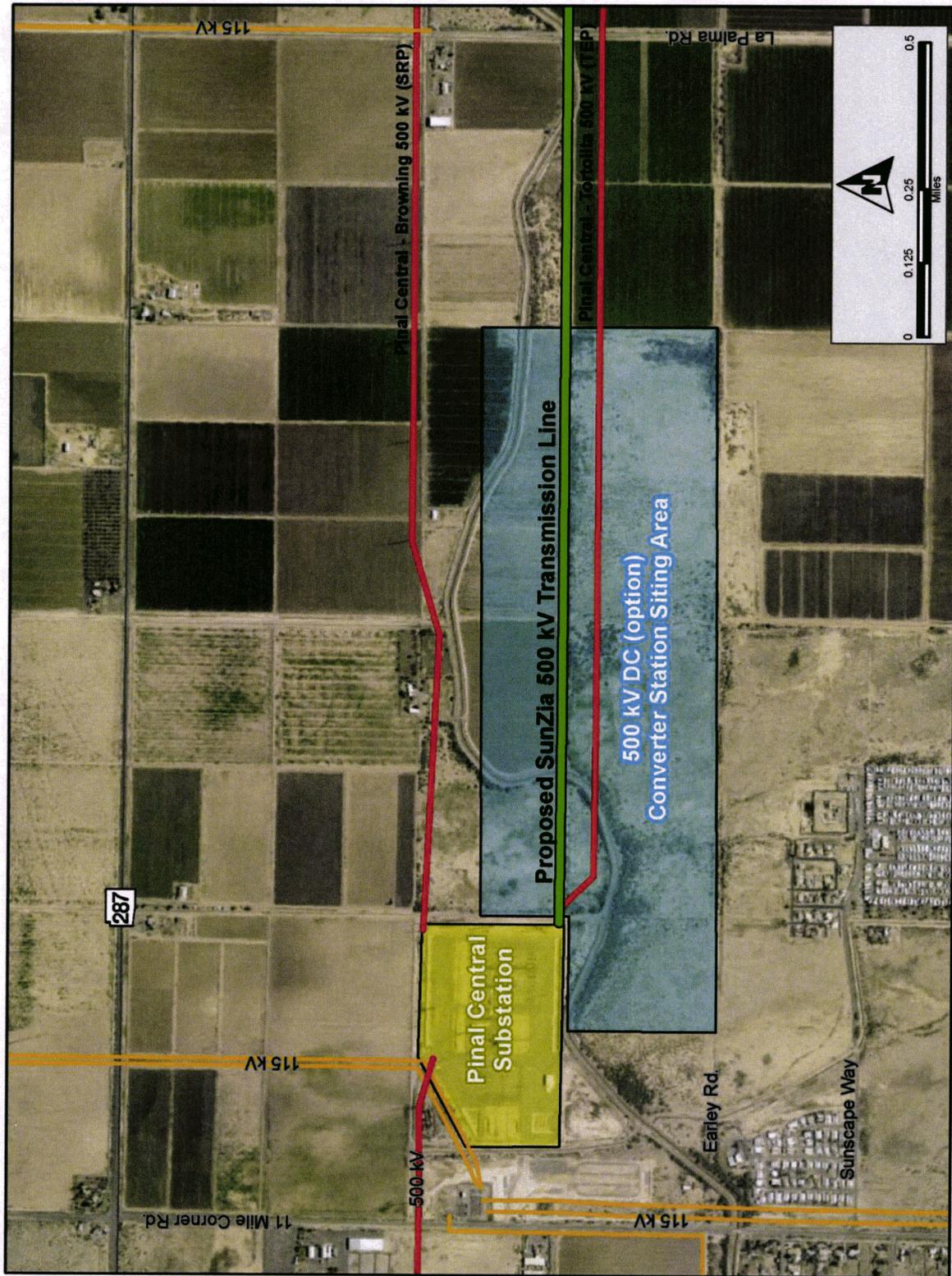


Figure G-3-1. Typical 500 kV DC Converter Station - Plan



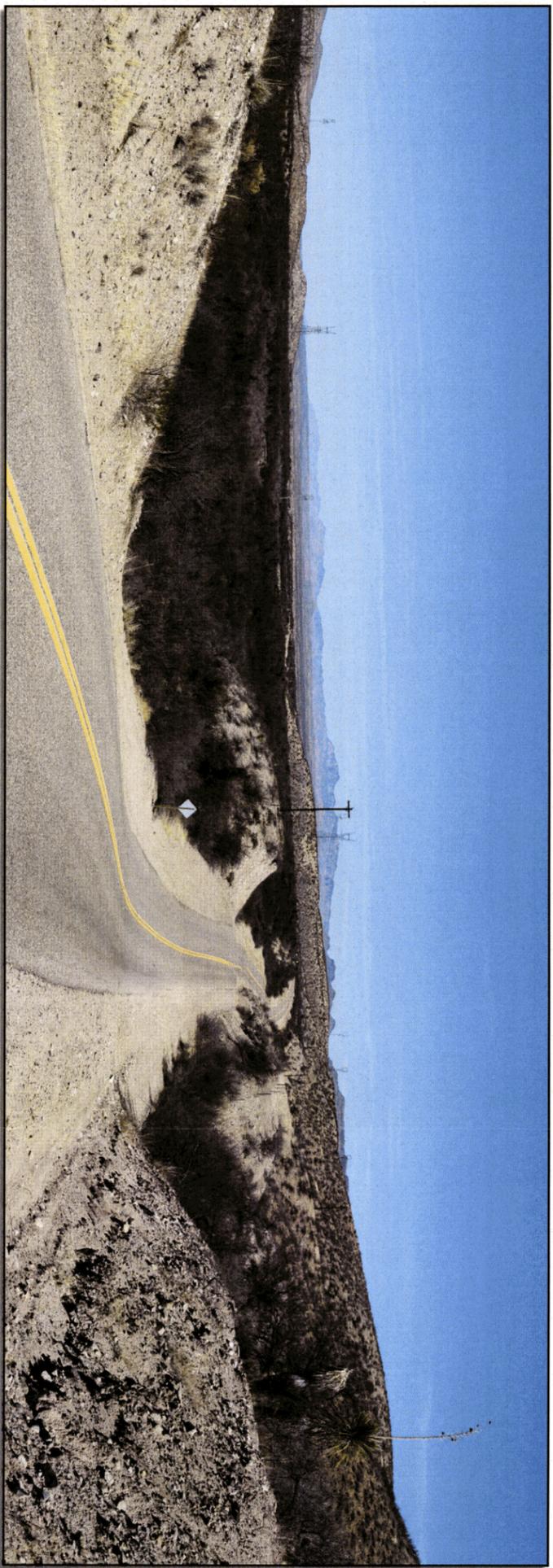


**Figure G-3-3. 500 kV DC (option) Converter Station Siting Area**

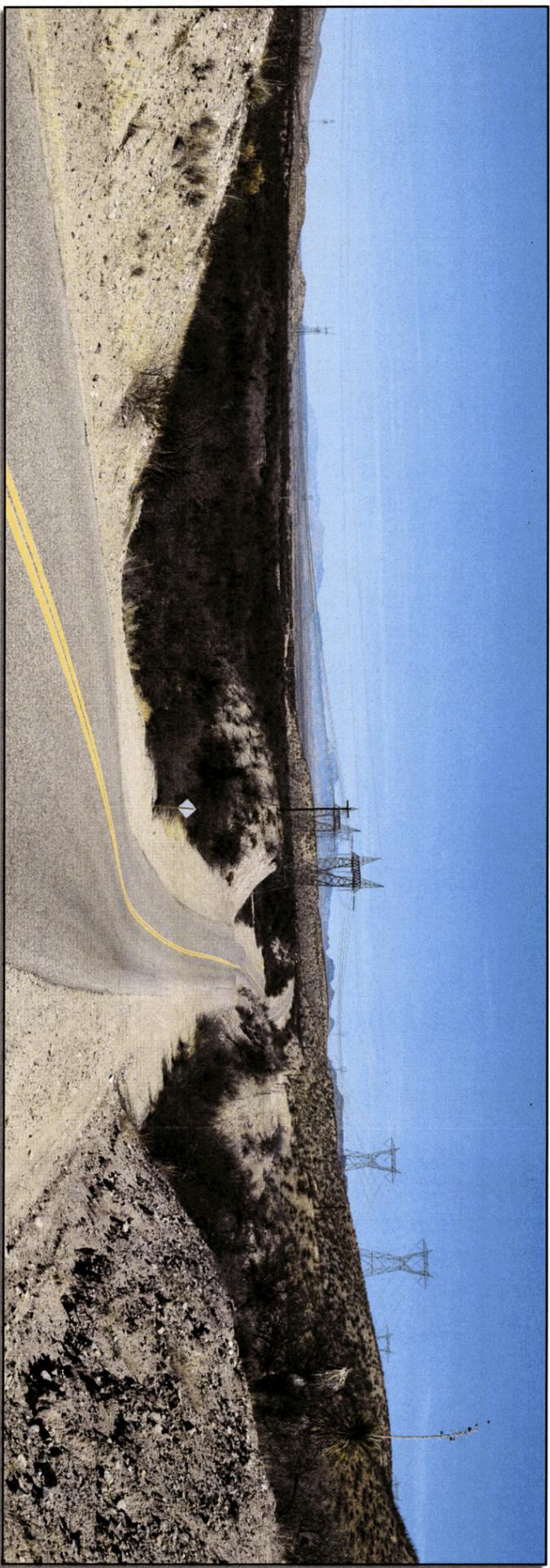
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**EXHIBIT G-4      SIMULATIONS**

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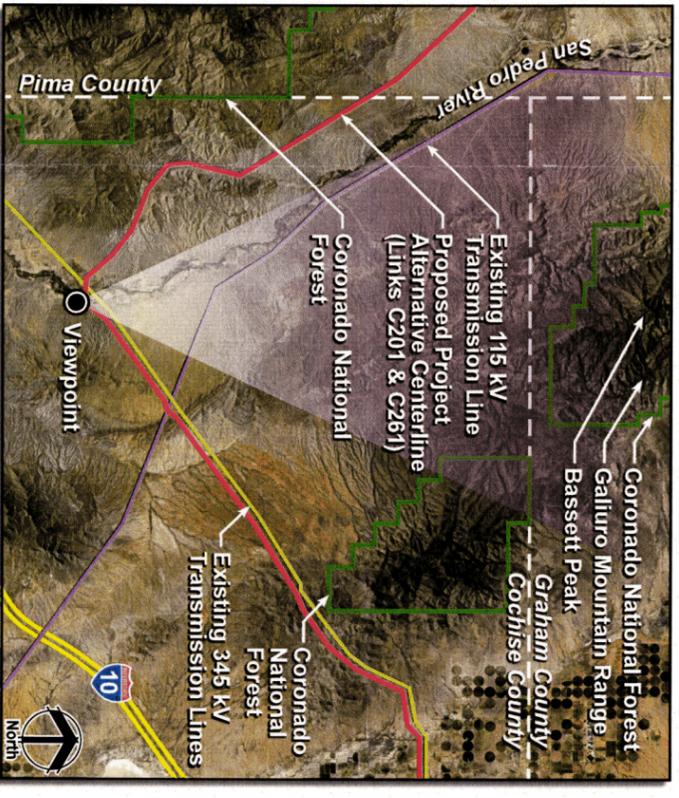


**Existing Condition** – View looking north along Cascabel Road toward existing 345 kV transmission line corridor approximately 1 mile north of viewpoint. Adjacent scenery includes Class A landscape of the San Pedro River.

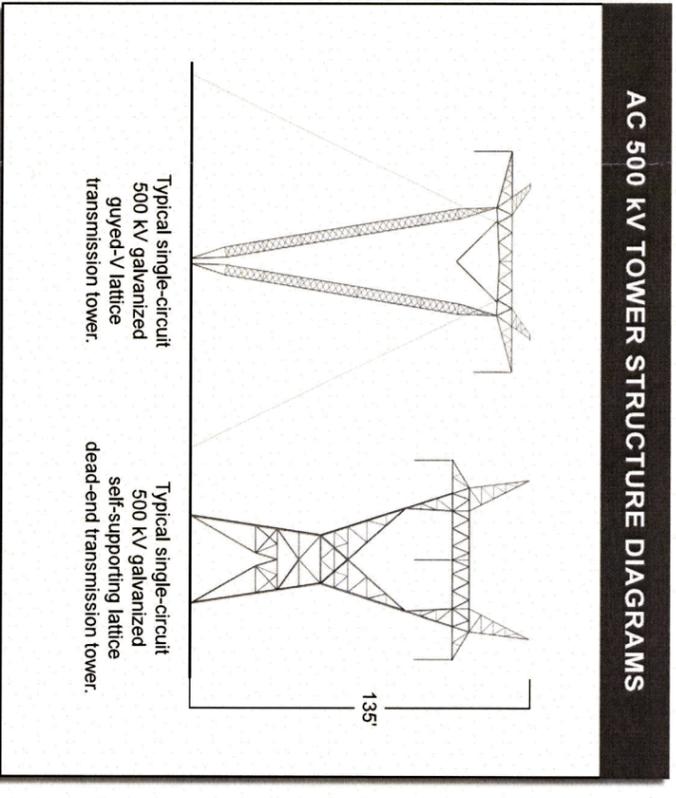


**Simulation** – The Project (see structure diagram) spanning Cascabel Road and the San Pedro River.

Photo Date and Time: 3-2-11, 11:46 a.m. Focal Length: 50mm  
 (The original photographs were taken at 50mm, then stitched together to create this panorama, resulting in an approximately 57-degree field of view)  
 Simulations were prepared using three-dimensional structure models provided by the owner's engineer.  
 Facility locations, colors, and heights will differ based on final engineering and design.



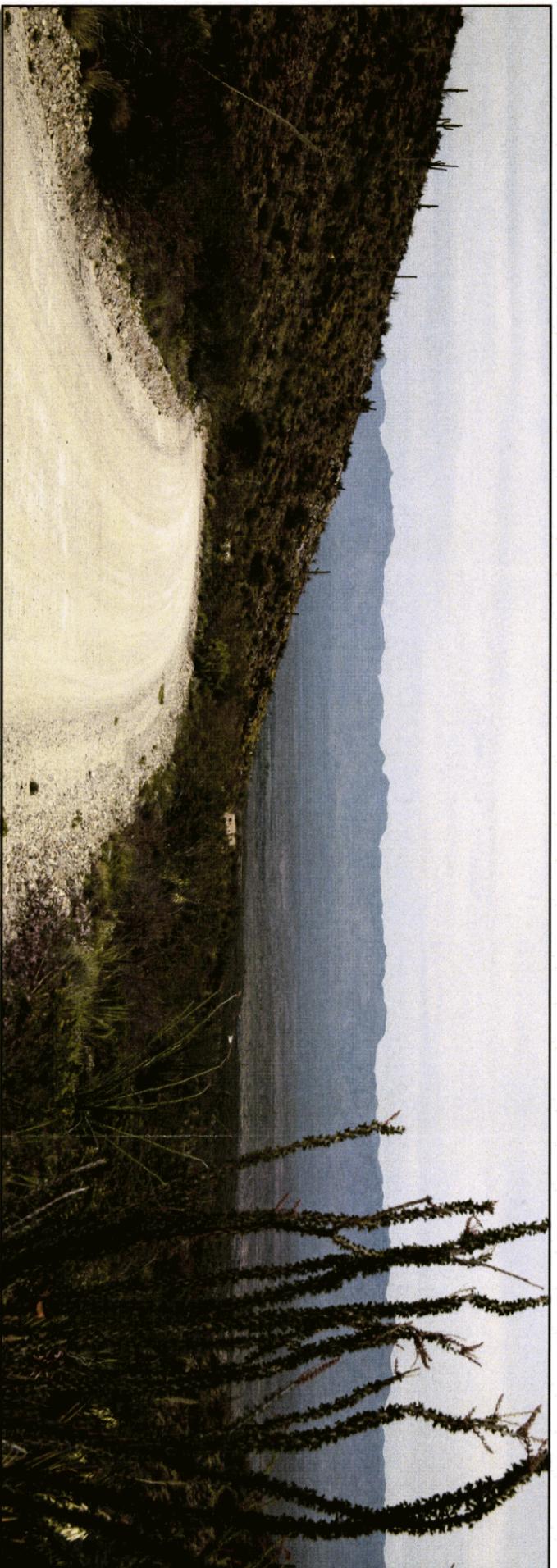
**Photograph Location:** Viewpoint is located 0.3 miles South of the proposed Route.



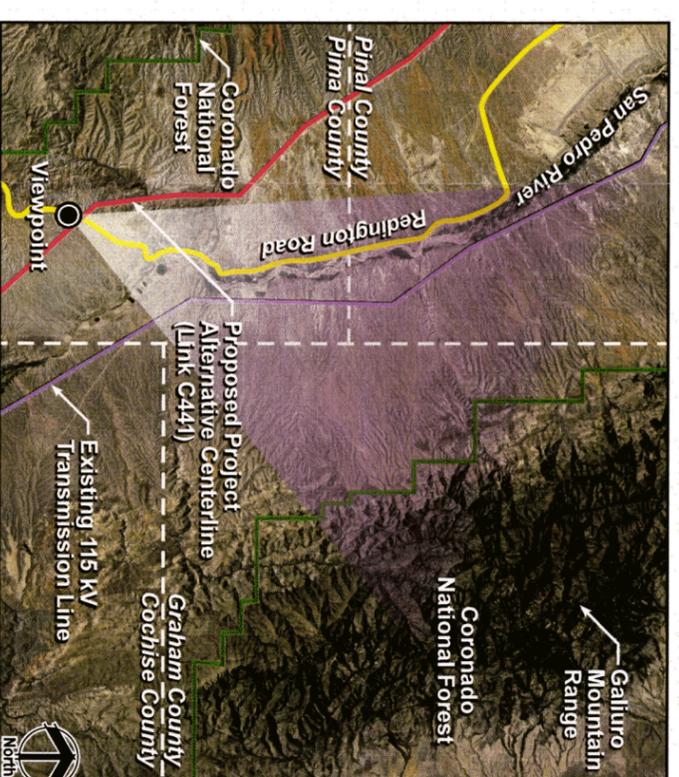
**SunZia Southwest Transmission Line Project**

**Exhibit G-4-1**

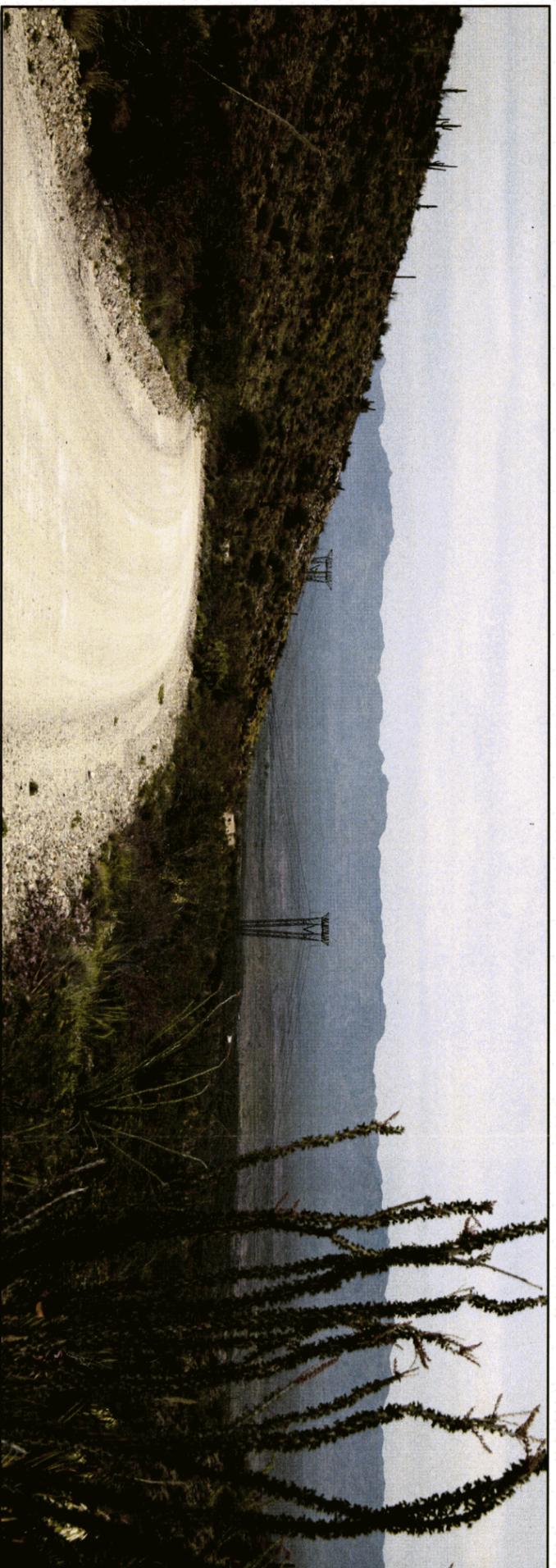
September 2015



**Existing Condition** – View looking north-northeast from Pima County-designated Scenic Redington Road. Views from the travel route overlook the San Pedro Valley.



**Photograph Location:** Viewpoint is located 0.4 miles South of the proposed Route.



**Simulation** – The Project (see structure diagram) with typical spans. The Project would be backdropped and partially screened by topography and vegetation.

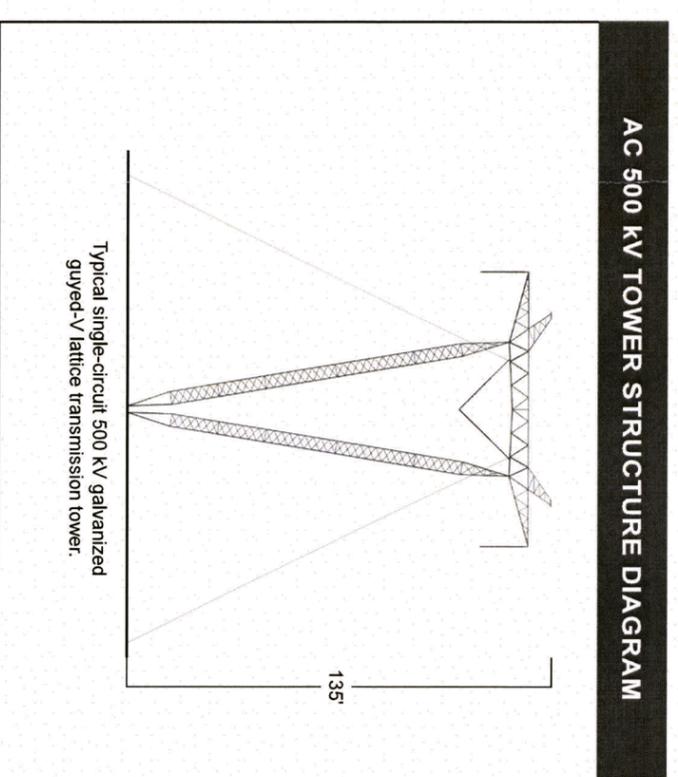
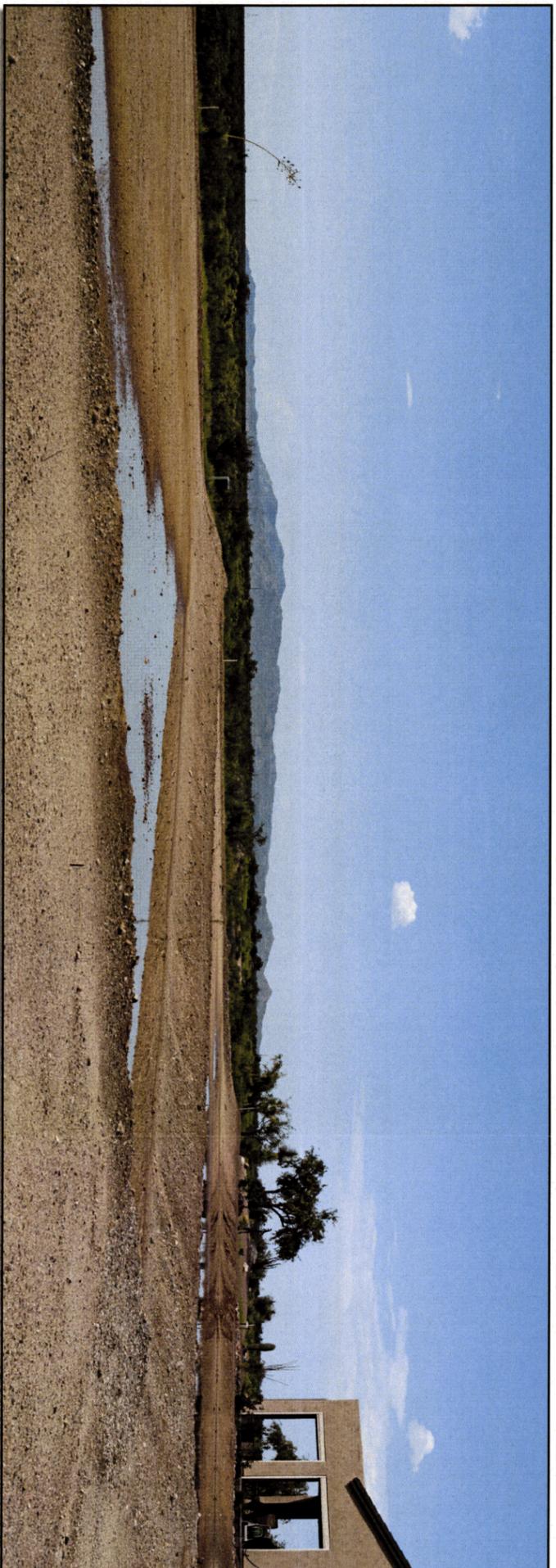
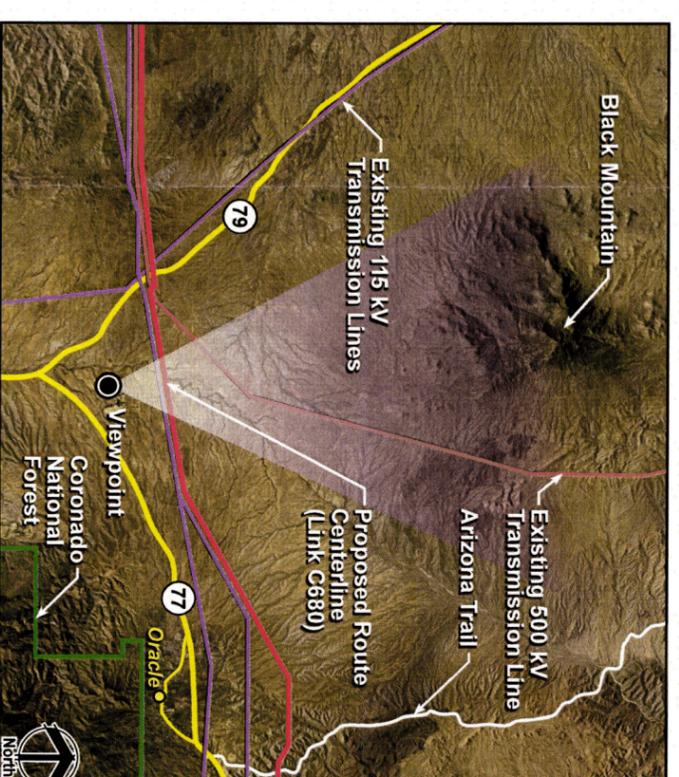


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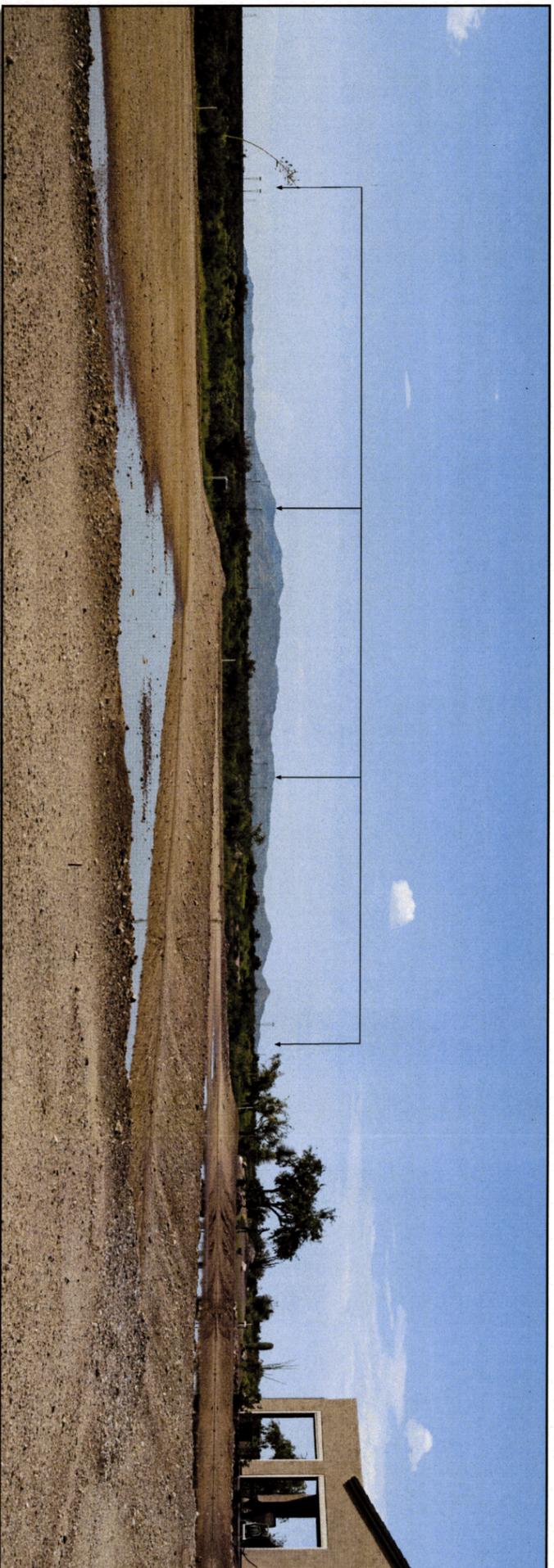
Simulations were prepared using three-dimensional structure models provided by the owner's engineer. Facility locations, colors, and heights will differ based on final engineering and design.



**Existing Condition** – View looking north toward the existing 500 kV and 115 kV transmission lines.



**Photograph Location:** Viewpoint is located 1.6 miles South of the proposed Route.



**Simulation** – The Project (see structure diagram) north of Saddlebrooke Ranch. The Project would have some sections skynlined and others backdropped by the Black Mountains.

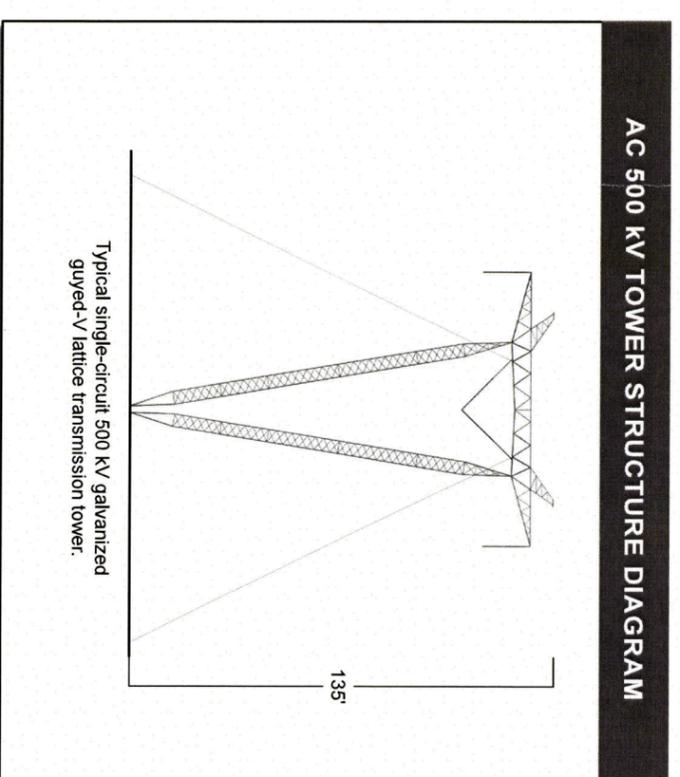
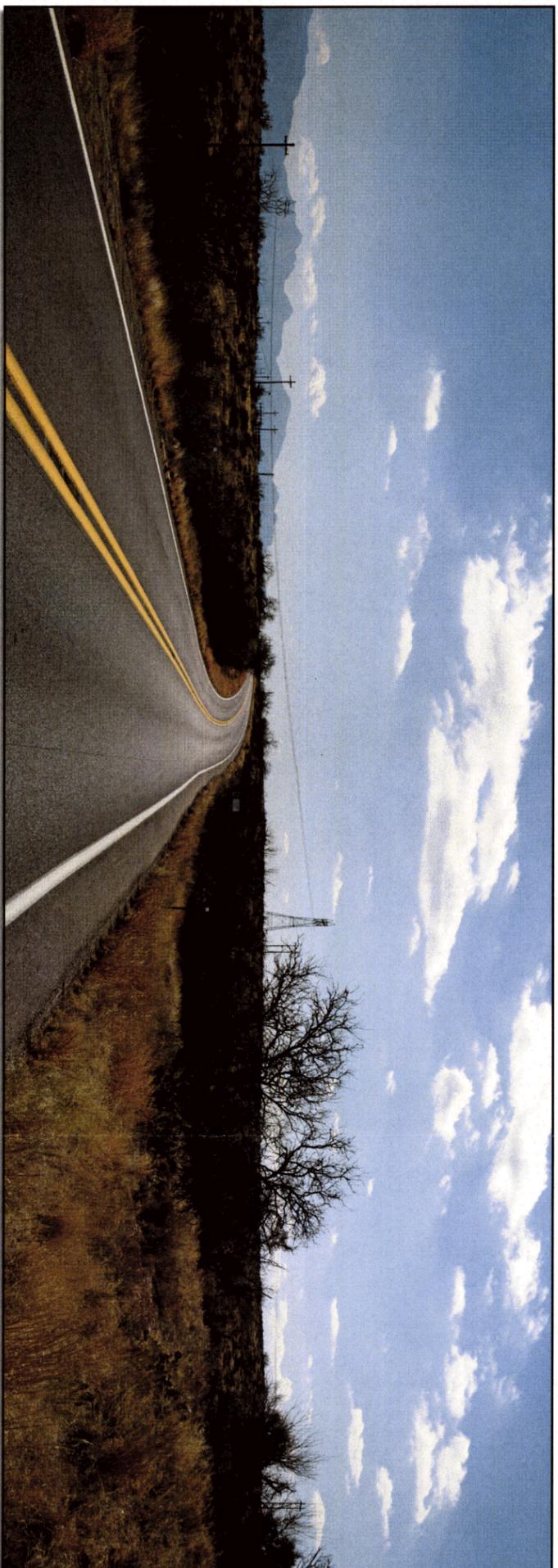


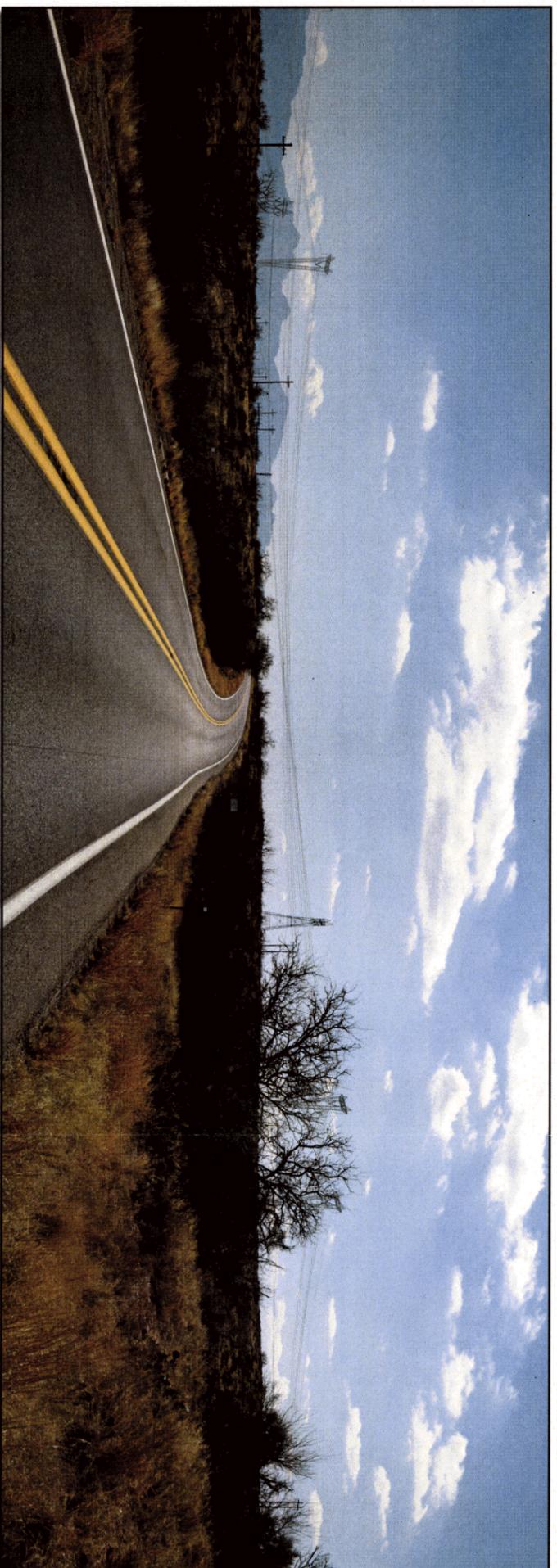
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 Simulations were prepared using three-dimensional structure models provided by the owner's engineer.  
 Facility locations, colors, and heights will differ based on final engineering and design.



**Existing Condition** – View south along State-designated Scenic Pinal Pioneer Parkway (SR 79). Existing 500 kV and 115 kV transmission lines cross, or are adjacent to, this travel route.



**Photograph Location:** Viewpoint is located 0.4 miles South of the proposed Route.



**Simulation** – The Project (see structure diagram) with typical spans. The Project would parallel existing transmission lines when crossing the travel route. The Project would have skynlined conditions with partial screening due to topography and vegetation.

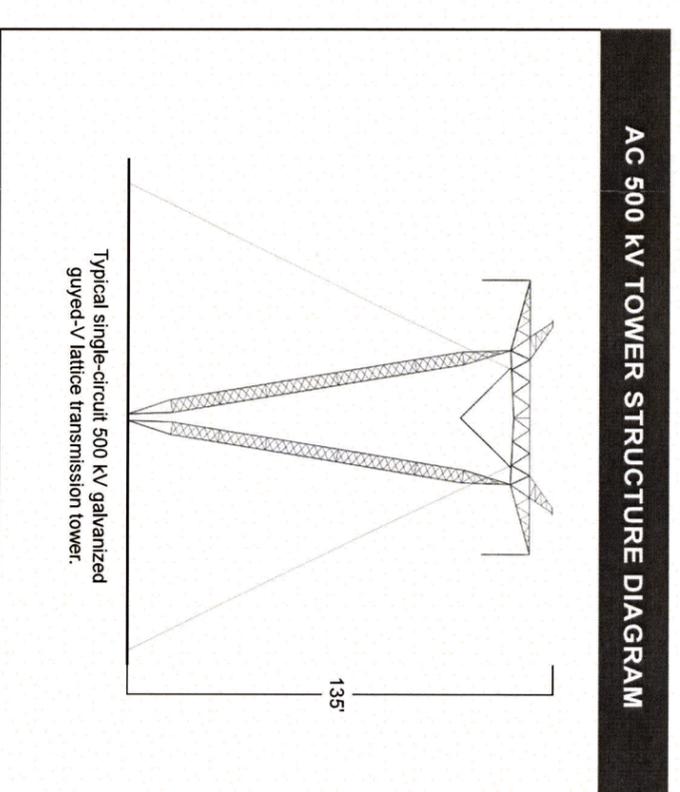
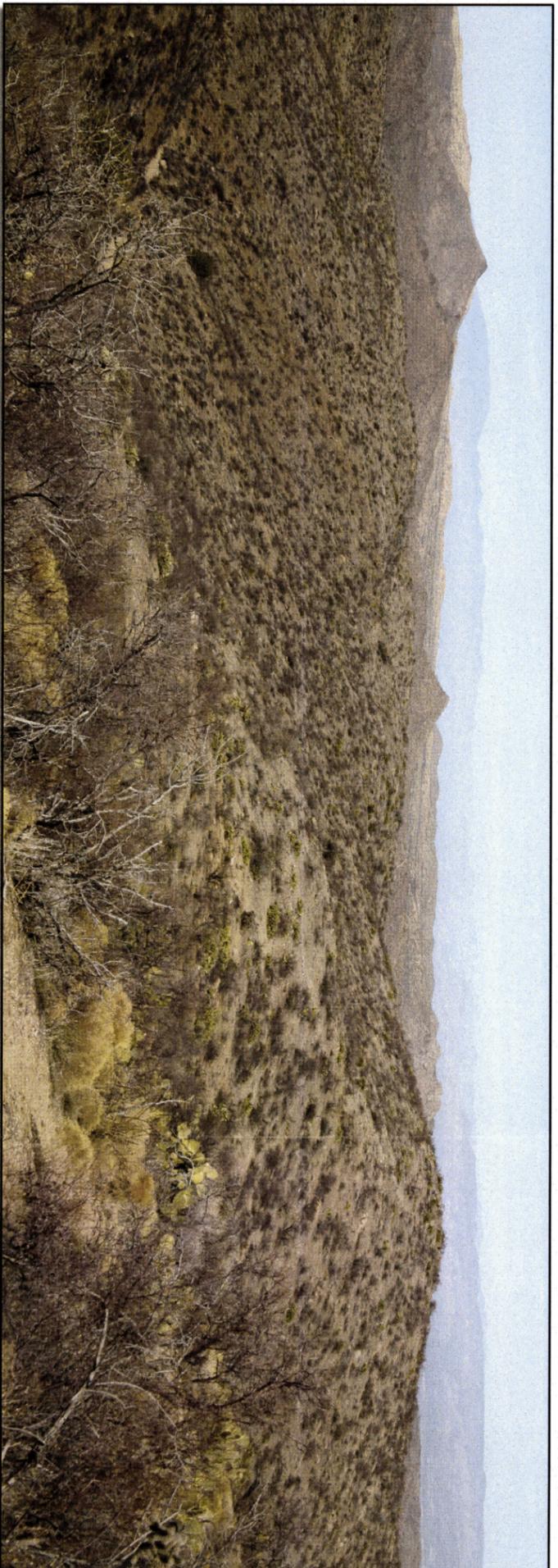


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 Facility locations, colors, and heights will differ based on final engineering and design.

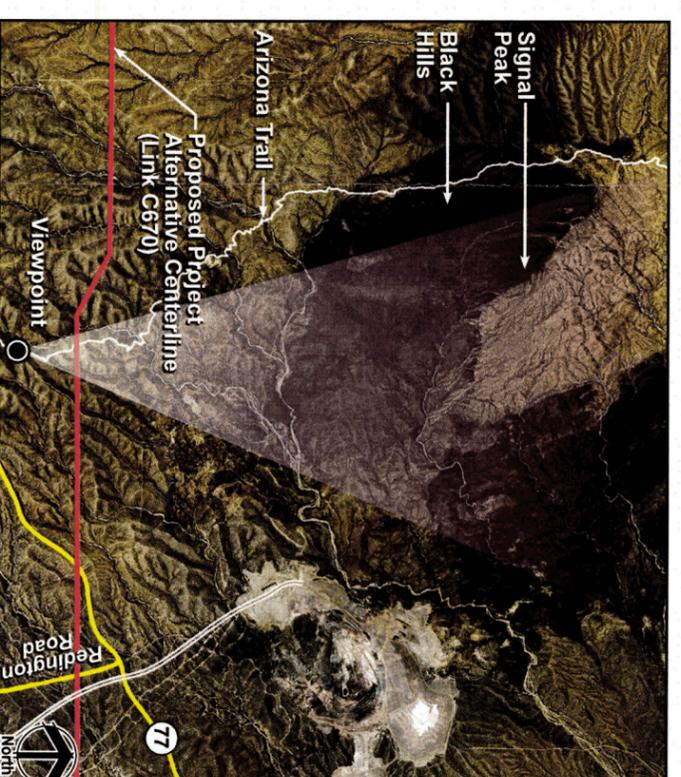


**SunZia Southwest Transmission Line Project**

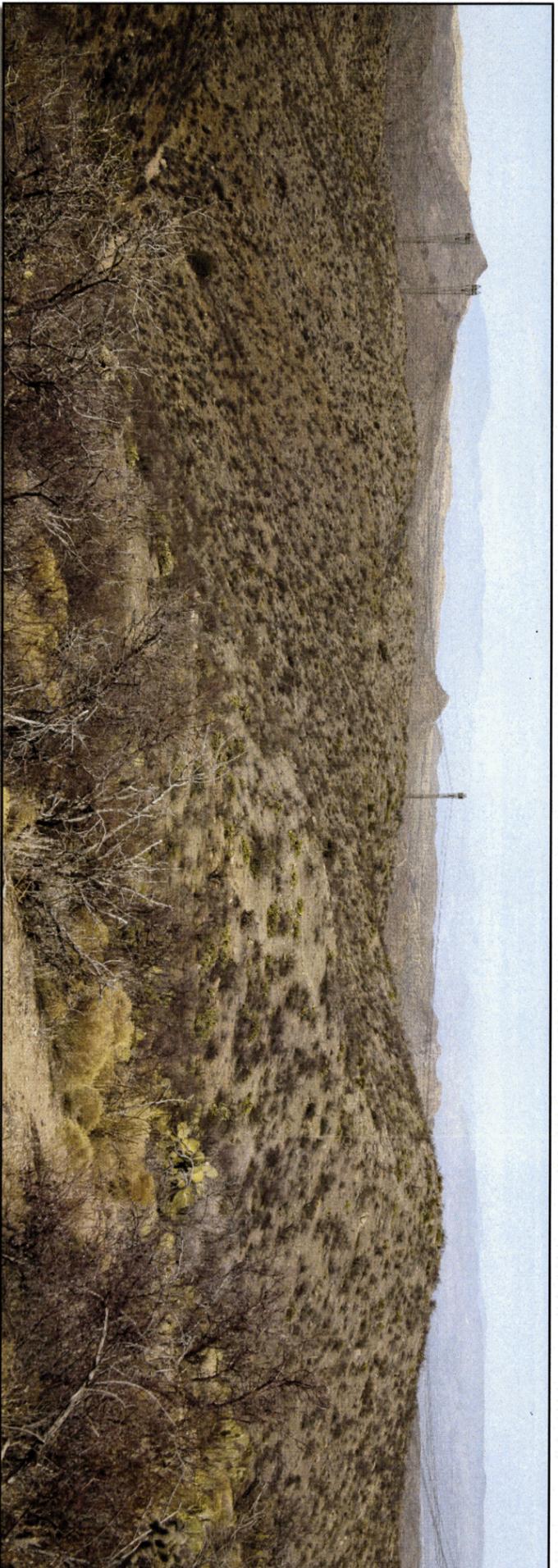
**Exhibit G-4-4**  
 September 2015



**Existing Condition** – View north from the Tiger Mine Trailhead on the Arizona Trail, a nationally designated scenic trail. Terrain in this viewshed includes Signal Peak and Pinal Peak, which are associated with the Black Hills north of Oracle.



**Photograph Location:** Viewpoint is approximately 0.7 mile from proposed transmission lines.



**Simulation** – The Project (see structure diagram) with typical spans. The Project would be backdropped by adjacent terrain.

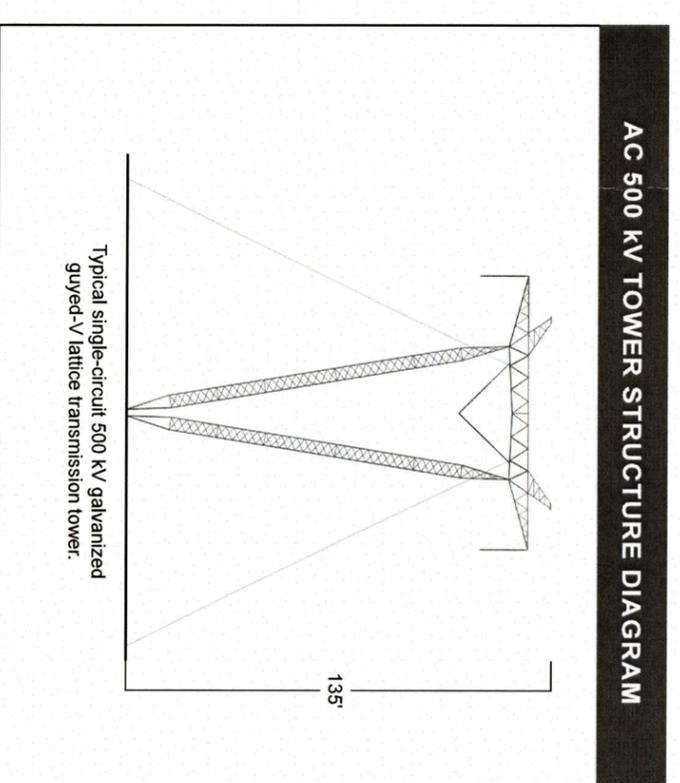
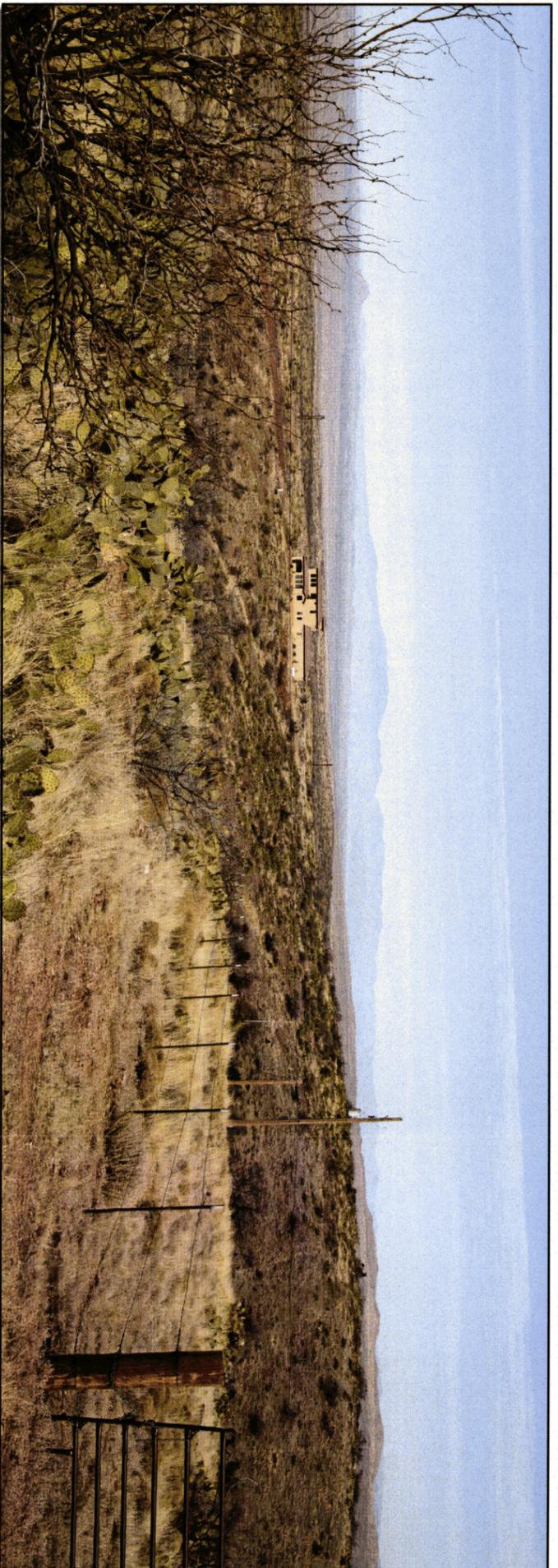


Photo Date and Time: 1-25-11, 1:05 p.m., Focal Length: 50mm  
 Simulations were prepared using three-dimensional structure models provided by the owner's engineer.  
 Typical structures would range between 125 to 160 feet above ground with a span of 1,000 to 1,500 feet. Typical conductor sag would be 45' feet above ground.  
 Facility locations, colors, and heights will differ based on final engineering and design.

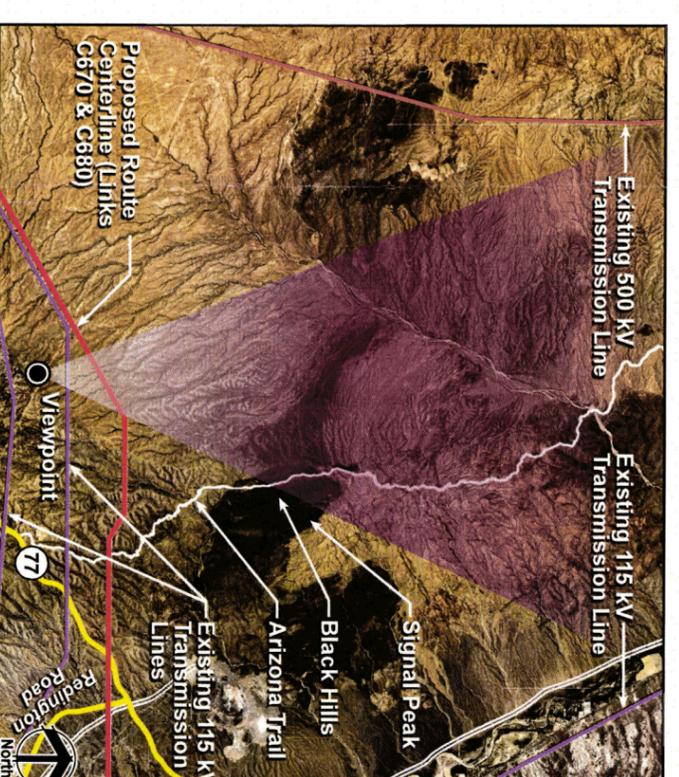


**SunZia Southwest Transmission Line Project**

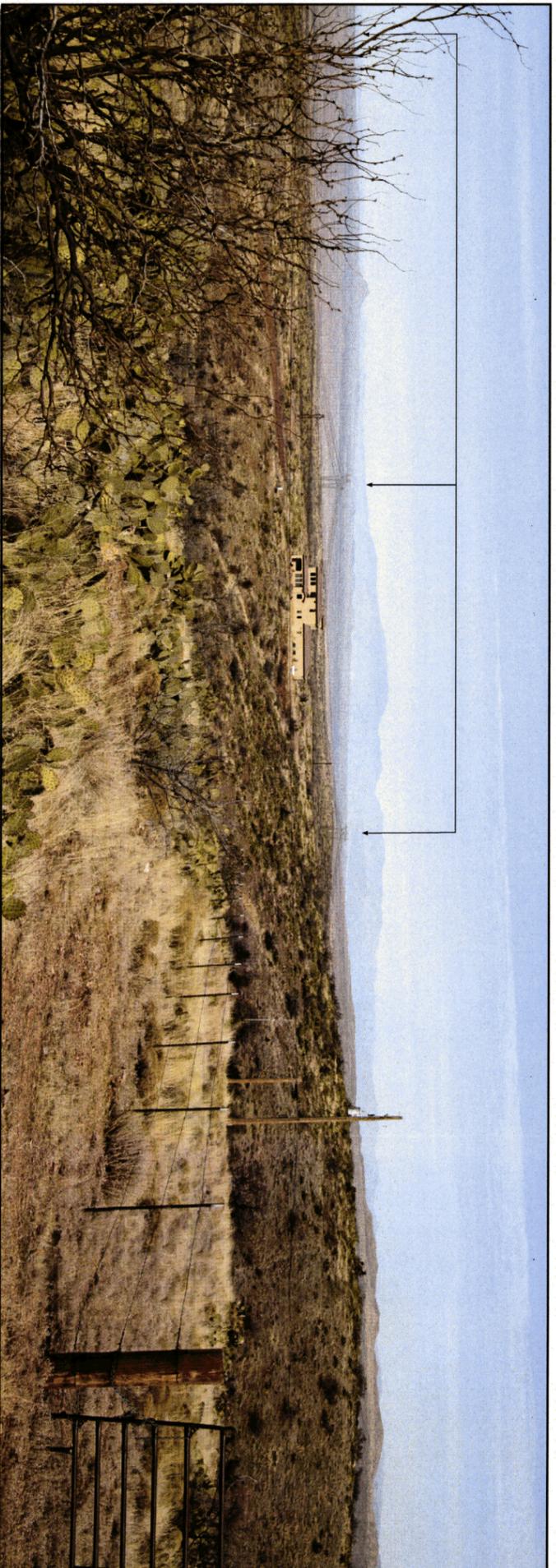
**Exhibit G-4-5**  
 September 2015



**Existing Condition** – View north from residences near Oracle toward an existing 115 kV transmission line. Adjacent scenery includes Signal Peak and the Black Hills.



**Photograph Location:** Viewpoint location is approximately 1.0 mile South of the proposed Route.



**Simulation** – The Project (see structure diagram) with typical spans. The Project would be backdropped by adjacent terrain and viewed in context with an existing 115 kV transmission line.

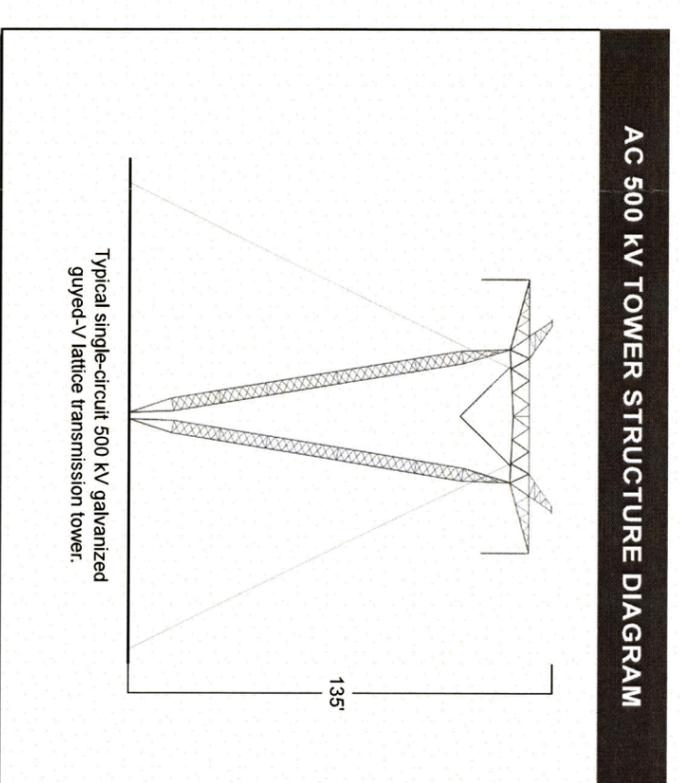


Photo Date and Time: 1-25-11, 12:48 p.m. Focal Length: 50mm  
 Simulations were prepared using three-dimensional structure models provided by the owner's engineer.  
 Typical structures would range between 125 to 160 feet above ground with a span of 1,000 to 1,500 feet. Typical conductor sag would be 45' feet above ground.  
 Facility locations, colors, and heights will differ based on final engineering and design.



SunZia Southwest Transmission Line Project

EXHIBIT G-4-6

September 2015

**Exhibit H**

## EXHIBIT H – EXISTING PLANS

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As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

*“To the extent applicant is able to determine, state the existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site or route.”*

---

Exhibit H-1 – Summary of Existing Plans

Exhibit H-2 – Copy of letter and written responses

### EXHIBIT H-1 – SUMMARY OF EXISTING PLANS

Land management decisions, land use plans and the development approval process are the responsibility of the Arizona State Land Department, for Arizona State Trust Lands, and cities or counties, for private lands.

Existing and future land uses are mapped in Exhibits A-2 and A-3, respectively. As part of the land use study, general and comprehensive plans adopted by cities and counties with jurisdiction within the six-mile wide Project corridor were reviewed. These include Pinal, Pima, Cochise, Graham, and Greenlee counties and the cities of Coolidge, Eloy, and Willcox. Representatives from these cities and counties participated in the stakeholder group and open house meetings for the planning process, through which the alternative routes were identified, during the environmental review and study period leading to the issuance of the Record of Decision (ROD) by the Bureau of Land Management (BLM).

During the National Environmental Policy Act (NEPA) process, members of the SunZia Project study team also met with representatives from the Department of Defense (DOD), BLM, Bureau of Reclamation (BOR), Arizona State Land Department (ASLD), Arizona Department of Transportation (ADOT), Arizona Game and Fish Department (AGFD), United States Forest Service (USFS), National Park Service (NPS), and the aforementioned counties and cities, as well as legal representatives from private land owners within the regional study area. In 2015, letters were sent to the jurisdictions (listed in Table H-1) to provide project information, identify the Proposed Route, and request new or additional information regarding plans for development. Exhibit H-1 provides a Summary of Existing Plans. Exhibit H-2 provides a copy of the 2015 letter and written responses.

## Planned Land Use

### **Greenlee County**

The Proposed Route (Link B161) crosses the southern portion of Greenlee County entirely on lands managed by the BLM, which is designated rural, and most of which is undeveloped. The *Greenlee County Comprehensive Plan (2003)* depicts how the citizens, business people, landowners, and elected and appointed officials believe the County should develop in the future. The Plan is only advisory, is not a plan of development, and focuses attention on the perceived needs. No foreseeable future developments have been identified in the area of Greenlee County traversed by the Proposed Route.

### **Graham County**

The *Graham County Comprehensive Plan (1996)* contains land use policies designed to guide the locating of specific land uses, rather than having a very general countywide land use map. The goals described in the county plan outline a desired outcome and provide a vision of what Graham County currently offers and wants to continue to provide its residents and visitors through the orderly growth and development of those lands within its jurisdiction. The portion of the Proposed Route traversing Graham County is located entirely on lands managed by the BLM and ASLD. No specific development plans have been identified at this time, with respect to the lands crossed by the Proposed Route in Graham County.

### **Cochise County**

The Land Use Element of the *Cochise County Comprehensive Plan (2006) amended (2015)* identifies where and how growth in the county should occur with the goal of promoting development that occurs in a manner that preserves open space, agriculture and ranching resources, wildlife corridors, hydrologic recharge areas, floodplains, geologic features, historic, archaeological, or cultural resources, and arable soils.

A recent amendment to the Comprehensive Plan includes the Renewable Energy Element, for which a high resolution land use suitability analysis for locating utility-scale solar facilities was conducted by the University of Arizona in 2013. The study shows over 770,000-acres of high potential for small scale solar projects of 5 megawatts (MW) or less, and over 640,000-acres of high potential for large scale solar projects greater than 5 MW throughout the county.

As a governmental entity, Cochise County directly and indirectly influences energy efficiency in the county through its planning activities. According to the county plan, one main goal is to support the development of local renewable energy projects and technologies. Implementation of

that goal includes the following policies: (a) Encourage utility-scale renewable energy projects, using the University of Arizona's Renewable Energy Opportunity Analysis and other resources as a guide for determining the suitability of proposals in any one location; (b) Encourage renewable energy business development; (c) Support renewable energy employment training opportunities at local colleges; and (d) Permit flexible site development standards.

The Proposed Route enters Cochise County on Arizona State Trust Land that is undeveloped. According to the Cochise County Comprehensive Plan, the areas surrounding Willcox that are located within the Proposed Route study corridor are categorized as follows:

- Category B: Community Growth Areas, which includes those areas adjacent to Category A: Urban Growth Areas, as well as the larger unincorporated communities of the County, which are experiencing growth. These are areas in transition from a traditional rural environment to a more urbanized environment. Lands located within the project corridor for the Proposed Route within this area have the following designations:
  - "Neighborhood Conservation" (NC), is an area that has an established character, is primarily residential, and needs special rezoning protections to maintain the character of land use that occurs, in general, on lot sizes of one acre or less, located approximately 1.5 to three miles south of Link C110 between mile posts 5 through 8.
  - "Developing" (DEV), are areas experiencing non-rural growth rates that are developed with scattered mixed residential, business or industrial, and agriculture-related uses and that ultimately will accommodate future growth as the more populated areas reach build-out. Most of the area surrounding the Willcox city boundary is within this designation.
  - "Enterprise" (ENT), is an area that has an established pattern of commercial and/or industrial land use; any future development should follow that trend. The area surrounding Cochise County airport just west of Willcox is under this designation.
- Category D: Rural Areas include the outlying rural areas between cities and unincorporated communities and are characterized by a low rate of growth; unimproved roads; low density, large lot rural residential development; agricultural production; and large tracts of undeveloped private and public lands. Continuing through Cochise County, the Proposed Route (Links C212, C260, C261, and C201) crosses primarily undeveloped land within this category.

The route crosses Arizona State Trust Land primarily dedicated to grazing (Link C441). The Nature Conservancy lands are located along the San Pedro River, north of the site where the Proposed Route crosses the river. No planned developments are crossed by, or located within the study corridor of the Proposed Route in Cochise County.

## City of Willcox

The Proposed Route study corridor crosses private land located within the City of Willcox planning area south of Link C110 (approximately between mileposts 9 through 14). This area is designated Low Density Residential/Rural according to the *City of Willcox General Plan (2009)*, with agriculture as the primary use.

## **Pima County**

The most recent update to the *Pima County Comprehensive Plan (2007)* is called *Pima Prospers (2015)*. The plan focuses on regional infill and logical suburban expansion of some parts of the unincorporated area being or having been reviewed by municipalities in their planning.

The Proposed Route enters Pima County (Link C441) in the San Pedro Planning Area as described in Pima Prospers (2015) on Arizona State Trust Land dedicated to grazing. County-owned conservation/preservation lands exist along the San Pedro River and to the west of the Proposed Route. Properties identified as preserve lands and owned in fee by Pima County are designated Resource Conservation (RC) in the land use plan. The remainder of the area within the study corridor, approximately 16 miles of the Proposed Route traversing Pima County, is undeveloped land owned by the State of Arizona and designated Low Intensity Rural (LIR). The definition of the RC and LIR land use designations as described in the Pima County Comprehensive Plan (2001) is provided below. No specific planned developments have been identified in these areas.

### **Low Intensity Rural (LIR)**

- **Objective:** To designate areas for residential uses at densities consistent with rural and resource based characteristics.
- **Residential Gross Density:** Residential gross density shall conform to the following:
  - 1) Minimum – none
  - 2) Maximum – 0.3 residences per acre (RAC).
- **Residential Gross Densities for Developments Using Transfer of Development Rights (TDRs):** Projects within designated Receiving Areas utilizing TDRs for development shall conform to the following density requirements:
  - 1) Minimum – none
  - 2) Maximum – 0.3 RAC.

### **Resource Conservation (RC)**

- **Objective:** To designate publicly-owned lands that are public resource lands and preserves that protect sensitive and high-value biological, resource value, cultural, recreational, and other sensitive resources lands. These do not include private or state

trust lands, whether or not they are leased by the County for open space purposes. If these lands become privately held during the lifespan of this plan, they will be treated as Resource Sensitive unless otherwise designated through a plan amendment process.

- Residential Gross Density: None, other than allowances for life estates, ranch caretakers and similar uses.

## Pinal County

The *Pinal County Comprehensive Plan (2009) updated (2014)* was reviewed in order to identify planned land use and growth areas located in the vicinity of the Proposed Route. The Proposed Route enters Pinal County on Arizona State Trust Land along Link C450 (milepost 5) and continues through and near multiple areas designated in the plan as “Moderate Low Density Residential,” in and around the communities of San Manuel and Oracle (Link C670). Existing homes in areas surrounding San Manuel and Oracle are widely dispersed and located within the area designated “very low residential” according to the plan.

The Proposed Route crosses the Tri-Communities and West Pinal Growth Areas as described in the Growth Area Plan of the Comprehensive Plan.

- **Tri-Communities Growth Area:** The SR 77 corridor extending from the Tucson metropolitan area through Oracle Junction to the Town of Mammoth is the spine of the Tri-Communities Growth Area. Growth is anticipated to occur in this area due to its proximity to Tucson, state highway access and environmental resources. The Tri-Communities Growth Area identifies High and Mid-Intensity Mixed Use Activity Centers at Oracle Junction, a Mid-Intensity Activity Center in San Manuel and Low Intensity Activity Centers in Oracle and Mammoth.
- **West Pinal Growth Area:** The West Pinal growth area encompasses much of the cities of Casa Grande, Eloy, Coolidge, Florence, and Maricopa. Within this growth area, the plan identifies a mix of High and Mid-Intensity Mixed Use Activity Centers and numerous large parcels of employment land identified by the municipalities. The development of these activity centers and employment areas will significantly add to the job base of Pinal County. The residential development planned within the activity centers will also change the development pattern considerably within this Growth Area.

The Proposed Route (Link C680) crosses the Saddlebrooke Ranch Planned Area Development (PAD) Overlay District, parallel to the existing APS 115 kV transmission line near the northern boundary of the district. Land uses described in the PAD, as approved by Pinal County, include single family and multi-family residential, commercial, resort, golf course, open space, industrial, and a utility corridor.

According to the Pinal County Comprehensive Plan, the area north of the Proposed Route (Links C840 and C850) near the existing Coolidge Airport in Pinal County has been identified for future development of an Aviation-Based Commerce Center. The 47-square-mile area is between the CAP canal and SR 79 on Arizona State land. No specific plans for development of this area have been identified.

### City of Coolidge

The Growth Areas Element of the *City of Coolidge General Plan (2014)* describes the focus of each of four different growth areas within the planning area of the city. The Proposed Route would cross Growth Area 4, which is a large area of state trust lands surrounding isolated pockets of private property. No development within this growth area is expected.

The area surrounding the Pinal Central Substation is given the land use classification of “Urban Neighborhood”. This designation makes up about 50 percent of the total land area of the city according to the General Plan. Most of the land crossed by the Proposed route and within the study corridor, including the Pinal Central Substation, in this area is designated “Agricultural” (AG), with a few areas north of the Proposed Route study corridor designated “Planned Area Development” (PAD), and “General Industrial” (I-2).

The Coolidge General Plan describes the “Urban Neighborhood” land use category as: “providing for a mixture of uses that would typically be found in an urbanized section of land including neighborhood scale commercial services, professional office, single family and multi-family residential at varying densities, community facilities including churches and schools, public utility installations and parks and open space. Within the planning area boundary, the Urban Neighborhood category is located over previously approved planned area developments that provide a mix of uses that are designed with places of character” (City of Coolidge 2014).

The City of Mesa currently owns several acres of land adjacent to SR 87 south of SR 287 within the City of Coolidge boundary and planning area that is designated as “Agricultural” (AG), according to the Coolidge General Plan. Much of this land is currently being sold to private developers and has been annexed by the City of Coolidge. No specific development plans have been identified in this area. (See Exhibit A-3 for specific location).

### City of Eloy

According to the *City of Eloy General Plan (2010)*, the majority of the land within the current City limits of Eloy is designated for residential purposes. The predominant current land use is agriculture. There are also many areas within the City and the Planning Area that have not been developed and remain vacant in natural desert conditions. The Proposed Route does not cross locations within the Eloy incorporated area or planning area; however, the most northern portion

of the city is located just inside the study corridor for the Proposed Route. Within this area are lands designated Medium Density Residential according to the General Plan.

In accordance with the General Plan, the following growth areas described would be within the study corridor for the Proposed Route along Links C880 and C880a as they terminate at the Pinal Central Substation.

- Eloy-Casa Grande Interface: This growth area interfaces with the City of Casa Grande. It includes Eloy's first upscale Master Planned Community as well as other proposed retail establishments, catering to travelers along Interstate 10. Transportation related industries are also ideally suited for this growth area. The area includes a mixture of low to high density residential with some commercial and industrial designated parcels.
- North Central: This growth area includes potential energy hubs for the Pinal Central Substation area. This area includes mostly residential designated land with small five to 10 acre commercial sites and some industrial, designated for airport uses.
- Picacho Vista: This growth area is another potential employment corridor with access to Interstate 10, Highway 87, and the Union Pacific Rail Road. The eastern edge of this area also has the potential for upscale "Resort Style" living given its proximity to the base of the Picacho Mountain range. This Growth Area is focused around industrial and commercial uses with some higher density residential uses.

### **Other Plans**

In order to identify potential developments that may be located in the vicinity, contacts were made with the cities of Benson, Casa Grande, Marana, Safford, and Tucson. Listed below are the existing plans for these areas.

- City of Benson General Development Plan (2002) (2015)
- City of Casa Grande General Plan (2009)
- City of Safford General Plan (2004)
- City of Tucson General Plan (2001) Plan Tucson (2013)
- Town of Marana General Plan Update (2007) (2010)

These cities, along with the jurisdictions previously described in detail above, were sent letters providing Project information, including the identification of the Proposed Route, and a request for new or additional information on plans or planned developments in their areas (Table H-1).

**Table H-1. Entities that Received Letters with Project Information**

Contact Name and Title	Jurisdiction/Agency/Organization
Steve Abraham, <i>Planning Manager</i> cc: Pete Rios, <i>County Supervisor District 1</i> cc: Greg Stanley, <i>County Manager</i>	Pinal County
Lisa Atkins, <i>State Land Commissioner</i>	Arizona State Land Department
Sue Black, <i>Executive Director</i>	Arizona State Parks
Paul David, <i>P.E.</i>	Arizona Department of Transportation
Ernie Duarte, <i>Planning and Development Services Director</i> cc: Michael Ortega, <i>City Manager</i>	City of Tucson
Peter Gerstman, <i>Executive Vice President</i>	Robson Communities
Joe Goodman, <i>Planning and Zoning Director</i> cc: Terry Cooper, <i>County Manager</i>	Graham County
Mary Gomez, <i>Interim Director Community Development</i> cc: Richard Searle, <i>Board of Supervisors District 3</i> cc: James Vlahovich, <i>County Administrator</i>	Cochise County
Brad Hamilton, <i>Zoning Administrator</i> cc: Bill Stevens, <i>City Manager</i>	City of Benson
Chuck Huckleberry, <i>County Administrator</i> cc: Arlan Colton, <i>Planning Director</i>	Pima County
Lesley Meyers, <i>Area Manager</i>	Bureau of Reclamation Central Arizona Project Canal
Rick Miller, <i>Growth Management Director</i> cc: Robert Flatley, <i>City Manager</i>	City of Coolidge
Phillip Ronnerud, <i>Director Planning and Zoning</i> cc: David Gomez, <i>Chairman District 1</i> cc: Deborah Gale, <i>County Administrator</i>	Greenlee County
Lisa Shafer, <i>Planning/Community Development Director</i> cc: Gilbert Davidson, <i>Town Manager</i>	Town of Marana
Jeff Stoddard, <i>Building Inspector</i> cc: Ted Soltis, <i>City Manager</i>	City of Willcox
Paul Tice, <i>Planning and Development Director</i> cc: James Thompson, <i>City Manager</i>	City of Casa Grande
Mike Urton, <i>General Manager</i> cc: Ed Begay <i>Acting Project Manager SCIP</i> cc: John McLaughlin <i>Environmental Compliance BOR</i>	San Carlos Irrigation and Drainage District
John Vlaming, <i>Director Community Development</i> cc: Harvey Krauss, <i>City Manager</i>	City of Eloy
Dustin Welker, <i>Planning and Community Development Director</i> cc: Horatio Skeete, <i>City Manager</i>	City of Safford
John Wesley, <i>Planning Director</i>	Planning Director, City of Mesa

**References**

City of Coolidge. 2014. City of Coolidge General Plan

City of Eloy. 2010. City of Eloy General Plan

Cochise County. 2015. Cochise County Comprehensive Plan

Graham County. 1996. Graham County Comprehensive Plan

Greenlee County. 2003. Greenlee County Comprehensive Plan

Pinal County. 2014. Pinal County Comprehensive Plan

Pima County. 2007. Pima County Comprehensive Plan

Pima County. 2015. Pima Prospers

City of Willcox. 2009. City of Willcox General Plan

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EXHIBIT H-2- COPY OF LETTER AND WRITTEN RESPONSES



August 12, 2015

[ADDRESSEE]

RE: SunZia Southwest Transmission Project

Dear \_\_\_\_\_:

SunZia Transmission, LLC (SunZia) plans to file an application for a Certificate of Environmental Compatibility (CEC) for the SunZia Southwest Transmission Project with the Arizona Power Plant and Transmission Line Siting Committee (Siting Committee) within the next 30 days. The proposed project involves the development of two new 500 kV electrical transmission lines and associated facilities originating at a new substation (SunZia East) in Lincoln County, New Mexico, and terminating at the existing Pinal Central Substation in Pinal County, Arizona. The Arizona portion of the transmission line is approximately 200 miles in length and would cross Arizona State Trust Land administered by the Arizona State Land Department (ASLD), Bureau of Reclamation (BOR), Bureau of Land Management (BLM), and private lands located within Greenlee County, Graham County, Cochise County, Pinal County, Pima County, City of Coolidge, and within the planning boundaries of the City of Eloy, Arizona. The SunZia project application will be brought before the Siting Committee to request approval of a CEC for the proposed route, as shown on the Project map (see enclosure).

Arizona Administrative Code Rule R14-3-219 directs an applicant to include in its application an Exhibit H addressing the following:

"To the extent the applicant is able to determine, state the existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site or route."

This letter is intended to offer an opportunity for your agency to provide any information or comments regarding development plans for inclusion in the application. We respectfully request your response in writing; specifically, please advise us of any existing or future plans that may have changed since the completion of our data collection.

To allow your information to be included in the CEC application, please reply to EPG, on behalf of SunZia Transmission LLC, by August 28, 2015 at the address above.

Thank you for your cooperation.

Sincerely,

Mickey Siegel, Project Manager  
Environmental Planning Group

Enclosure: SunZia Southwest Transmission Project Map

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EXHIBIT H-2

AUG 18 2015



**CITY OF ELOY**  
ARIZONA  
COMMUNITY DEVELOPMENT DEPARTMENT

August 17, 2015

Mr. Mickey Siegel  
Project Manager  
Environmental Planning Group  
4141 North 32<sup>nd</sup> Street, Suite 102  
Phoenix, AZ 85018

RE: SunZia Southwest Transmission Project

Dear Mr. Siegel:

The City of Eloy has received your correspondence of August 12, 2015. Our staff has reviewed the proposed corridor study area on the attached map and would like to inform you that the proposed SunZia Southwest Transmission Project it is **not** currently located within our Planning Area or incorporated area. As of February 9, 2015 a portion of this area became part of the City of Coolidge through an annexation and an expanded area transitioned from our planning area to their Planning area as of August 2014.

Enclosed is a map for your review which illustrates the City of Eloy's amended Planning Area in more detail. Please feel free to contact me at (520) 466-2578 if you require additional information or have any questions.

Regards,

A handwritten signature in black ink, appearing to read "Jon Vlaming", is written over a circular stamp or watermark.

Jon Vlaming  
Community Development Director

Cc: Harvey Krauss, City Manager

1137 W. HOUSER RD, ELOY, ARIZONA 85131  
PH: 520-466-2578  
FAX: 520-464-1438

*"RIGHT IN THE HEART OF ARIZONA'S FUTURE"*

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EXHIBIT H-2



COUNTY ADMINISTRATOR'S OFFICE

PIMA COUNTY GOVERNMENTAL CENTER  
130 W. CONGRESS, FLOOR 10, TUCSON, AZ 85701-1317  
(520) 724-8661 FAX (520) 724-8171

C.H. HUCKELBERRY  
County Administrator

August 28, 2015

Mr. Mickey Siegel, Project Manager  
Environmental Planning Group  
4141 N. 32<sup>nd</sup> Street, Suite 102  
Phoenix, Arizona 85018

Re: **Your letter of August 12, 2015 Regarding the SunZia Southwest Transmission Project**

Dear Mr. Siegel:

Thank you for your letter notifying Pima County that SunZia LLC (SunZia) plans to file an application for a Certificate of Environmental Compatibility (CEC) for the SunZia Southwest Transmission Project with the Arizona Power Plant and Transmission Line Siting Committee by mid-September 2015. The SunZia project application will be brought before the Siting Committee to request approval of a CEC for the approved route in Arizona. We understand the Bureau of Land Management (BLM) approved SunZia's application for right of way across federal property in January 2015. The 'Preferred Alternative' identified by the BLM in its Record of Decision approves 515 miles of two, single-circuit 500 kV transmission lines and is comprised of 185 miles of federal land, 220 miles of State Trust land and 110 miles of private land in Arizona and New Mexico. This selected route will impact the San Pedro River Valley, including some 20 miles in Pima County, from just north of Benson in Cochise County and running north along the west side of the San Pedro River in Pima County to the San Manuel area in Pinal County.

Construction requirements include right of way corridors for both lines up to 1,000 feet in width, depending on terrain conditions, and towers will be approximately 135 feet in height. The distance between towers will be approximately 1,400 feet, suggesting that approximately 75 towers would be constructed in Pima County. Because of the remoteness of the valley and lack of existing roads, access for construction of the line and tower locations could require up to 75 new access roads that will greatly impact and fragment the landscape and habitat and invite unwanted traffic and uses into this virtually pristine river valley. We have opposed selection of this route and have continuing concerns regarding the ability to mitigate impacts of the selected route on County lands.

EXHIBIT H-2

Mr. Mickey Siegel, Project Manager  
Re: Your August 12, 2015 Letter Regarding the SunZia Southwest Transmission Project  
August 28, 2015  
Page 2

In this area, Pima County purchased three ranches in the San Pedro Valley area, investing just over \$14 million in voter-approved bond funds for this purpose; we own 12,800 acres in fee and hold 54,100 acres in associated State lease lands; essentially creating a 66,000-acre management unit. The SunZia Transmission line would cross through the County-held State lease lands.

In light of the Bureau of Land Management's decision, we request the following:

- Pima County will have equitable status with landowners/land management agencies in the development and execution of the Plan of Development.
- When the alignment crosses lands where Pima County is not the landowner, but is the active, on-the-ground land manager, Pima County requirements for and recommendations on suitable locations for application of Standard and Selective Mitigation Measures will be accommodated.
- The project proponent and Pima County will seek mutual agreement on additional accommodations necessary to preserve the County's ability to rely on lands the County manages for purposes of accomplishing our Sonoran Desert Conservation Plan objective and providing mitigation for our Section 10 Incidental Take Permit from the United States Fish and Wildlife Service where those lands are crossed by the SunZia Transmission Line. Any agreements reached must be codified and enforceable.

We request that you, as the Project Proponent, support this request and recommend same to the Arizona Corporation Commission.

Sincerely,



C.H. Huckelberry  
County Administrator

CHH/mjk  
Attachment

c: The Honorable Chair and Members, Pima County Board of Supervisors  
John Bernal, Deputy County Administrator for Public Works  
Suzanne Shields, Director, Regional Flood Control District  
Chris Cawein, Director, Natural Resources, Parks and Recreation  
Linda Mayro, Director, Sustainability and Conservation  
Diana Durazo, Special Staff Assistant to the County Administrator

**PIMA COUNTY COMMENTS PER ARIZONA ADMINISTRATIVE CODE RULE R14-3-219**

You have requested in your letter of August 12, 2015 that Pima County provide information under Arizona Administrative Code Rule R14-3-219 related to Exhibit H of the application. To the extent applicant is able to determine, state the existing plans of the state, local government and private entities for other developments at or in the vicinity of the proposed site or route. And you have requested that we identify any existing plans or future plans that may have changed. We offer the following information regarding our land use and conservation plans for inclusion in Exhibit H as well as other Exhibits required by the ACC Siting Committee under this Rule.

**Pima Progress Comprehensive Plan: Pima County Development Services Department**

The proposed SunZia Southwest electrical transmission corridor, Sub-route 4C2c, is west of and roughly parallels the San Pedro River in far northeastern Pima County, about halfway between the river and Coronado National Forest (Santa Catalina Mountains) to the west. A major update to the Pima County Comprehensive Plan, Pima Progress, was adopted by the Pima County Board of Supervisors in May, 2015. Minor changes to the land use map legend and technical corrections to mapped plan designations on developed or entitled property did not change the intent of planned uses over the previous (2001) Comprehensive Plan in this area (Table 1).

**Table 1. Selected Land Use and Zoning Designations San Pedro Valley / Proposed SunZia Corridor Area August 2015**

**Pima County Comprehensive Plan - Pima Progress**

**Low Intensity Rural (LIR)**

- a. Objective: To designate areas for residential uses at densities consistent with rural and resource-based characteristics.
- b. Residential Gross Density: Residential gross density shall conform to the following:
  - 1) Minimum - none
  - 2) Maximum - 0.3 HAC.
- c. Residential Gross Densities for Developments Using Transfer of Development Rights (TDRs): Projects within designated Receiving Areas utilizing TDRs for development shall conform to the following density requirements:
  - 1) Minimum - none
  - 2) Maximum - 0.3 RAC.

**Resource Conservation (RC)**

- a. Objective: To designate publicly-owned lands that are public resource lands and preserves that protect sensitive and high-value biological, resource value, cultural, recreational, and other sensitive resources lands. These do not include private or State Trust lands, whether or not they are leased by the County for open space purposes. If these lands become privately held during the lifespan of this plan, they will be treated as Resource Sensitive unless otherwise designated through a plan amendment process.
- b. Residential Gross Density: None, other than allowances for life estates, ranch caretakers and similar uses.

**SunZia Southwest Transmission Project Pima County Comments Per Arizona Administrative Code Rule R14-3-219 August 28, 2015 Page 2**

The existing zoning east of the Coronado National forest boundary is all RH-Rural Homestead, which is the dominant rural zoning on private and Arizona State Trust lands in Pima County. The RH zone allows rural residential and other related uses including agriculture on at parcels least 4.13 acres and larger (Table 2).

**Table 2. Pima County Zoning Code**

**Chapter 18.13 - RH RURAL HOMESTEAD ZONE (Excerpt)**

**Sections:**

**18.13.010 - Purpose.**

A. Purpose: This zone is intended to preserve the character and encourage the orderly growth of rural areas in the county. It is intended to encourage rural development in areas lacking facilities for urban development and to provide for commercial and industrial development only where appropriate and necessary to serve the needs of the rural area. (Ord. 1985-187 § 1 (part), 1985)

**18.13.020 - Permitted uses.**

- A. Uses permitted:
  - 1. Single detached dwelling;
  - 2. Manufactured or mobile home or trailer;
  - 3. Guest dwelling: in accordance with Section 18.09.020(G) (General Residential and Rural Zoning Provisions) (proposed);
  - 4. Accessory structures;
  - 5. Crop production, used only for the purpose of propagation and cultivation and not for retail sales, including field crops, truck gardening, berry or bush crops, tree crops, flower gardening, nurseries and aviaries;
  - 6. Reserved;
  - 7. The raising and grazing of livestock;
  - 8. The raising of hogs: in accordance with Section 18.12.020(A)(9) (IR Institutional Reserve Zone);
  - 9. Hog raising projects, which exceed the permitted number of hogs, sponsored by the 4-H Club, Future Farmers of America or other similar nonprofit organization: in accordance with Section 18.12.020(A)(11) (IR Institutional Reserve Zone);
  - 10. The raising of poultry and other small animals;
  - 11. Private stable;
  - 12. Commercial stable or riding school, provided:
    - a. There is a minimum site of ten acres, and
    - b. That all buildings be set back a minimum of one hundred feet from any property line;
  - 13. Community stable, provided:
    - a. The site is a minimum of ten acres,
    - b. The stable shall be located within and not closer than two hundred feet from the boundary of the site or subdivision to be served.

- c. All roads and parking areas shall be surfaced with a dust-proof material to minimize the creation of dust, and
- d. There shall be no outside audio amplification on the site;
- 14. Farm products stand, provided:
  - a. The stand does not exceed seven hundred fifty feet, and
  - b. All other requirements of [Section 18.12.020\(A\)\(15\)](#) (IR Institutional Reserve Zone) are met;
- 15. Animal hospital, provided no structure, shelter, animal run or fenced area be within one hundred feet of any abutting property in a rural or residential zone, and animal runs enclosed within the buildings;
- 16. Governmental uses;
- 17. Public park;
- 18. Public school;
- 19. Child care center;
- 20. Group foster home: In accordance with [Section 18.09.020\(E\)](#) (General Residential and Rural Zoning Provisions);
- 21. Church, provided there is a minimum eighty-foot setback from any property line;
- 22. Health clinic, provided:
  - a. There is a minimum one hundred-foot setback from any property line, and
  - b. The clinic has access onto a paved public road with "collector" classification or higher;
- 23. Home occupation;
- 24. Temporary real estate office: In accordance with [Section 18.17.020\(A\)\(8\)](#) (SR Suburban Ranch Zone);
- 25. Raising of ratties, subject to the following requirements:
  - a. Animals shall be confined within minimum six-foot-high, stock-tight corrals;
  - b. Minimum setbacks for raitte corrals and shelter structures within corrals:
    - Fifty feet from front property line and property lines which abut public maintained roads and ten feet from side and rear property lines;
- 26. Nature reserve.

The pattern of adopted planned land uses on the Pima Prosper planned land use maps (San Pedro Planning Area) for all of the area east of the Coronado National Forest is based on and follows the distribution of Pima County preserve lands generally as depicted on the attached map *SunZia Transmission Route in the San Pedro Valley and Conservation Lands*. Properties identified as preserve lands and owned in fee by Pima County are designated Resource Conservation (RC) on the land use plan, while the remainder, which are predominantly owned by the State of Arizona, are designated Low Intensity Rural (LIR). The RC designation furthers the conservation goals of the County-owned preserve system, while the LIR designation allows very low-intensity rural uses generally consistent with the RH zone.

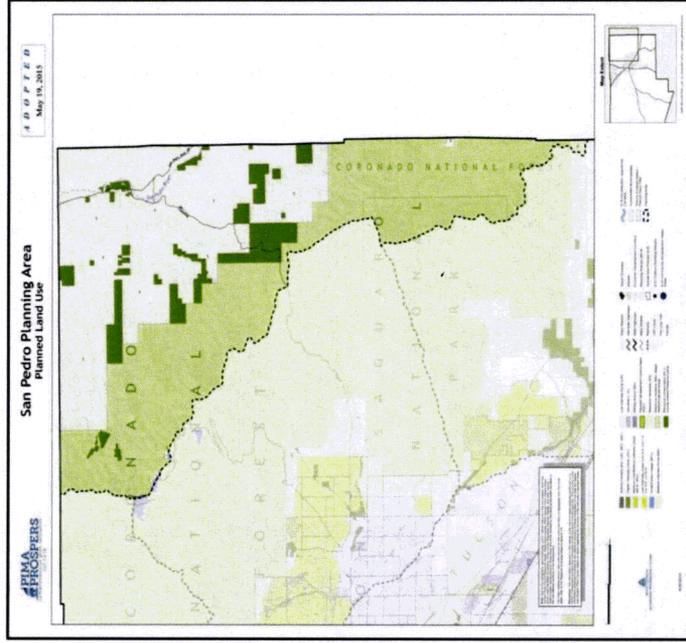


Figure 1. Pima Prosper - San Pedro Planning Area.

Pima County controls ownership or grazing rights essentially over the entire proposed SunZia route in this segment of the San Pedro River valley. East of the SunZia corridor

SunZia Southwest Transmission Project  
 Pima County Comments Per Arizona Administrative Code Rule R14-3-219  
 August 28, 2015  
 Page 5

there is mixed ownership, with State of Arizona and privately-owned property following the San Pedro River, much of it floodplain with partly developed agricultural uses.

The Pima County portion of the San Pedro River Valley has remained among the most purely rural areas in eastern Pima County, with ranching being the dominant land use. Over time there has been an increasing role by Pima County in preservation-related land stewardship as envisioned in the Comprehensive Plan and the Sonoran Desert Conservation Plan (SDCP). Given the ownership, zoning, planned land use patterns and County conservation goals, current patterns are likely to remain the trend for many years to come. See [www.pimaprospers.com](http://www.pimaprospers.com) for the complete Comprehensive Plan.

**Sonoran Desert Conservation Plan: Wildlife Habitat Conservation and Ranch Conservation**

The SDCP identified the San Pedro Valley as highly valuable for habitat and riparian area conservation, preservation of wildlife corridors, cultural resource protection, and ranch conservation, and we have expressed previously our serious concerns regarding impacts from the SunZia Project to County owned and managed lands as show below.

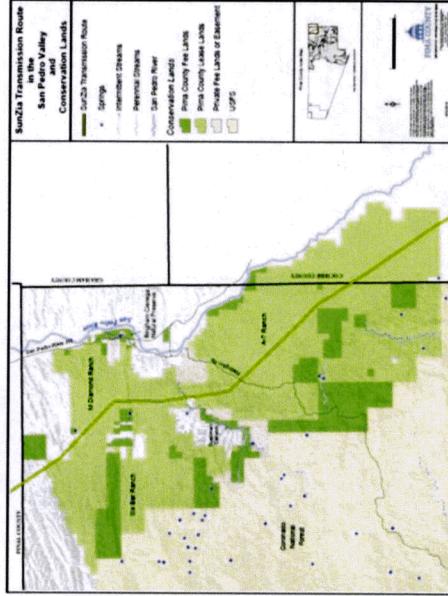


Figure 2. Pima County Conservation Lands in the San Pedro River Valley.

SunZia Southwest Transmission Project  
 Pima County Comments Per Arizona Administrative Code Rule R14-3-219  
 August 28, 2015  
 Page 6

These lands were acquired with voter-approved bond funds with the expressed intent to protect and preserve the natural and cultural values of the San Pedro River Valley for present and future benefit to the citizens of Pima County. To date, Pima County has acquired the Six Bar Ranch, the A-7 Ranch, and the M Diamond Ranch fee lands and grazing leases. Since the date of our 2012 comments, Pima County has become aware of an area of unique biological wealth that lies near the transmission line. Springs and intermittent and perennial streams in the area are shown on the map.

As noted above, the SunZia transmission line passes through an area covered by the Sonoran Desert Conservation Plan. Guidelines that impose conservation standards for development in biologically important areas including the San Pedro Valley have been in place since 2001 when they were adopted into the County's Comprehensive Plan. These standards continue to be implemented and the most current iteration of these conservation standards - the Maaveen Marie Behan Conservation Lands System (CLS) Conservation Guidelines - can be found in the Environmental Element of Pima Prospers - Pima County's Comprehensive Plan 2015 Update.

Since the adoption of the CLS in 2001, Pima County has been acquiring land in the San Pedro River Valley. Since the date of our 2012 EIS comments, Pima County has acquired an additional 620 acres in fee and the associated 8,500-acre State grazing lease at M Diamond Ranch, essentially creating a 140,000-acre County management unit that consists of M Diamond, A-7 and Six Bar Ranches. These lands are complemented by other existing protected lands along the San Pedro and Buehman Canyon as shown on the Conservation Lands map above.

The County manages fee lands and grazing leases as part of its efforts to conserve and protect biological and ecological values of the lands. The stewardship given to the fee-owned land as well as the state grazing leases associated with each ranch will comprise the mitigation area proposed under Pima County's Multi-Species Conservation Plan as required under Section 10 of the Endangered Species Act. This Permit will cover incidental take by activities authorized by Pima County or carried out by Pima County Regional Flood Control District.

Since the date of our 2012 comments, U. S. Fish and Wildlife Service has commenced a programmatic consultation with U. S. Army Corps of Engineers for issuance of a permit under Section 10 of the Endangered Species Act to streamline certain 404 permits for activities covered under Pima County's Multi-Species Conservation Plan. Neither the County's Section 10 nor the programmatic consultation will cover SunZia's activities.

The Maaveen Marie Behan CLS classifications given to the route of the transmission are depicted in the map below. The SunZia Project passes through areas of Biological Core, Multiple Use and Important Riparian Areas located largely on State Trust Land. If the County regulated development in these areas, the mitigation required to offset impacted

SunZia Southwest Transmission Project  
 Pima County Comments Per Arizona Administrative Code Rule R14-3-219  
 August 28, 2015  
 Page 7

land would range from four acres per acre for impacts in the Biological Core and Important Riparian Areas, to two acres per acre impacted in the Multiple Use area.

With their adoption of Pima Prospers on May 19, 2015, the Pima County Board of Supervisors established a County policy to seek compensatory mitigation for all activities that impact the CLS, including transmission lines, such as the SunZia Project. See Pima Prospers Environmental Element - Goal 1; Policy 1.a.

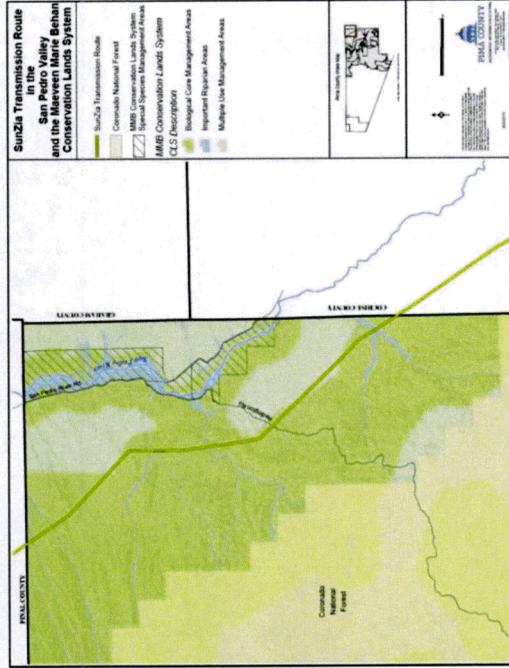


Figure 3. Pima County Conservation Lands System Impacted by the SunZia Project

Since the date of our 2012 comments, the Wildlife Linkages study sponsored by Arizona Game and Fish Department and the Pima County Regional Transportation Authority has been completed. This study was referenced in our letter, and was a basis for our request that direct and indirect impacts to wildlife linkages be considered not only for construction but also vegetation management along the transmission line.

SunZia Southwest Transmission Project  
 Pima County Comments Per Arizona Administrative Code Rule R14-3-219  
 August 28, 2015  
 Page 8

Expected Impacts to County Conservation Planning: A great diversity of significant riparian to County conservation planning efforts are anticipated. Impacts to surface water and riparian areas are likely to result from placement of 75 or more tower structures, construction of access roads, cable pulling and tensioning stations and temporary work areas. Direct impacts to perennial, intermittent and ephemeral surface waters include sedimentation from fugitive dust, access road construction and subsequent erosion, removal of riparian vegetation during construction, or later from "vegetation management" under the constructed line, bank alteration, and contamination due to accidental spills, damage to wetlands, and introduction of invasive species either from vehicular traffic or through re-seeding efforts.

Impacts to uplands would be similar, and would include direct impacts to species covered in Pima County's Multi-species Conservation Plan such as Needle-spined Cactus, Lesser Long-nosed Bat and Desert Tortoise, as well as indirect impacts such as those resulting from vandalism and intrusion into habitat areas by off-road vehicles. Placement of a new transmission line inevitably results in increased public access across a landscape. No matter the steps taken, the lands become much more accessible and remain open because of the need to manage and repair the transmission lines. Other impacts can include poaching of wildlife and plants, and theft of archeological resources, as well as damage to water sources that are important for wildlife and livestock.

It has been our experience that disturbances during construction that are never fully mitigated. A prime example has been the Kinder-Morgan pipeline project's ongoing impacts to the County's Cienega Creek Natural Preserve and Bar V Ranch management and protection in the Altar Valley. Despite mitigation efforts by the company, impacts such as erosion of soil continue for the County to address with no long-term support or ability to reconfigure the impacts due to the constraints now placed by the location of the utility infrastructure corridor.

A less well-known factor that may affect our lands and waters is the need for construction water. Leo Smith, P.E. for many of our County construction projects, estimates that there is a rule of thumb that 50 gallons of water are needed per cubic yard of material to compact soil and conduct dust suppression activities during construction. It is likely that construction water needs for this project will be drawn from local sources along the route of the pipeline with certain impacts to groundwater-dependent ecosystems.

The Energy Policy Act of 2005 designated an electric reliability organization to develop and enforce compliance with reliability standards. North American Electric Reliability Corporation (NERC) is an industry organization, whose authority was conferred by the Federal Energy Regulatory Commission. NERC does not require vegetation clearing per se; it requires power companies to prepare, and implement, a formal transmission vegetation management program to prevent outages.

SunZia Southwest Transmission Project  
Pima County Comments Per Arizona Administrative Code Rule R14-3-219  
August 28, 2015  
Page 9

A reportable outage is caused by "grow-ins" and "fall-ins" or "flashover", which is the movement of electricity across air (see www.nerc.com). Grow-ins are outages caused by vegetation growing into lines from vegetation inside and/or outside of the right-of-way; fall-ins are defined as outages caused by vegetation falling into lines from inside or outside the rights-of-way.

Rather than selective removal, TEP and other utilities are removing woody vegetation that would never grow or fall into the lines, in order to reduce risks of fire and electrical arcs affecting the performance of transmission lines. There is no written policy requiring fuel loads to be reduced, nor are fuel loading calculations or standards used to determine the amount of clearing.

In short, more vegetation is being cleared as each utility begins implementing its plan. In practice, utilities remove far more vegetation than the minimum needed to meet NERC rules, to minimize the need for repeated mobilization of field crews. Inadequate field supervision of contractors has, at times, contributed to the expansion of the footprint of maintenance activities on the landscape.

All trees, woody shrubs and saguaros may eventually be removed along power transmission lines rated at 200kV or higher, whether situated along public or private lands, along with impacts to plants and animals associated with repeated use of mechanical or herbicide treatments. Mechanical clearings may result in significant degradation of archeological resources. The cleared areas will alter fire behavior. In montane areas, the new clearings may serve as fire breaks. In some lower elevation areas, invasion of non-native plants in the disturbed areas may actually increase the fire risk. In all locations, vegetation management will more or less permanently alter the characteristics of wildlife and vegetation habitat under power lines.

Using 2004 voter-approved bond monies, the County acquired Six Bar Ranch, M Diamond and the A-7 Ranch in the San Pedro River Valley. The BLM Preferred Alternative passes right through the County-held State grazing lease for A-7 and M Diamond Ranch and cuts through a number of important conservation areas, wildlife travel corridors and cultural resources sites on the property that are large enough that minor adjustments to the line footprint will not adequately mitigate potential impacts. This alignment would cut across nearly all of the major ranch roads, pastures and key use zones, which can hamper our operation and conservation ranching approach.

SunZia Southwest Transmission Project  
Pima County Comments Per Arizona Administrative Code Rule R14-3-219  
August 28, 2015  
Page 10

Riparian Area and Floodplain Protection Planning: Regional Flood Control District

The Pima County Regional Flood Control District (RFCDD) is a regional agency whose mission is to protect the health, safety, and welfare of Pima County residents by providing comprehensive flood protection programs and floodplain management services.

These services emphasize fiscal responsibility, protection of natural resources and riparian areas, and a balanced multi-objective approach to managing regional watercourses, floodplains, and stormwater resources.

Moreover, as a co-applicant with Pima County for issuance of a Section 10 Permit under the Endangered Species Act, RFCDD has been fully engaged in the development of the Multi Species Conservation Plan and is actively involved in the preservation of riparian areas and habitat as defined by the Sonoran Desert Conservation Plan Meeveen Marie Behan Conservation Lands System described above.

The depicted floodplains in Figure 4 are the regulatory floodplains as identified by the Federal Emergency Management Agency (FEMA) and are subject to regulation under the National Flood Insurance Program including administrative policies and guidance issued by FEMA. It should be noted that critical facilities which include electrical substations are required to be protected from the 500-year flood.

The riparian habitat map in Figure 5 depicts major watercourses and local tributaries and the associated riparian habitat. Disturbance in these areas should be limited and biological surveys should be conducted prior to any disturbance to avoid any impacts to threatened and endangered species. The District discourages construction of a permanent access road along the entire route. In addition to direct disturbance of riparian areas and floodplains, where access roads cross watercourses there is a potential for head-cutting and other erosion problems off of the ROW. There is evidence of this on other linear projects that have been constructed in Pima County. Furthermore, construction activities should be suspended during rainy periods.

EXHIBIT H-2

SunZia Southwest Transmission Project  
 Pima County Comments Per Arizona Administrative Code Rule R14-3-219  
 August 28, 2015  
 Page 11

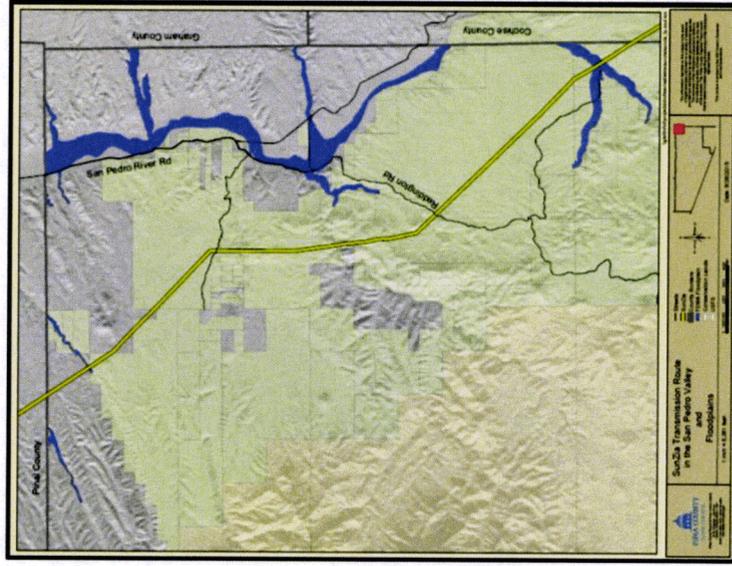


Figure 4. Regulated Floodplains in the San Pedro Valley

SunZia Southwest Transmission Project  
 Pima County Comments Per Arizona Administrative Code Rule R14-3-219  
 August 28, 2015  
 Page 12

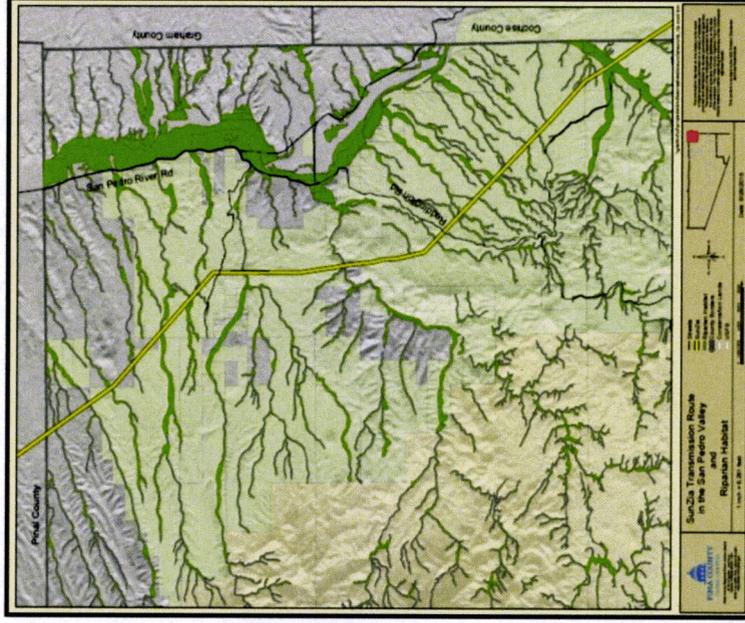


Figure 5. Riparian Habitat in the San Pedro Valley

SunZia Southwest Transmission Project  
 Pima County Comments Per Arizona Administrative Code Rule R14-3-219  
 August 28, 2015  
 Page 13

While electrical transmission lines are not required under Arizona statutes to receive written authorization from county flood control districts, Arizona Revised Statute 48-3616.C, requires that construction plans must be submitted for review and comment. The review would focus on avoiding the placement of transmission towers in FEMA floodplains and erosion hazard areas and minimizing the disturbance of riparian habitat. The exception to this regulatory exemption is that permits will be required for both temporary and permanent access roads to construct and maintain the SunZia Project.

Sonoran Desert Conservation Plan: Cultural Resources & Historic Preservation

Perennial rivers, such as the San Pedro, are major loci of prehistoric and historic human occupations in Pima County, where the site numbers are highest and the distribution of sites is most dense. The San Pedro Valley has been long recognized for its many significant prehistoric and historic sites, many of which are in excellent condition given their remoteness from large modern population centers.

The San Pedro Valley in Pima County is essentially undeveloped. It retains the character of landscapes in the prehistoric and historic past. As such the valley is a place where a sense of history is present today. Tohono O'odham, Apache, Hopi, and Zuni cultural advisors who have visited ancestral villages and gathering areas in the San Pedro Valley have remarked on the sense of history that is embedded in the natural and cultural landscapes. Dalton Taylor of Hopi has stated of the San Pedro Valley and ancestral archaeological sites that, "the only thing I ask for is protection, because this place is like our history books". Other cultural advisors have made similar pleas to protect and preserve the San Pedro Valley and its unique history.

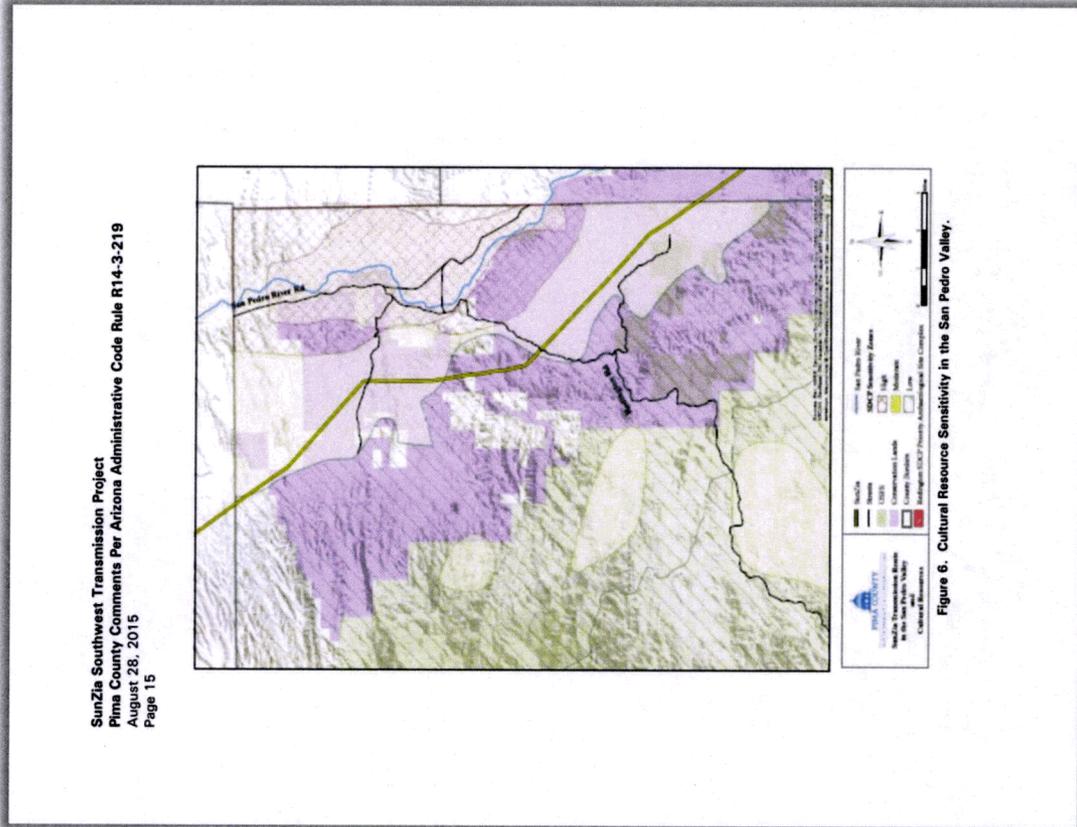
Because of these high cultural values in addition to its diverse and valuable habitat for many species, the San Pedro River Valley was defined in the Sonoran Desert Conservation Plan (SDCP) as having high value for conservation. This high density of cultural resources has been identified in the SDCP as the "Redington Cultural Resource Complex" shown on the map below and is identified as such in Pima Prospectors. Unfortunately, the proposed SunZia route along the west side of the San Pedro Valley in Pima County has great potential to impact significant archaeological and/or historic resources resulting from construction of the SunZia Project and from indirect impacts such as looting of sites that will result from much greater access to these heritage resources from the many new access roads that will be required for the construction of the Project.

SunZia Southwest Transmission Project  
 Pima County Comments Per Arizona Administrative Code Rule R14-3-219  
 August 28, 2015  
 Page 14

The high archaeological sensitivity of the San Pedro valley is well documented and reflects important prehistoric occupations as well as historic homesteading and ranching. There are dozens of recorded sites in the valley near this corridor, with excellent potential for additional, as yet undiscovered resources. Well-known sites in this area include the prehistoric Reeve Ruin, Redington Ruin, and Bayless Ranch Ruin, as well as an historic cemetery near the river. Many sites are located on County-owned lands that were acquired and are managed specifically to protect and preserve the natural and cultural resources for present and future benefits to the citizens of Pima County.

The proposed SunZia alignment will irrevocably scar the San Pedro Valley, cutting a swath of destruction through many archaeological sites, diminishing cultural and traditional values held by Native American tribes, and scarring the pristine visual character of the valley, predominantly through lands that Pima County is committed to protect in accordance with the Pima County Sonoran Desert Conservation Plan and Pima Prospectors.

EXHIBIT H-2



SunZia Southwest Transmission Project  
Pima County Comments Per Arizona Administrative Code Rule R14-3-219  
August 28, 2015  
Page 16

In summary, Pima County has made significant investment in conservation planning and land acquisition on behalf of its citizens since 2001 to ensure that the San Pedro River Valley and its abundant natural, riparian, and cultural resource values are protected for the benefit of present and future generations. The County's holdings in the area total approximately 140,000-acres under County management that supports ongoing ranching operations, while conserving and protecting biological and ecological values of the lands.

In acknowledgement of the public's mandate, Pima County has adopted an ongoing and long-term commitment to conservation planning espoused in the Sonoran Desert Conservation Plan and Multi-Species Conservation Plan. Moreover, these lands under the County's Sonoran Desert Conservation Plan and Multi-Species Conservation Plan are intended as mitigation lands under that will serve to meet the requirements of the Section 10 Permit of the Endangered Species Act that will be issued to Pima County by the US Fish & Wildlife Service. This Permit will cover incidental take of listed species by activities authorized by Pima County or carried out by Pima County Regional Flood Control District.

These conservation goals have also been recently reaffirmed and adopted by the Board of Supervisors in its 2015 Comprehensive Plan "Pima Prospers."

**Exhibit I**

## EXHIBIT I - ANTICIPATED NOISE AND INTERFERENCE WITH COMMUNICATION SIGNALS

As stated in the Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

*“Describe the anticipated noise emission levels and any interference with communication signals which will emanate from the proposed facilities.”*

---

The Preliminary EMF and Corona Effects Study for the SunZia Southwest Transmission Project was conducted by Power Engineers, Inc., and is included in this Exhibit I (also contained in Exhibit B-1, the Final Environmental Impact Statement - Appendix K). Electric and magnetic fields (EMF) and corona noise levels were analyzed for a variety of conductor configurations and two structure types for the first alternating current (AC) transmission line. In addition, the effects of increased line voltage and adding a second line in parallel were analyzed.

The analysis was based on preliminary structure designs for the SunZia project (see Exhibit G-1). The results of the study were reported for a base case, horizontal guyed-V structure with a three-conductor bundle, and included an analysis of the effects of modifying the bundle or structure type, increases in voltage along the line, and the addition of a second AC or direct current (DC) line in parallel. Adding a second AC or DC line would produce similar results, measured at the outside of the right-of-way (ROW), as compared to a single line.

EMF effects were analyzed at a minimum conductor height. The results of the study conducted for the SunZia transmission line indicate that EMF levels would be below the International Commission on Non-Ionizing Radiation Protection (ICNIRP) reference exposure limits, as measured outside of the transmission line ROW. Arizona does not have any statewide requirements for EMF effects.

Audible noise, radio interference (RI), and television interference (TVI) were analyzed at average conductor height. Values calculated are typically below common limits and guidelines for each effect. Based on the results of this study, audible noise levels would be below Environmental Protection Agency (EPA) recommended values for outdoor areas. Radio frequency interference from the proposed 500 kV transmission lines is expected to be relatively low within a few miles of the line for frequencies near 1 MHz, and near negligible as the frequency increases.

RI and TVI depend on the signal strength to categorize the effects of the interference on reception quality. Values for AM radio interference are approximately at or below typical guidelines, and television interference has no published guidelines for digital television signals, although the interference produced by the transmission lines is likely to be negligible, and thus generally acceptable.

### **Proposed Willow-500 kV Substation and 500 kV DC Converter Station (Option)**

EMF and TVI levels from substations and converter stations are highly controlled through a number of design features. Generally, EMF levels measured at the outside of either a substation or converter station are lower than the EMF levels measured at the outside boundary of a high-voltage transmission line right-of-way, and are thus anticipated to be within acceptable levels. EMF levels would be acceptable at all locations external to the property boundaries of the proposed Willow-500 kV substation, as well as at the DC Converter Station site. There are no sensitive receptors located in proximity to the proposed Willow-500 kV Substation site, such as occupied dwellings or other structures, that could be subject to exposure to EMF or audible noise.

Within substation or converter station sites, magnetic fields are managed by proper physical barriers (fencing) to provide protection to operations and maintenance personnel in accordance with relevant Occupational Safety and Health Association and International Electrotechnical Commission (IEC) standards.

Noise sources associated with high-voltage DC converter stations are typically the same or are very similar to those in AC substations. Voltage transformers are the primary sources of audible noise from operating substations and converter stations. DC converter stations include other equipment, such as dry-cooling tower systems and harmonic filters, which produce noise during operations. All of these noise sources can be managed and mitigated through the use of attenuating surfaces, equipment design, and in some cases, specific noise buffers that are custom-designed for the specific station. Local and national standards typically require continuous sources of noise to be at 55 dBA (broadband steady state) or lower levels at the station property boundaries. Passive measures, including the provision of noise buffer areas at the property boundaries, are very effective in reducing overall noise emissions from the station to meet these standards.

February 8, 2011

## **SOUTHWESTERN POWER GROUP**

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### **SunZia Project** *Preliminary EMF and Corona Effects Study*

*Revision 1*

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116500

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## TABLE OF CONTENTS

<b>1.0 INTRODUCTION.....</b>	<b>1</b>
1.1 Project Discussion.....	1
1.2 Summary .....	1
<b>2.0 DATA .....</b>	<b>1</b>
<b>3.0 ANALYSIS .....</b>	<b>2</b>
<b>4.0 RESULTS OF VARIOUS CONDUCTOR CONFIGURATIONS .....</b>	<b>4</b>
4.1 Electric Field.....	4
4.2 Magnetic Field .....	6
4.3 Audible Noise .....	8
4.4 AM Radio Interference .....	10
4.5 Television Interference .....	13
<b>5.0 RESULTS OF INCREASING LINE VOLTAGE.....</b>	<b>15</b>
5.1 Electric Field.....	15
5.2 Magnetic Field .....	16
5.3 Audible Noise .....	17
5.4 AM Radio Interference .....	18
5.5 Television Interference .....	18
<b>6.0 RESULTS OF ADDING A SECOND LINE .....</b>	<b>20</b>
6.1 Electric Field.....	20
6.2 Magnetic Field .....	21
6.3 Audible Noise .....	22
6.4 AM Radio Interference .....	24
6.5 Television Interference .....	25
<b>7.0 GENERAL SUMMARY OF RESULTS.....</b>	<b>26</b>
<b>APPENDIX A – TRANSMISSION LINE STRUCTURE DRAWINGS.....</b>	<b>27</b>

## LIST OF TABLES

Table 1: Electric Field Results for Various Configurations [kV/m] .....	4
Table 2: Magnetic Field Results for Various Configurations – 100% Loading [mG] .....	6
Table 3: L50 Audible Noise Results for Various Configurations (Foul Weather) [dBA] .....	8
Table 4: L50 Radio Interference for Various Configurations (Fair Weather) [dB $\mu$ V/m @ 1 MHz] .....	11
Table 5: Television Interference for Various Configurations [dB $\mu$ V/m @ 75 MHz] .....	13
Table 6: Electric Field Results for Different Voltages [kV/m] .....	16
Table 7: L50 Audible Noise Results for Different Voltages (Foul Weather) [dBA] .....	17
Table 8: L50 Radio Interference for Different Voltages (Fair Weather) [dB $\mu$ V/m @ 1MHz] .....	18
Table 9: Television Interference for Different Voltages [dB $\mu$ V/m @ 75 MHz] .....	19
Table 10: Electric Field Results for Two Circuits [kV/m] .....	20
Table 11: Magnetic Field Results for Two Circuits – 100% Loading [mG] .....	21
Table 12: L50 Audible Noise Results for Two Circuits (Foul Weather) [dBA] .....	23
Table 13: L50 Radio Interference for Two Circuits (Fair Weather) [dB $\mu$ V/m @ 1MHz] .....	24
Table 14: Television Interference for Two Circuits [dB $\mu$ V/m @ 75 MHz] .....	25

## LIST OF FIGURES

Figure 1: Electric Field Across ROW for Various Configurations .....	5
Figure 2: Electric Field for Five Miles Beyond ROW for Various Configurations .....	5
Figure 3: Magnetic Field Across ROW for Various Configurations .....	7
Figure 4: Magnetic Field for Five Miles Beyond ROW for Various Configurations .....	7
Figure 5: Audible Noise Across ROW for Various Configurations .....	9
Figure 6: Audible Noise for Five Miles Beyond ROW for Various Configurations .....	9
Figure 7: Corona Effects with Increasing Frequency .....	10
Figure 8: AM Radio Interference Across ROW for Various Configurations .....	12
Figure 9: AM Radio Interference for Five Miles Beyond ROW for Various Configurations .....	12
Figure 10: Television Interference Across ROW for Various Configurations .....	14
Figure 11: Television Interference for Five Miles Beyond ROW for Various Configurations .....	15
Figure 12: Electric Field Across ROW for Different Voltages .....	16
Figure 13: Audible Noise Across ROW for Different Voltages .....	17
Figure 14: AM Radio Interference Across ROW for Different Voltages .....	18
Figure 15: Television Interference Across ROW for Different Voltages .....	19
Figure 16: Electric Field Across ROW for Two Circuits .....	21
Figure 17: Magnetic Field Across ROW for Two Circuits .....	22
Figure 18: Audible Noise Across ROW for Two Circuits .....	23
Figure 19: AM Radio Interference Across ROW for Two Circuits .....	24
Figure 20: Television Interference Across ROW for Two Circuits .....	25
Figure 21: Horizontal Transmission Structure Configuration .....	28
Figure 22: Delta Transmission Structure Configuration .....	29
Figure 23: DC Tower Configuration .....	30

## 1.0 INTRODUCTION

### 1.1 Project Discussion

Southwestern Power Group (SWPG) is the project manager for the development of the SunZia Southwest Transmission Project, which includes approximately 500 miles of 500 kV transmission lines. This project would consist of one or two 500 kV lines in parallel running from central Arizona in to central New Mexico to transport primarily renewable energy into areas of demand. The Project is being permitted to accommodate a single 500 kV AC transmission line with an expected capacity of 1,500 MW and a future second 500 kV transmission line that would be either an AC line rated at 1,500 MW or a DC line rated at 3,000 MW.

POWER Engineers, Inc.'s (POWER) engineering service for this study was to perform calculations to determine the field and corona effects of the transmission line(s) and compare the results to applicable standards and guidelines. The analysis included determining predicted electric and magnetic fields, audible noise, and AM radio and television interference.

### 1.2 Summary

Electric and magnetic fields (EMF) and corona effect levels have been analyzed for a variety of conductor configurations and two structure types for the first AC transmission line. In addition, the effects of increased line voltage and adding a second line in parallel were examined. Electric and magnetic fields were analyzed at a minimum conductor height. Audible noise (AN), radio interference (RI) and television interference (TVI) were analyzed at average conductor height. Values calculated are typically below common limits and guidelines for each effect. Based on the results of the analysis, radio frequency interference from the proposed 500 kV transmission lines is expected to be relatively low within a few miles of the line for frequencies near 1 MHz, and near negligible as the frequency increases. Specific frequencies of concern could be analyzed for more exact values and their behavior with varying distance from the line. Calculations were based on preliminary structure designs that may change as detailed design is performed. Any changes to the characteristics of the conductors or their arrangement could affect the results of the study and should be further investigated.

## 2.0 DATA

EMF, audible noise, and radio and television interference from a transmission line are based on the electrical and physical characteristics of the transmission line. Specifically, these factors are driven by: the voltage and current loading of the line; the physical conductor characteristics and bundling; relationships of each phase conductor to the other phases and shield wires; and the heights of the conductors from the ground. The following data was used for the analysis. Should any of this data change, the results will also change.

- For the 500 kV line, a maximum operating voltage of 105 % of nominal voltage was used for electric field, audible noise, radio interference and television interference analysis, except where otherwise noted.

- Additional sensitivity cases were run for a single line to examine the change in effects at 110%, 115%, and 120% of nominal voltage as portions of these lines may experience higher voltage due to reactive compensation installed for the long lines.
- A maximum loading of 1,650 amps per phase (1,500 MVA nominal at 105% of nominal voltage) was assumed for each 500 kV AC line analysis. For DC analysis, a pole current of 3,000 amps was used. Balanced loading was assumed for all cases.
- Three conductor bundling configurations were examined on the base AC horizontal guyed V structure, all with 18 inch bundle spacing:
  - A 3-bundle 1590 kcmil ACSR Lapwing conductor (base case)
  - A 4-bundle 954 kcmil ACSR Rail conductor (as a mitigation option)
  - A 4-bundle 1590 kcmil ACSR Lapwing conductor (as a mitigation option)
- A delta structure was also examined as a mitigation option for the base AC line, using the initial 3-bundle 1590 kcmil ACSR Lapwing conductor.
- There are two shield wires on each structure:
  - One 7/16 inch EHS steel
  - One optical ground wire (OPGW) GW4830 (diameter 0.669)
- The conductor spacing and arrangement was assumed as labeled on the structure drawings provided for reference in Appendix A. The assumed phasing for this first line is A-B-C, left to right, although with one line, the actual phasing has no effect.
- The phasing of the second AC circuit was varied to show the effects of different phasing arrangements between the two circuits. The second AC line was assumed to also be a horizontal configuration as the delta configuration does not provide significant benefit.
- If the second line is DC, the positive pole is assumed to be on the inside side of the ROW (adjacent to the AC line). If the positive and negative poles are swapped, there will be slight changes in the DC fields.
- The Right-of-Way (ROW) width is assumed to be 200 feet centered on the structure. For a second line, it is assumed that an identical ROW would be located immediately adjacent, for a separation of 200 feet from centerline to centerline of the structures.
- A maximum sag value of 57.5 feet was used for the AC phase conductors, while the shield wires sag 85% of this value.
- A maximum sag value of 65 feet was used for the DC pole conductors, while the shield wires sag 85% of this value.
- Calculations were based on an assumed elevation of approximately 5,000 feet, based on the typical elevations in the area of this project of greatest concern (near the White Sands Missile Range (WSMR)). The actual elevation of the line varies from around 2,000 feet in the west to 6,000 feet in the east.

### 3.0 ANALYSIS

The environmental field effects analysis for AC cases was performed using the Bonneville Power Administration's (BPA) Corona and Field Effects Program (CAFEP) software on the various transmission line structure and conductor configurations. CAFEP uses the electrical and physical

characteristics of the transmission line to calculate resulting fields and interference effects from the transmission lines. It should be noted that the radio interference values calculated by CAFEP are 2 dB greater than would be measured with modern equipment using the standard IEC/CISPR quasi-peak detector; therefore the RI results in this report are adjusted down by 2 dB to account for the change.

For the AC/DC hybrid transmission line corridor SESEnviroPlus (Enviro) by Safe Engineering Services & technologies ltd. was used. This software package was used due to the fact that the CAFEP is incapable of performing analysis on multiple frequencies at the same time. Enviro allows more flexibility in computation of audible noise and radio interference. For consistency BPA methods were used to produce results included in this report.

The electric fields, audible noise, and radio and television interference are all driven by the maximum operating voltage of conductors. Magnetic fields are driven by the line current loading, which varies over time, and not by the sub-conductor size or configuration. The magnetic fields calculations were performed at the maximum line loading and can be scaled down proportionally to the actual loading of the line.

The values of these effects are typically of concern at various points across the ROW. Therefore, values reported include the maximum and average values within the ROW for the given scenarios, along with the calculated values at the edge of the ROW. Also included for reference are plots of the results for all analyzed values across the entire width of the ROW and slightly beyond the ROW. Since this project will be constructed near sensitive sites, plots are also included showing the values extending approximately 5 miles to either side of the corridor.

For the analysis, electric and magnetic fields were analyzed at a minimum conductor height (mid-span, maximum sag), as this location will produce the worst case scenario. Audible noise, radio interference, and television interference were analyzed at the average conductor height along a span, as these effects are generally a concern over a larger area, and not immediately under the mid-span of the line.

Once values are calculated, they can be compared to local, statewide, or national guidelines and/or limits. However, no requirements were presented that would apply to this specific installation. Therefore, typical guidelines are presented for reference at this point. If specific limits for the WSMR or other regulatory agencies are presented at a later time, they can be examined and referenced in future versions of this report.

The two states involved in this project do not have any limits on electric or magnetic fields. However, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) publishes recommended limits (called reference limits) for electric and magnetic fields based on a collaboration of international scientists. The guidelines are non-binding and are more stringent than the guidelines presented by the Institute of Electrical and Electronics Engineers (IEEE). These values are expressed as reference exposure limits for both occupational and general public exposure. These limits are discussed in the results sections.

Nationally and in these states, audible noise from a transmission line has no regulated limit. However, the Environmental Protection Agency (EPA) provides a recommended limit of 55 dBA for outdoors for a day-night average sound level. Radio and television interference is driven by the signal-to-noise ratio, which depends on the broadcast source and frequencies. Some typical guidelines are discussed in the results section.

## 4.0 RESULTS OF VARIOUS CONDUCTOR CONFIGURATIONS

This section covers the examination of the various sub-conductor bundle configurations, as well as the alternate delta structure design. Typically, increasing the size or number of conductors will increase the electric field, have no effect on magnetic field, and will reduce the audible noise, radio interference, and television interference levels.

### 4.1 Electric Field

The electric field strength is a measure of the force per unit charge at a given point in space relative to a charged object. It is typically measured in kilovolts per meter (kV/m). Table 1 shows a summary of the values in the ROW for each configuration for a single transmission line. Values are calculated at the minimum conductor height (mid-span) at a height of one meter above the ground per IEEE Standard 644-1994 (R2008).

CASE	EDGE OF ROW	MAXIMUM IN ROW	AVERAGE IN ROW*
Horizontal 3-Bundle Lapwing	2.6	8.6	6.2
Horizontal 4-Bundle Rail	2.8	9.2	6.6
Horizontal 4-Bundle Lapwing	2.8	9.3	6.7
Delta 3-Bundle Lapwing	1.1	8.3	4.5

\* Average values based on data points calculated every five feet across the ROW width.

ICNIRP reference levels for electric field strength are 8.33 kV/m for occupational exposure and 4.16 kV/m for general public exposure. Values beyond the ROW are below the ICNIRP reference level for general public exposure.

Figure 1 and Figure 2 (on the following page) respectively show plots of the electric field across the ROW and for five miles beyond the ROW for the various configurations. The red line indicates the ICNIRP reference level for the general public (beyond the ROW) as a reference. Increasing the size or number of conductors will increase the maximum electric fields, while using a delta configuration will reduce the electric fields. Once more than a few hundred feet from the edge of the ROW, the values will be practically zero.

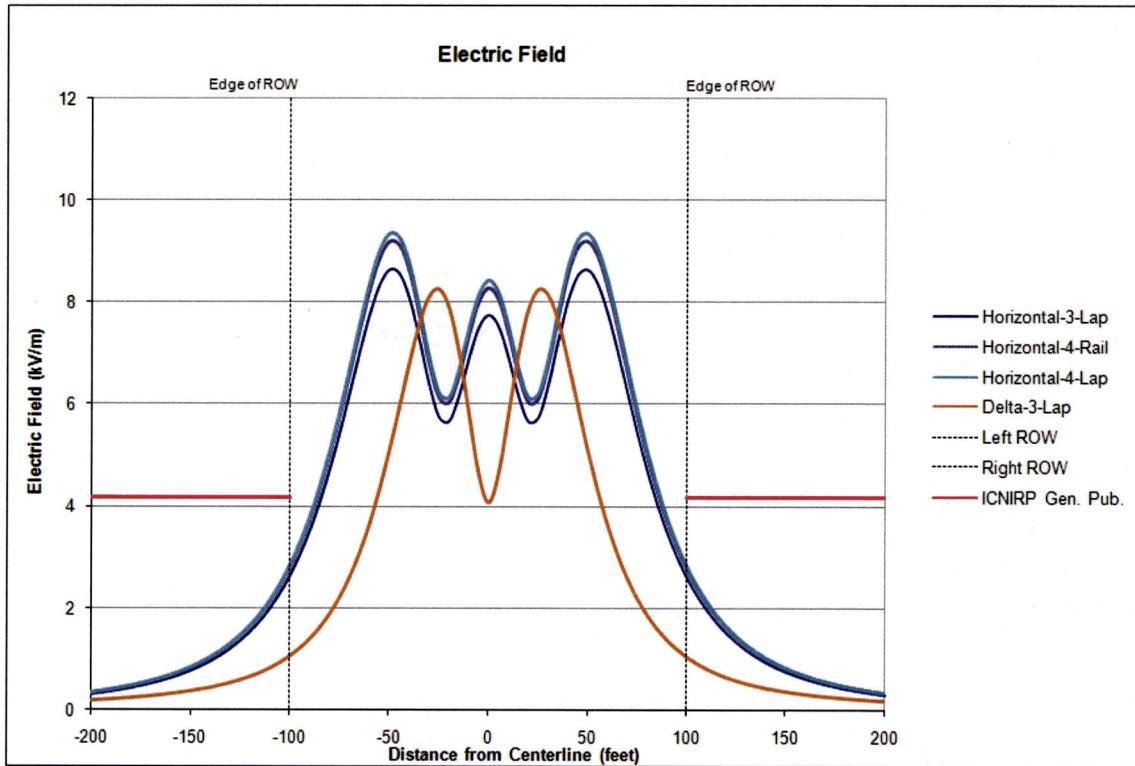


Figure 1: Electric Field Across ROW for Various Configurations

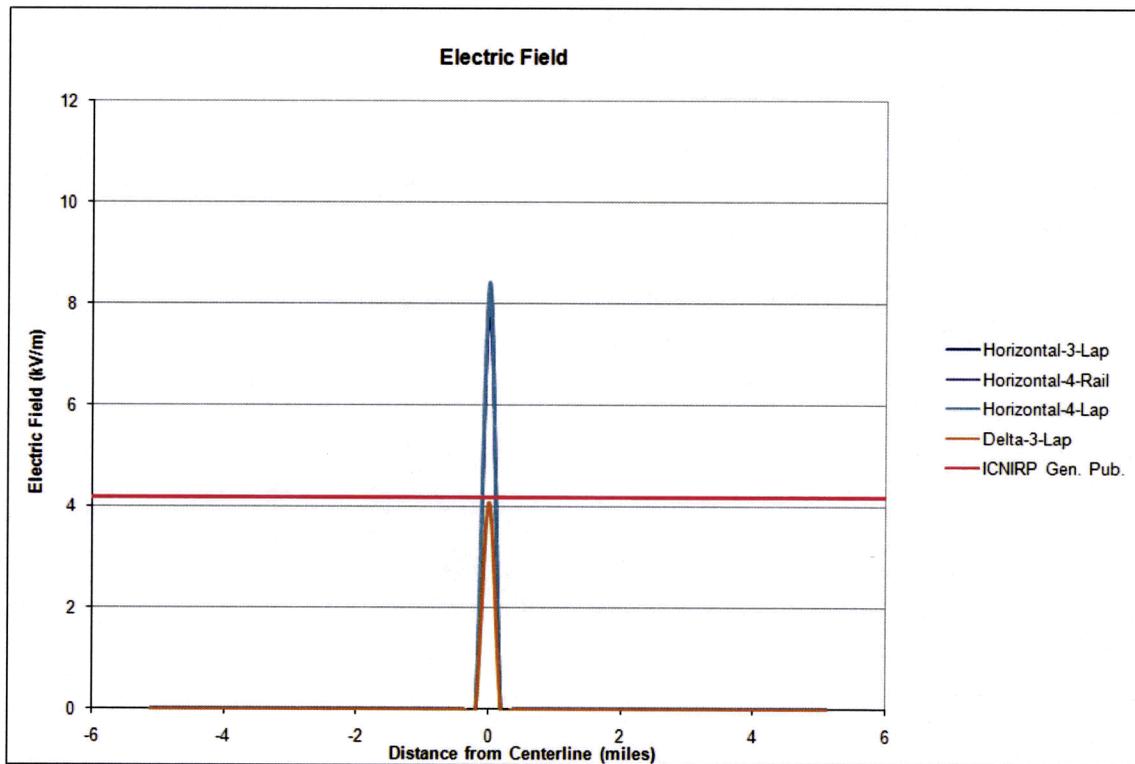


Figure 2: Electric Field for Five Miles Beyond ROW for Various Configurations

## 4.2 Magnetic Field

The reported magnetic field values are the magnetic flux density at a given point in space. Magnetic flux density is measured in gauss or milligauss (mG) or in micro-Teslas ( $\mu\text{T}$ ). These values can be easily converted as one tesla equals 10,000 gauss, or simply 10 mG equals 1  $\mu\text{T}$ .

Table 2 shows a summary of the resulting values in the ROW for each configuration for a single transmission line, assuming maximum current loading. All values are calculated assuming balanced loading on all three phases. The magnetic fields will vary if there is unbalance on the system; however, transmission unbalance is typically fairly low. Note that the results are directly proportional to the loading of the line; therefore, 50% loading would be exactly half of the 100% loading condition. Also note that the values are independent of the sub-conductor size. Values are calculated at the minimum conductor height (mid-span) at a height of one meter above the ground per IEEE Standard 644-1994 (R2008).

**Table 2: Magnetic Field Results for Various Configurations – 100% Loading [mG]**

CASE	EDGE OF ROW	MAXIMUM IN ROW	AVERAGE IN ROW*
Horizontal 3-Bundle Lapwing	89.4	294.5	217.5
Horizontal 4-Bundle Rail	89.4	294.5	217.5
Horizontal 4-Bundle Lapwing	89.4	294.5	217.5
Delta 3-Bundle Lapwing	41.0	265.3	141.3

\* Average values are based on data points calculated every five feet across the ROW width.

ICNIRP reference levels for magnetic flux density are 4,167 mG for occupational exposure and 833 mG for general public exposure. None of the configurations in this analysis exceed the ICNIRP limits for general public exposure. The ICNIRP reference level for general public (beyond the ROW) is also included in the associated plots.

Figure 3 and Figure 4 (on the following page) respectively show a plot of the magnetic field at 100% loading across the ROW and extending five miles beyond the ROW, for the two structure configurations. Again, since the magnetic field is directly proportional to the line current loading, values at 50% loading will follow the same plot shape but will be 50% of the magnitude.

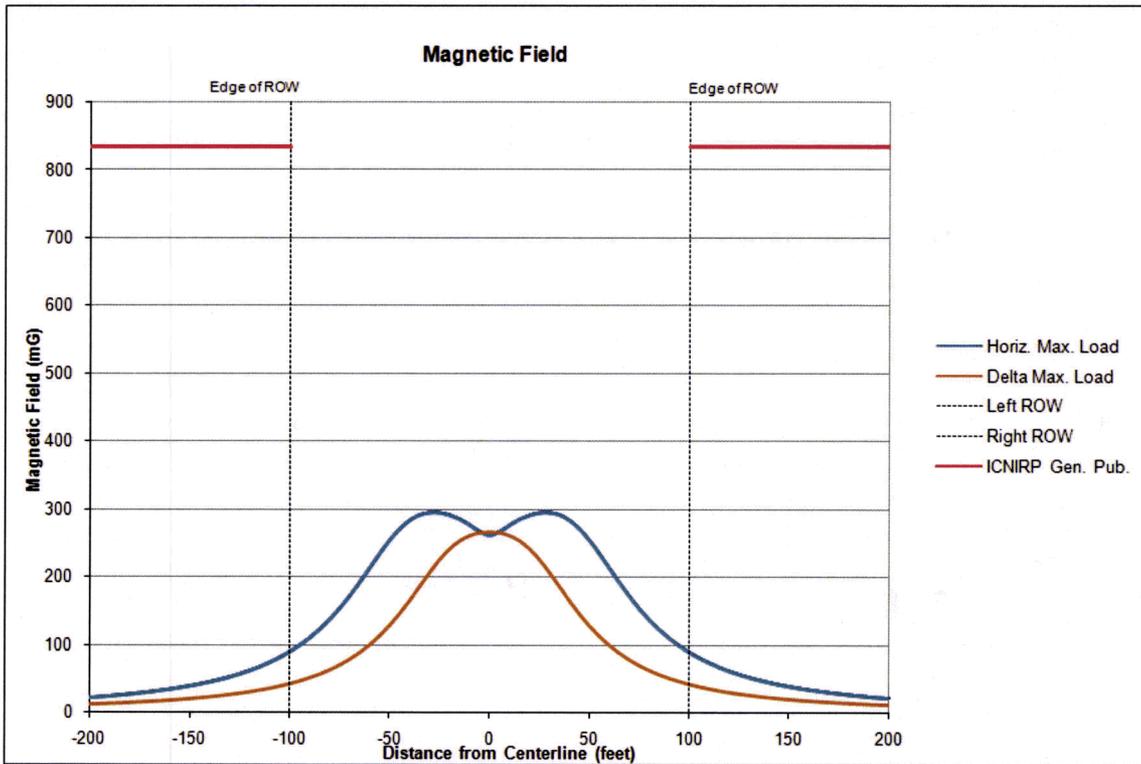


Figure 3: Magnetic Field Across ROW for Various Configurations

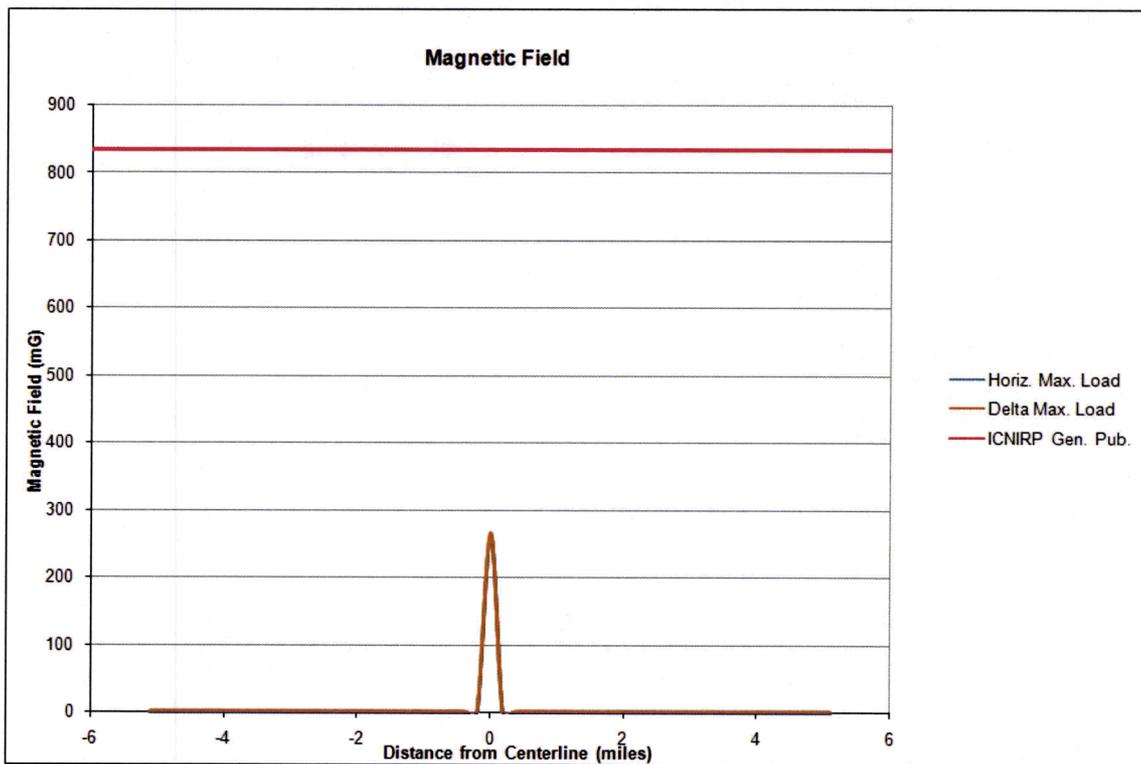


Figure 4: Magnetic Field for Five Miles Beyond ROW for Various Configurations

### 4.3 Audible Noise

Audible noise is measured as an equivalent A-weighted sound-pressure level in decibels (dBA). The  $L_{50}$  Audible Noise (Foul Weather) values represent a predicted average ( $L_{50}$ ) noise levels present when foul weather conditions cause the conductors to become wet. The actual value is expected to be at or below this calculated  $L_{50}$  value 50% of the time, and above the value the other 50% of the time. Values are calculated at a height of five feet above the ground per IEEE Standard 656-1992, using the average conductor height to approximate the average values along the entire line.

Table 3 shows a summary of the audible noise levels in the ROW for each configuration for a single transmission line.

**Table 3:  $L_{50}$  Audible Noise Results for Various Configurations (Foul Weather) [dBA]**

CASE	EDGE OF ROW	MAXIMUM IN ROW	AVERAGE IN ROW*
Horizontal 3-Bundle Lapwing	45.0	48.1	46.8
Horizontal 4-Bundle Rail	43.3	46.4	45.1
Horizontal 4-Bundle Lapwing	38.7	41.8	40.5
Delta 3-Bundle Lapwing	47.4	50.4	49.1

\* Average values based on data points calculated every five feet across the ROW width.

No guidance was provided on limits for audible noise for this line route; however, EPA guidelines recommend levels below 55 dBA for a day-night average in the outdoors. If applied to transmission lines, this is often measured at the edge of the ROW. The values across the entire ROW are all below this EPA recommendation for all configurations.

Figure 5 and Figure 6 (on the following page) respectively show a plot of the audible noise levels across the ROW and extending five miles beyond the ROW for a the various configurations. In addition, these figures show the EPA recommended level as a red line beyond the ROW.

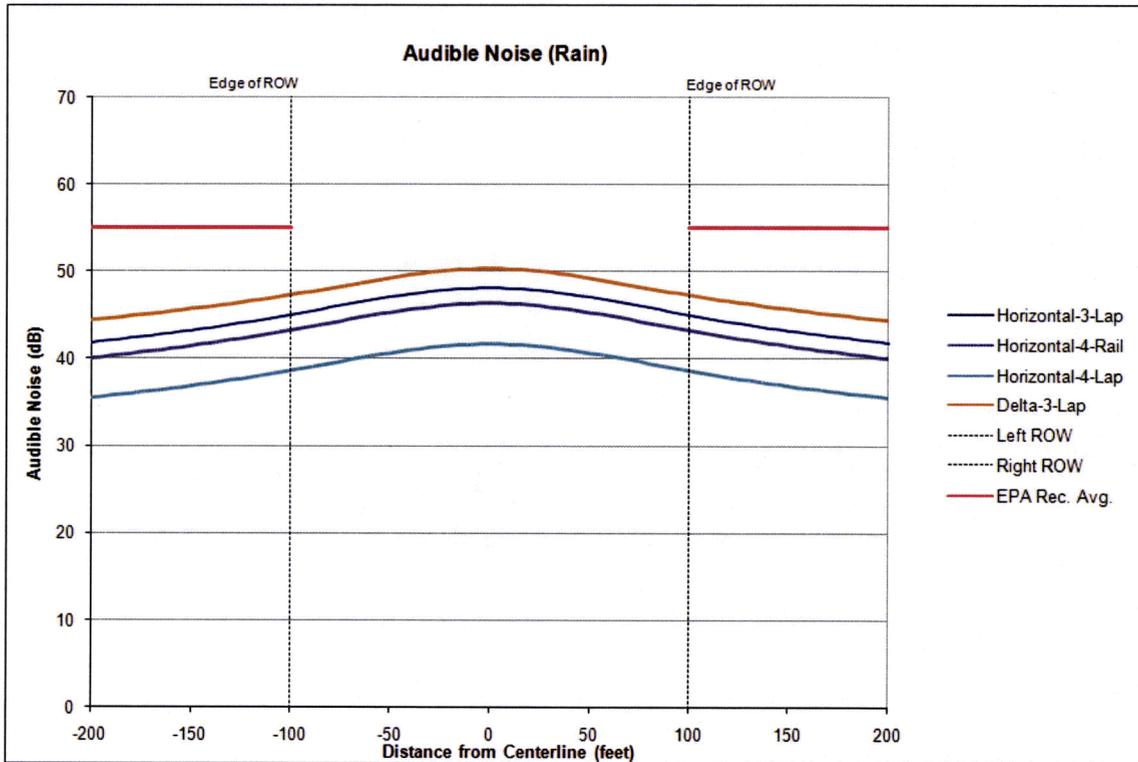


Figure 5: Audible Noise Across ROW for Various Configurations

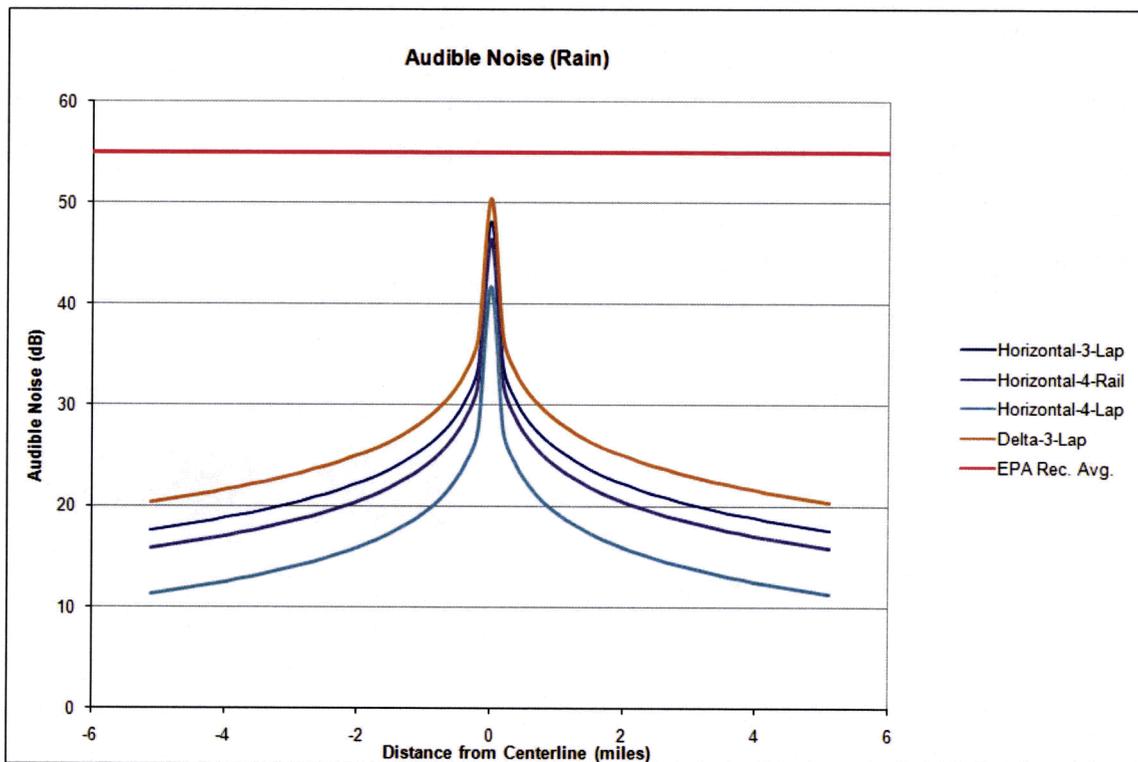


Figure 6: Audible Noise for Five Miles Beyond ROW for Various Configurations

#### 4.4 AM Radio Interference

Radio interference is the degradation of a radio signal by radio frequency electromagnetic disturbances and is reported as the field strength of the interference. It is often measured in decibels (dB) of one microvolt per meter ( $\mu\text{V}/\text{m}$ ), which is a logarithmic scale. The  $L_{50}$  Radio Interference (Fair Weather) values represent the predicted average levels present when conductors are dry. Note that interference values will increase during foul weather conditions; however, other atmospheric conditions will typically have a greater degradation of AM radio signals during this scenario.

The actual value of radio interference is expected to be at or below this calculated  $L_{50}$  value 50% of the time, and above the value the other 50% of the time. Values are calculated at a height of six feet above the ground and at 1 MHz, using the average conductor height to approximate the average values along the entire line. IEEE Standard 430-1986 suggests that these measurements are taken no greater than two meters above the surface.

Radio frequency and television interference is also dependent on frequency. As the frequency of desired received signal goes up the interference produced by corona goes down. This effect is most prominent in frequencies above 1 MHz. Figure 7 below (Figure 8.5-2 from the EPRI AC Transmission Line Reference Book, Third Edition) shows the magnitude of the corona decreasing as frequency goes up. As the magnitude of the corona decreases the radio interference effects diminish as well.

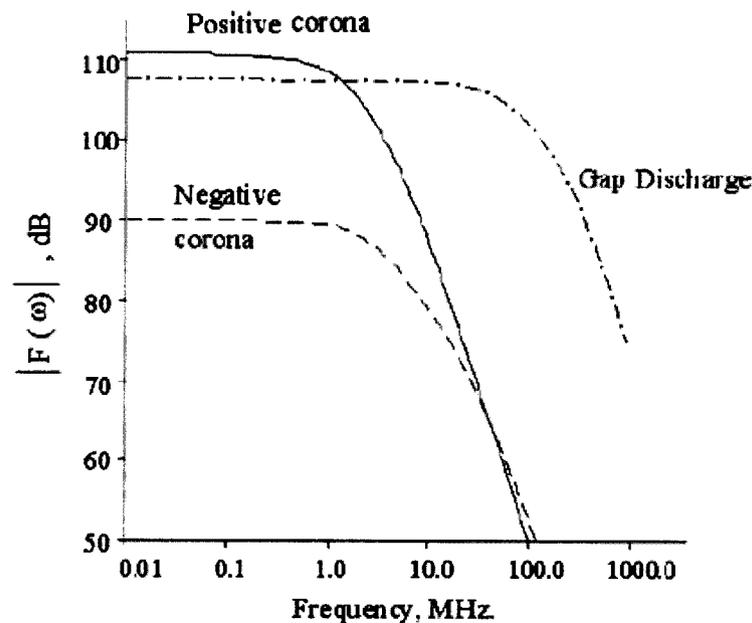


Figure 7: Corona Effects with Increasing Frequency

Radio interference is affected by both the signal strength, as well as the level of interference (noise). The signal-to-noise ratio (SNR) is simply the signal strength in dB minus the calculated interference (noise) level in dB. Depending on location, the signal strength can vary significantly; therefore the amount of interference that is tolerable varies as well. Guidance provided by the EPRI AC Transmission Line Reference Book indicates that the amount of radio interference should be below 38 dB at 100 feet from the outermost conductor (or often examined at the edge of ROW). This is only a rough guideline, and without actual signal strength measurements and data from the FCC on the protected signal contours (within which the signals are protected from interference) for radio stations in the area, can only provide a typical idea of if there may be concerns.

Table 4 shows a summary of the radio interference levels in the ROW for each configuration.

<b>CASE</b>	<b>EDGE OF ROW</b>	<b>MAXIMUM IN ROW</b>	<b>AVERAGE IN ROW*</b>
Horizontal 3-Bundle Lapwing	37.5	47.7	43.2
Horizontal 4-Bundle Rail	34.5	44.8	40.3
Horizontal 4-Bundle Lapwing	28.2	38.6	34.0
Delta 3-Bundle Lapwing	38.6	47.8	44.3

\* Average values based on data points calculated every five feet across the ROW width.

Figure 8 and Figure 9 respectively show a plot of the radio interference levels across the ROW and extending five miles beyond the ROW for the various configurations. All configurations indicate values below the 38 dB recommendation at 100 feet from the outermost conductor, as can be seen in the following figures. In addition, all horizontal configurations are below the limit at the edge of ROW, as shown by the red line on the plots. However, as this is only a guideline, it is possible that some stations that have low signal strength in the area may suffer from some interference. Similarly, these values are calculated at 1 MHz and will decrease with increasing frequency, or increased separation between the line and antenna.

It is important to note that these values are based on a 1 MHz amplitude modulated signal. Most modern communications systems use either frequency modulation or spread spectrum techniques, and broadcast at higher frequencies. In addition, the signals are often digital which are typically more immune to interference. It is anticipated that most other communications signals would be able to function properly even with the effects of these transmission line interference results.

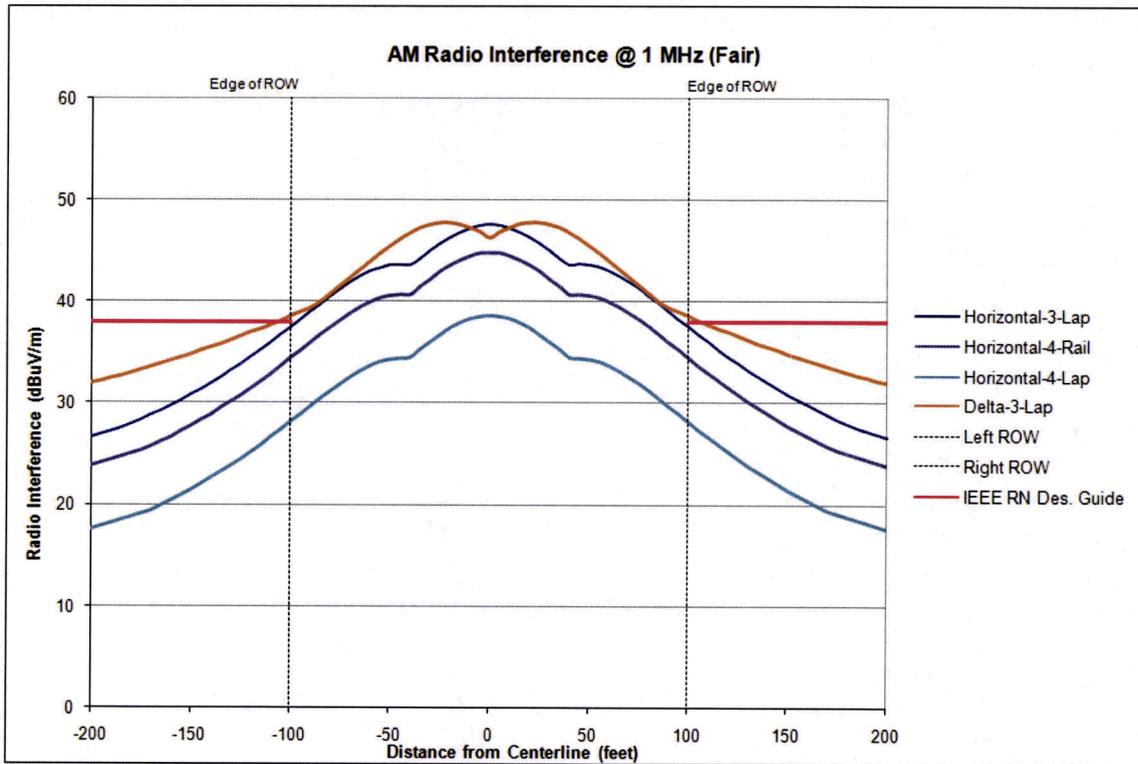


Figure 8: AM Radio Interference Across ROW for Various Configurations

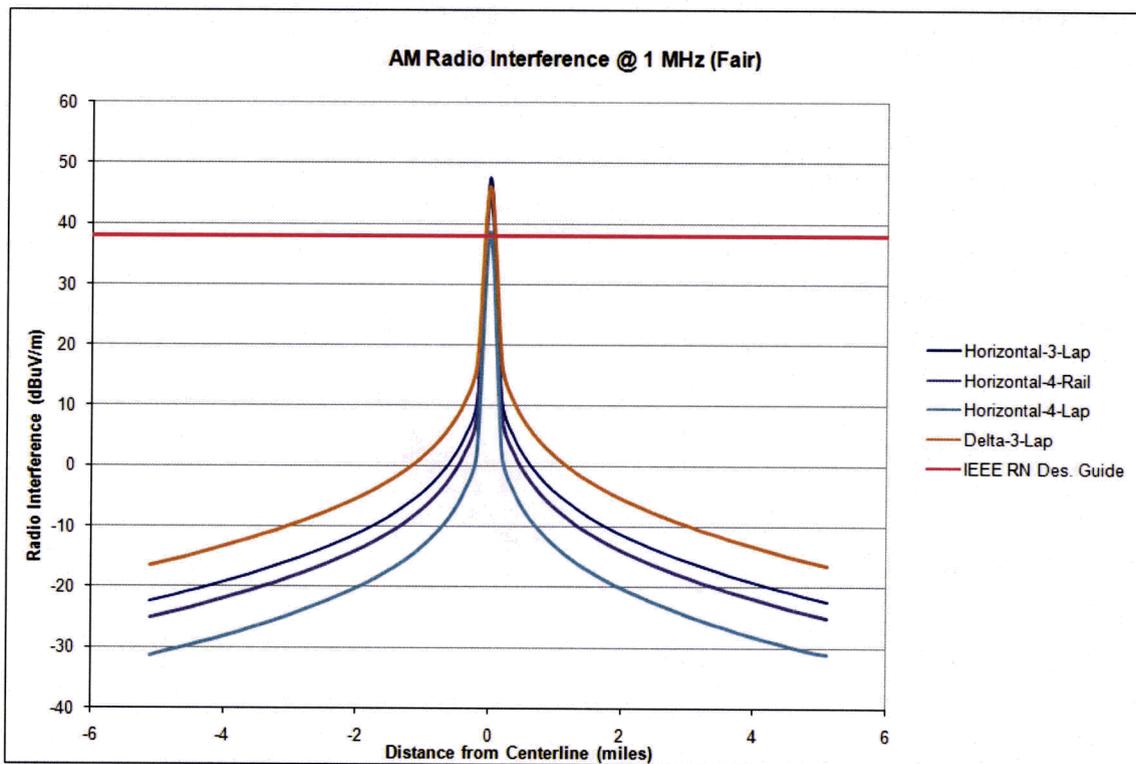


Figure 9: AM Radio Interference for Five Miles Beyond ROW for Various Configurations

#### 4.5 Television Interference

Television interference (TVI) is the degradation of a television signal by television frequency electromagnetic disturbances and is reported as the field strength of the interference. It is often measured in decibels (dB) of one microvolt per meter ( $\mu\text{V}/\text{m}$ ) which is a logarithmic scale. The values are reported for wet conductor conditions, as TVI is negligible during fair weather. Values are calculated at a height of ten meters above the ground per IEEE Standard 430-1986 and FCC measurement guidelines, using the average conductor height to approximate the average values along the entire line. Television signals cover multiple bands and a large range of frequencies. These calculations are made in a dead band (75 MHz) in the lower VHF band (54-88 MHz), and interference effects will decrease moving into the upper VHF (174-216 MHz) and the UHF (470-698 MHz) bands, which are the more commonly used bands.

Television interference is now less of a concern since the recent national switch to digital television. Digital television does not experience the typical TVI noise effects that analog television did, such as shadowing or snow. With digital television, there is either signal or no signal, and the signals are less susceptible to the noise due to their higher operating frequencies. However, the values are reported since there may be a few local low-strength analog stations broadcasting in the area, or for any remaining VHF digital channels on the fringe of their operating range.

There has also been no significant published research on what levels of transmission line corona TVI will cause disruption of digital television signals, therefore there are no guidelines, such as those that apply to analog television. However, the FCC has indicated that a signal-to-random noise ratio of 17 dB or greater should be sufficient for reception. Similar to radio interference, TVI needs both a signal strength and a calculated noise (interference) value to calculate a signal-to-noise ratio, which in turn would provide an idea of reception quality. Using the digital upper VHF (most stations have moved out of the lower VHF band) average signal strength for a channel of 36 dB and the signal-to-random noise ratio above, a rough limit could be approximated at 19 dB of TVI. Note that this limit is not an industry accepted limit and is only a means of rough guidance.

Table 5 shows a summary of the television interference levels in the ROW for each configuration for a single transmission line.

**Table 5: Television Interference for Various Configurations [dB $\mu\text{V}/\text{m}$  @ 75 MHz]**

CASE	EDGE OF ROW	MAXIMUM IN ROW	AVERAGE IN ROW*
Horizontal 3-Bundle Lapwing	18.3	30.4	24.7
Horizontal 4-Bundle Rail	15.2	27.6	21.7
Horizontal 4-Bundle Lapwing	8.9	21.4	15.4
Delta 3-Bundle Lapwing	19.4	30.5	25.7

\* Average values based on data points calculated every five feet across the ROW width.

Figure 10 and Figure 11 (on the following page) respectively show a plot of the television interference levels across the ROW and extending five miles beyond the ROW for each of the configurations. The rough guideline mentioned above is indicated by a red line beyond the ROW on these plots.

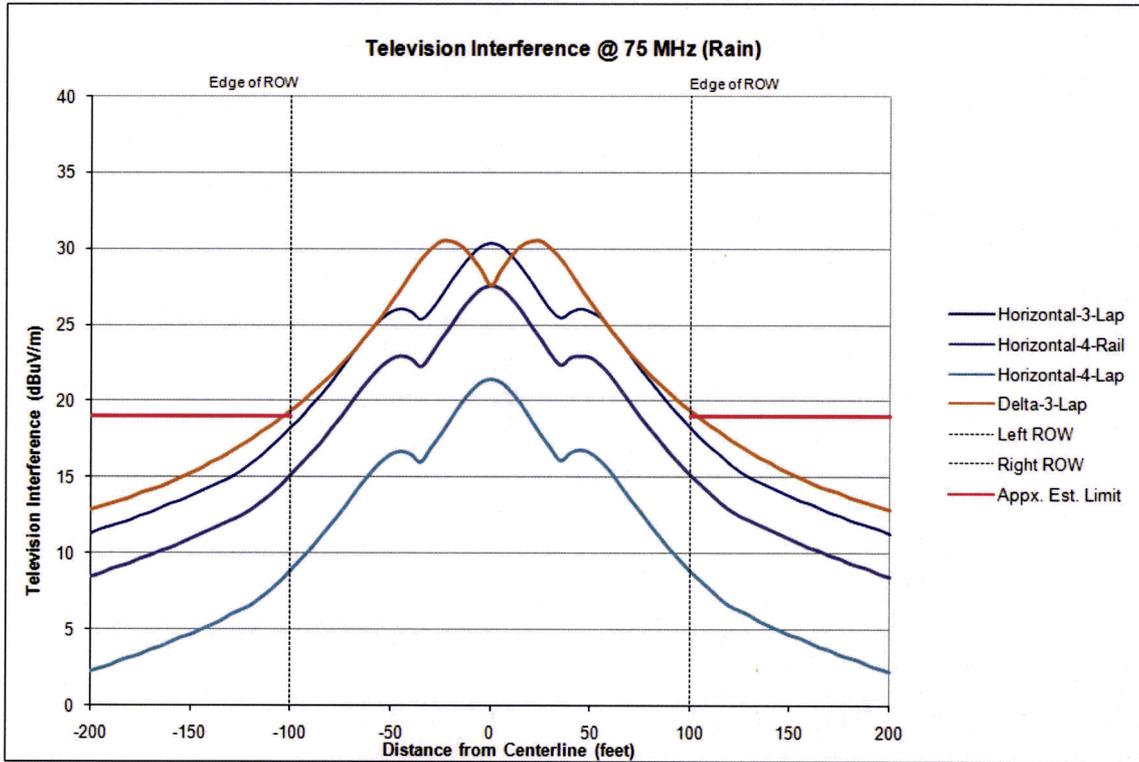


Figure 10: Television Interference Across ROW for Various Configurations

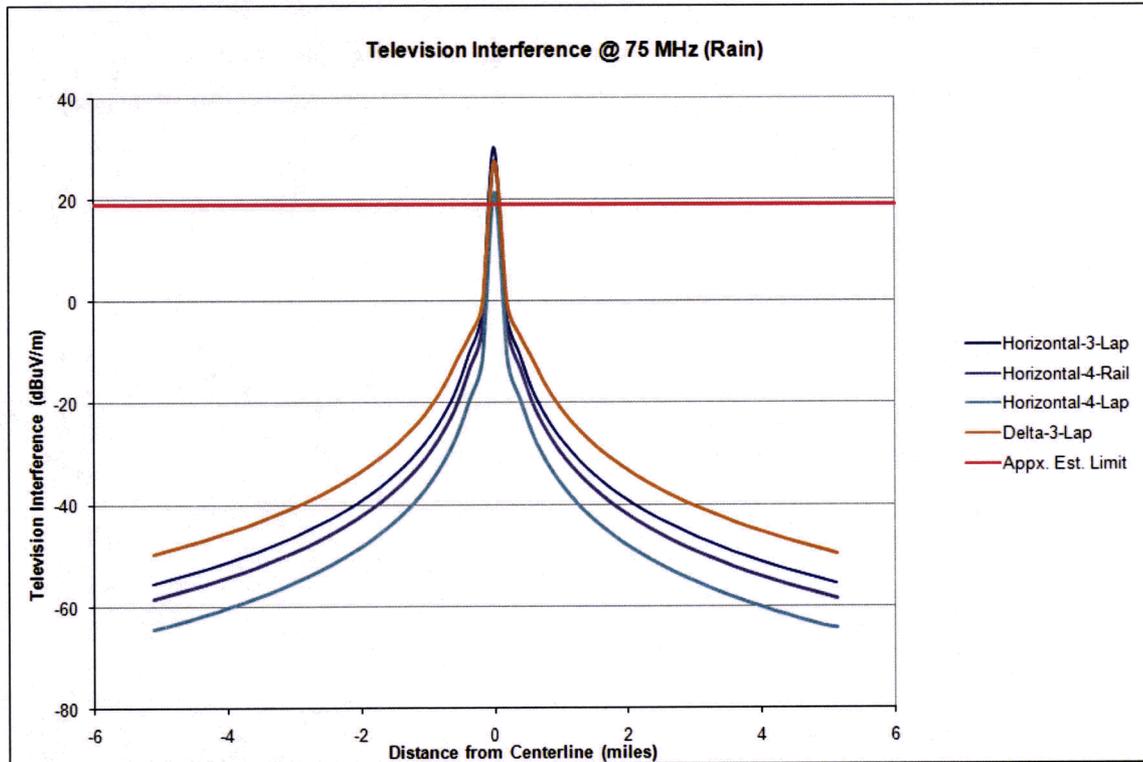


Figure 11: Television Interference for Five Miles Beyond ROW for Various Configurations

## 5.0 RESULTS OF INCREASING LINE VOLTAGE

This section explores the effects of increasing line voltage along the AC line. Since this transmission line will be heavily compensated with reactive power, there is a high likelihood that portions of the line will far exceed the nominal 500 kV rating. All calculations in Section 4 were based on 105% of the nominal voltage. This section extends to 110%, 115%, and 120% of nominal voltage. Increasing the voltage increases the electric field, which in turn increases the audible noise, radio interference, and television interference. Magnetic fields are driven by current and therefore are not directly affected by the system voltage.

All cases examined in this section are based on the initial design of a three conductor bundle using 1590 ACSR Lapwing conductor in a horizontal configuration. These results can be interpolated into the results of the other configurations presented in Section 4.

### 5.1 Electric Field

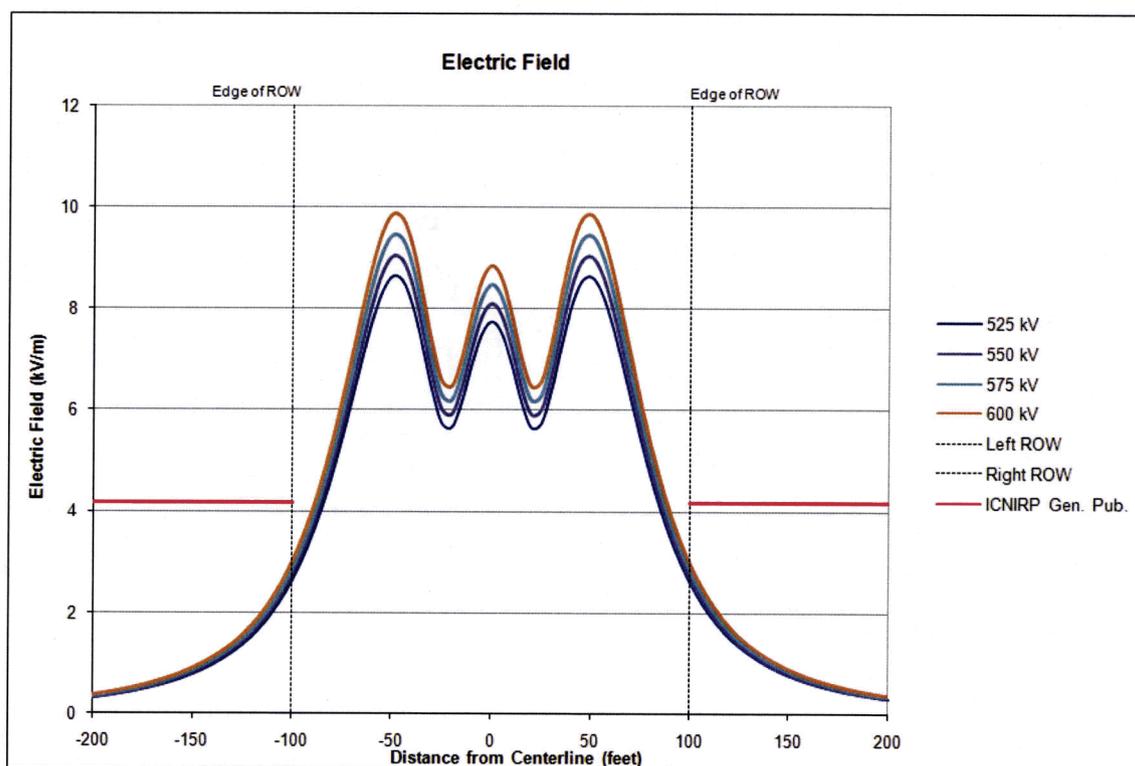
Electric fields are directly proportional to the voltage. Therefore when the voltage goes up 5%, so does the resulting electric field. Table 6 presents the increased electric fields based on the four examined scenarios.

**Table 6: Electric Field Results for Different Voltages [kV/m]**

CASE	EDGE OF ROW	MAXIMUM IN ROW	AVERAGE IN ROW*
Max. Voltage = 105% (525 kV)	2.6	8.6	6.2
Max. Voltage = 110% (550 kV)	2.7	9.0	6.5
Max. Voltage = 115% (575 kV)	2.9	9.5	6.8
Max. Voltage = 120% (600 kV)	3.0	9.9	7.1

\* Average values based on data points calculated every five feet across the ROW width.

Figure 12 shows a plot of the electric field across the ROW for the various voltages. Again, none of these changes result in exceeding the ICNIRP reference level beyond the edge of the ROW, which is shown as a red line on the plot. Since the values drop to nearly the same value just beyond the edge of the ROW, no plot to five miles was provided as the fields are negligible as before.



**Figure 12: Electric Field Across ROW for Different Voltages**

## 5.2 Magnetic Field

The magnetic field is independent of the system voltage and therefore is not presented in this section.

### 5.3 Audible Noise

Table 7 shows a summary of the audible noise levels in the ROW as the voltage increases for a single transmission line. The increases in noise are roughly proportional to the increase in voltage.

Table 7: L50 Audible Noise Results for Different Voltages (Foul Weather) [dBA]			
CASE	EDGE OF ROW	MAXIMUM IN ROW	AVERAGE IN ROW*
Max. Voltage = 105% (525 kV)	45.0	48.1	46.8
Max. Voltage = 110% (550 kV)	47.4	50.5	49.3
Max. Voltage = 115% (575 kV)	49.8	52.8	51.6
Max. Voltage = 120% (600 kV)	52.0	55.0	53.8

\* Average values based on data points calculated every five feet across the ROW width.

Figure 13 shows a plot of the audible noise levels across the ROW for increasing voltages. The EPA recommended average noise level shown as a red line on the plot) is not exceeded within or beyond the ROW for any of these scenarios.

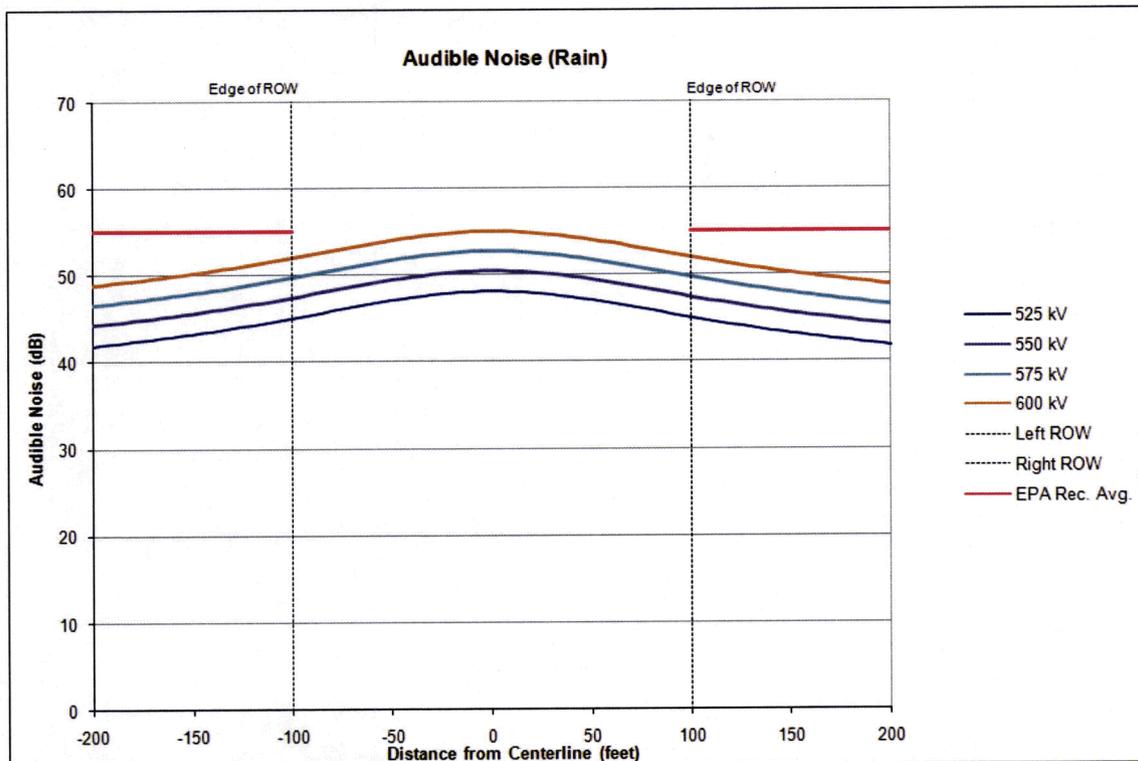


Figure 13: Audible Noise Across ROW for Different Voltages

## 5.4 AM Radio Interference

Table 8 shows a summary of the radio interference levels in the ROW for the increasing voltages. Again, values increase roughly proportional to the increase in voltage.

Table 8: L50 Radio Interference for Different Voltages (Fair Weather) [dB $\mu$ V/m @ 1MHz]			
CASE	EDGE OF ROW	MAXIMUM IN ROW	AVERAGE IN ROW*
Max. Voltage = 105% (525 kV)	37.5	47.7	43.2
Max. Voltage = 110% (550 kV)	40.0	50.1	45.7
Max. Voltage = 115% (575 kV)	42.3	52.4	48.0
Max. Voltage = 120% (600 kV)	44.5	54.6	50.2

\* Average values based on data points calculated every five feet across the ROW width.

Figure 14 shows a plot of the radio interference levels across the ROW for the various voltages. Near the higher voltages, the IEEE Radio Noise Design Guide recommended limit of 38 dB (shown as a red line) is slightly exceeded, but this is only for antennas located within about 50 feet of the edge of ROW.

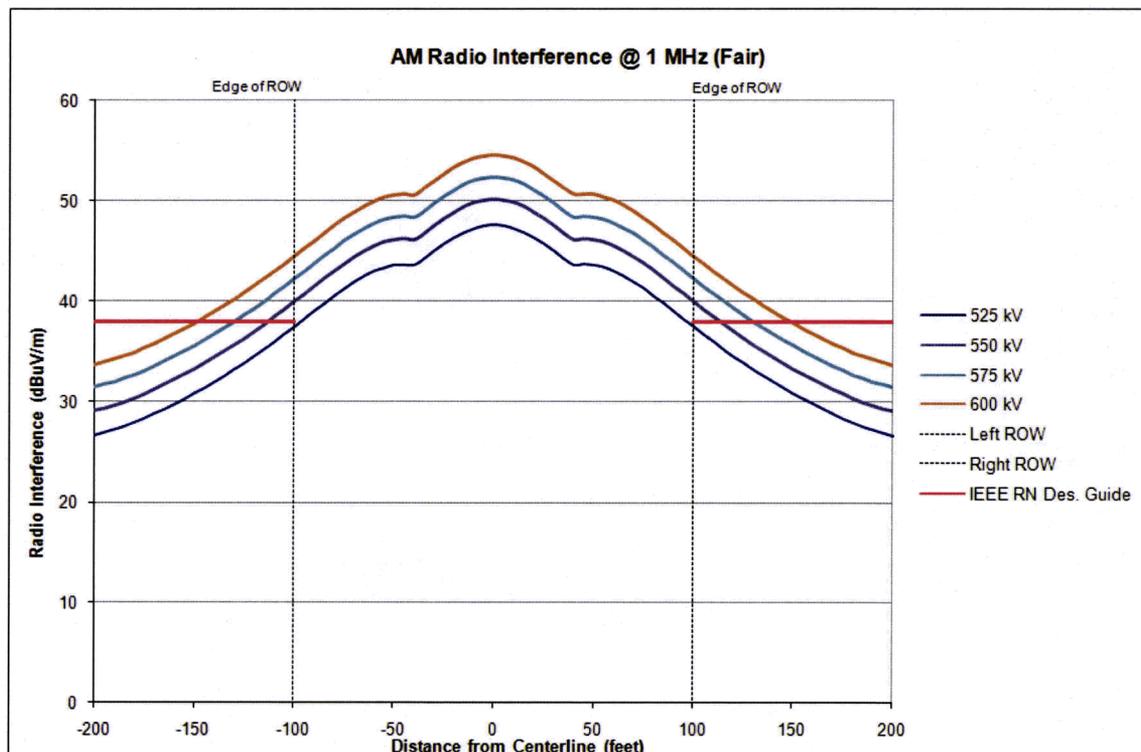


Figure 14: AM Radio Interference Across ROW for Different Voltages

## 5.5 Television Interference

Table 9 shows a summary of the television interference levels in the ROW for each configuration for a single transmission line. As with the other effects, TVI increases roughly proportional to the voltage.

Table 9: Television Interference for Different Voltages [dB $\mu$ V/m @ 75 MHz]			
CASE	EDGE OF ROW	MAXIMUM IN ROW	AVERAGE IN ROW*
Max. Voltage = 105% (525 kV)	18.3	30.4	24.7
Max. Voltage = 110% (550 kV)	20.7	32.8	27.1
Max. Voltage = 115% (575 kV)	23.0	35.2	29.4
Max. Voltage = 120% (600 kV)	25.2	37.4	31.6

\* Average values based on data points calculated every five feet across the ROW width.

Figure 15 shows a plot of the television interference levels across the ROW for each of the voltage scenarios.

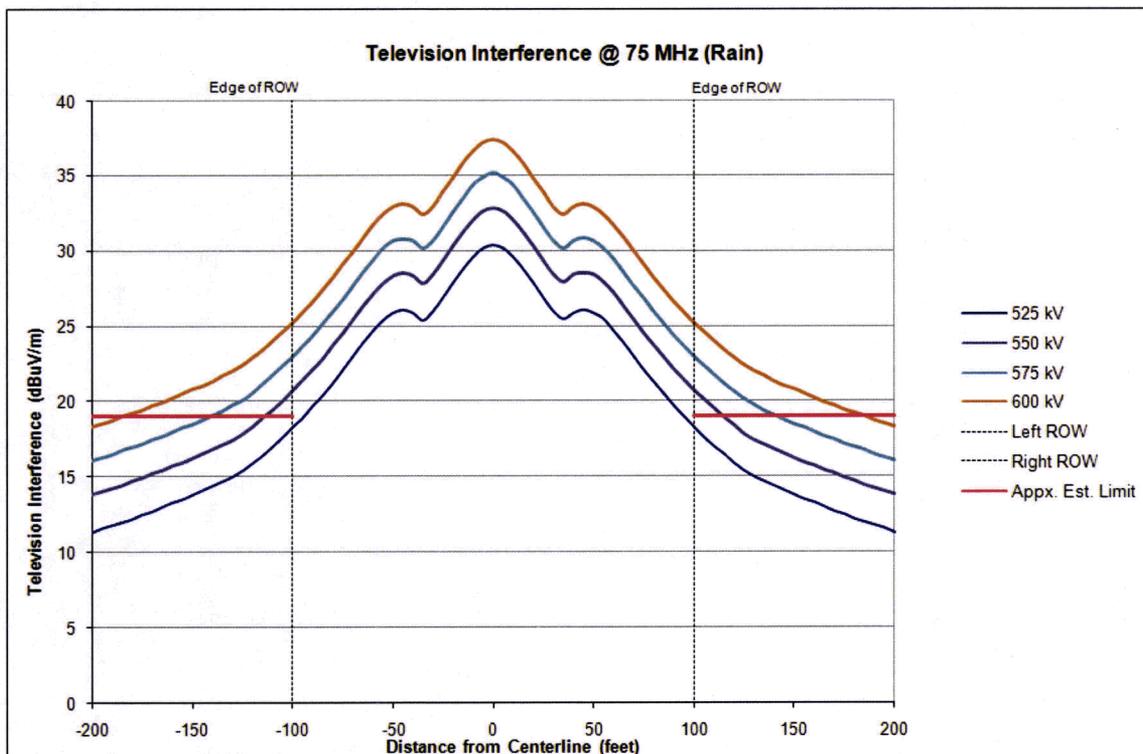


Figure 15: Television Interference Across ROW for Different Voltages

## 6.0 RESULTS OF ADDING A SECOND LINE

This section examines the effects of adding a second AC or DC line in parallel to the first. In addition, two phasing configurations are examined for the AC cases, the first with the phases A-B-C and A-B-C left-to-right on the two structures, the second with A-B-C and C-B-A. For some aspects one arrangement will present a slightly better configuration, and for others the opposite arrangement will be slightly better.

In general with a second AC line, values at and near the edge of ROW remain similar to that of one line, especially when examining the audible noise and radio and television interference. Values near the center of the ROW differ particularly for the electric and magnetic fields. For cases where the second line is DC, none of the values at the edge of the ROW are significantly higher. The maximum electric and magnetic fields and RI effects in the ROW are higher with DC versus AC, while the audible noise is actually lower. Once far from the line, the values are practically identical for all effects.

All cases examined in this section are based on the initial design of a three conductor bundle using 1590 ACSR Lapwing conductor in a horizontal configuration. These results can be interpolated into the results of the other AC configurations presented in Section 4.

### 6.1 Electric Field

Table 10 shows a summary of the values in the ROW for different configurations with two transmission lines in the corridor. These values are similar to the single line cases, although the DC values peak higher in the ROW.

<b>Table 10: Electric Field Results for Two Circuits [kV/m]</b>			
<b>CASE</b>	<b>EDGE OF ROW</b>	<b>MAXIMUM IN ROW</b>	<b>AVERAGE IN ROW*</b>
Second Line with A-B-C and A-B-C Phasing (L to R)	2.7	8.7	4.7
Second Line with A-B-C and C-B-A Phasing (L to R)	2.6	9.1	5.3
AC-DC Hybrid	2.6	12.0	6.8

\* Average values based on data points calculated every ten feet across the ROW width.

Figure 16 shows a plot of the electric field across the ROW for the configurations. Due to the arrangement of the phase conductors, the A-B-C A-B-C configuration presents a cancelation effect, reducing the electric maximum field strength near the center of the ROW. The DC line brings up the field strength on its side of the corridor due to larger phase-to-neutral voltages associated with it. Ion enhanced fields were not considered in the electric field strength of the hybrid line. This is a phenomenon where static pole conductors can actually charge the air particles in the immediate vicinity in fair low wind conditions and could cause field strengths higher than reported. These enhanced fields vary significantly

with weather conditions, and are hard to predict. Other reported values do take these effects into account due to the use of empirical formulas.

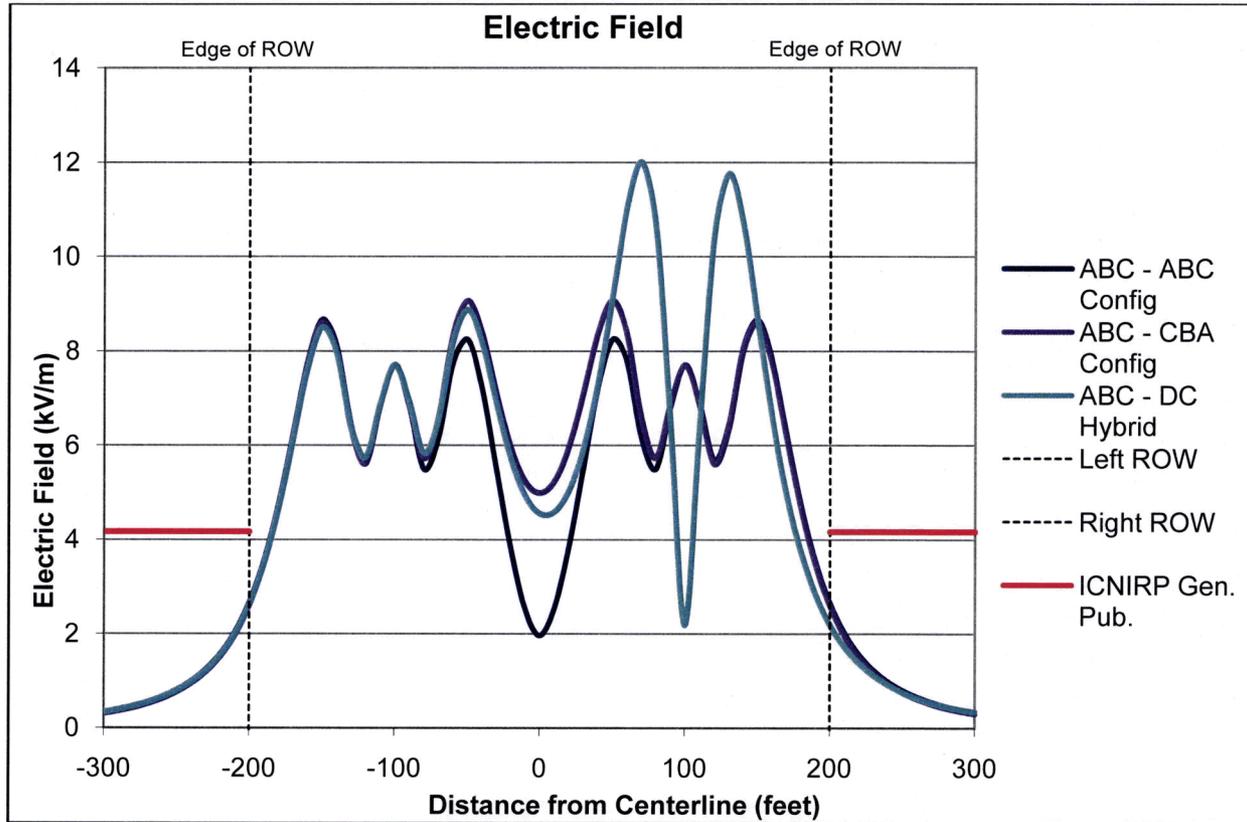


Figure 16: Electric Field Across ROW for Two Circuits

### 6.2 Magnetic Field

Table 11 shows a summary of the values in the ROW for the different configurations with two transmission lines in the corridor assuming maximum current loading. Again, the results are directly proportional to the loading of the line; therefore, 50% loading would be exactly half of the 100% loading condition. The values presented are similar to a single line case at the edge of ROW.

Table 11: Magnetic Field Results for Two Circuits – 100% Loading [mG]			
CASE	EDGE OF ROW	MAXIMUM IN ROW	AVERAGE IN ROW*
Second Line with A-B-C and A-B-C Phasing (L to R)	97.4	284.9	171.4
Second Line with A-B-C and C-B-A Phasing (L to R)	82.1	323.2	188.0
AC – DC Hybrid	102.5	496.6	272.8

\* Average values are based on data points calculated every ten feet across the ROW width.

Figure 17 shows a plot of the magnetic field across the ROW at 100% loading for the various configurations. Similar to the electric field, the A-B-C A-B-C configuration presents a cancellation effect near the center of the ROW, although the values near the edge of the ROW and beyond are actually lower with the A-B-C C-B-A configuration. However, the AC – DC hybrid corridor has much higher peak magnetic fields in the ROW due to the fact that the DC has approximately twice the current of the AC line.

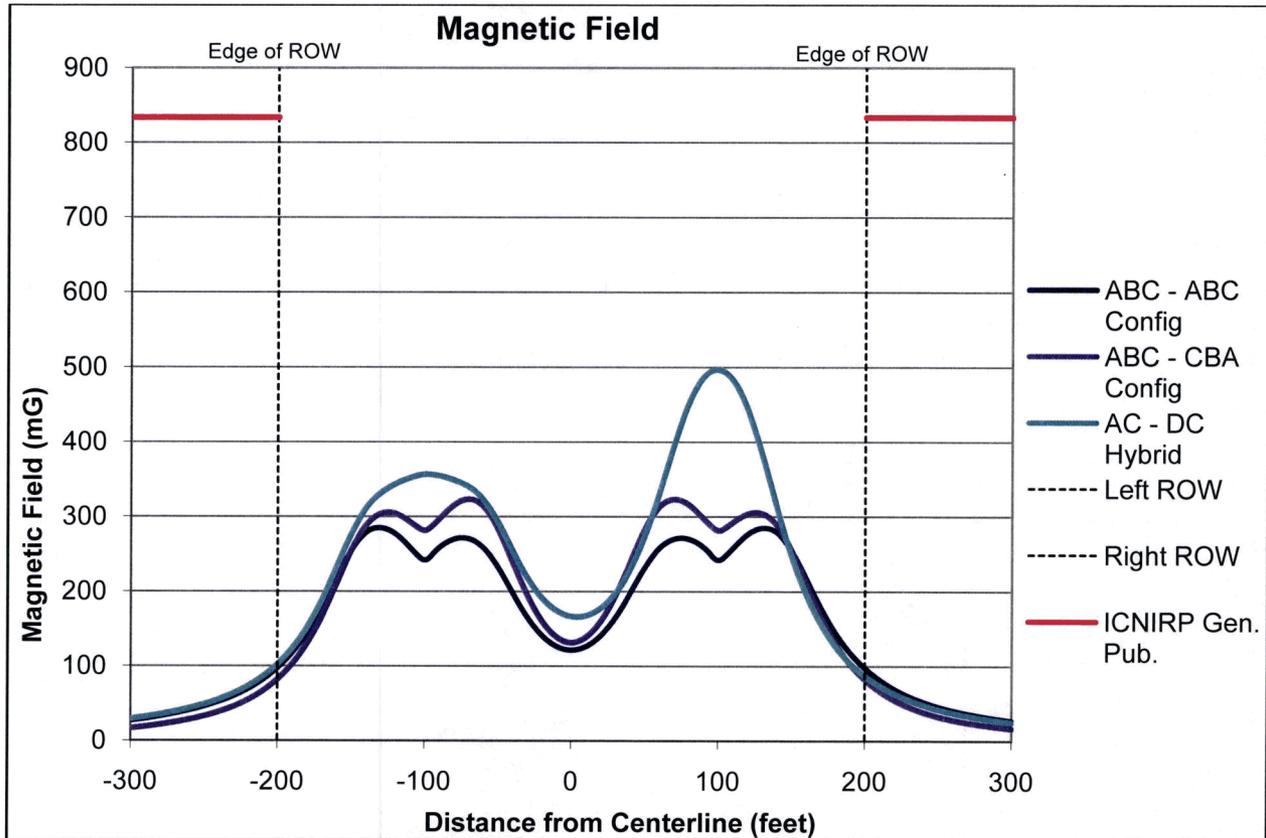


Figure 17: Magnetic Field Across ROW for Two Circuits

### 6.3 Audible Noise

Table 12 shows a summary of the values in the ROW for the different line configurations with two transmission lines in the corridor. These values are approximately equal to those of a single line for foul weather conditions.

Table 12: L50 Audible Noise Results for Two Circuits (Foul Weather for AC) [dBA]			
CASE	EDGE OF ROW	MAXIMUM IN ROW	AVERAGE IN ROW*
Second Line with A-B-C and A-B-C Phasing (L to R)	46.4	49.3	47.7
Second Line with A-B-C and C-B-A Phasing (L to R)	46.1	48.9	47.2
AC-DC Hybrid (Foul)	46.0	48.8	46.3
AC-DC Hybrid (Fair)	37.2	41.3	38.5

\* Average values based on data points calculated every ten feet across the ROW width.

Figure 18 shows a plot of the audible noise levels across the ROW for the various configurations. There is negligible difference between the configurations in areas of close proximity to the AC transmission lines. The DC transmission line is actually noisier during fair weather which is why it is included. However, the noise from the foul weather AC transmission line is greater than that of the fair weather DC line for both weather conditions and all values are below the EPA guidelines.

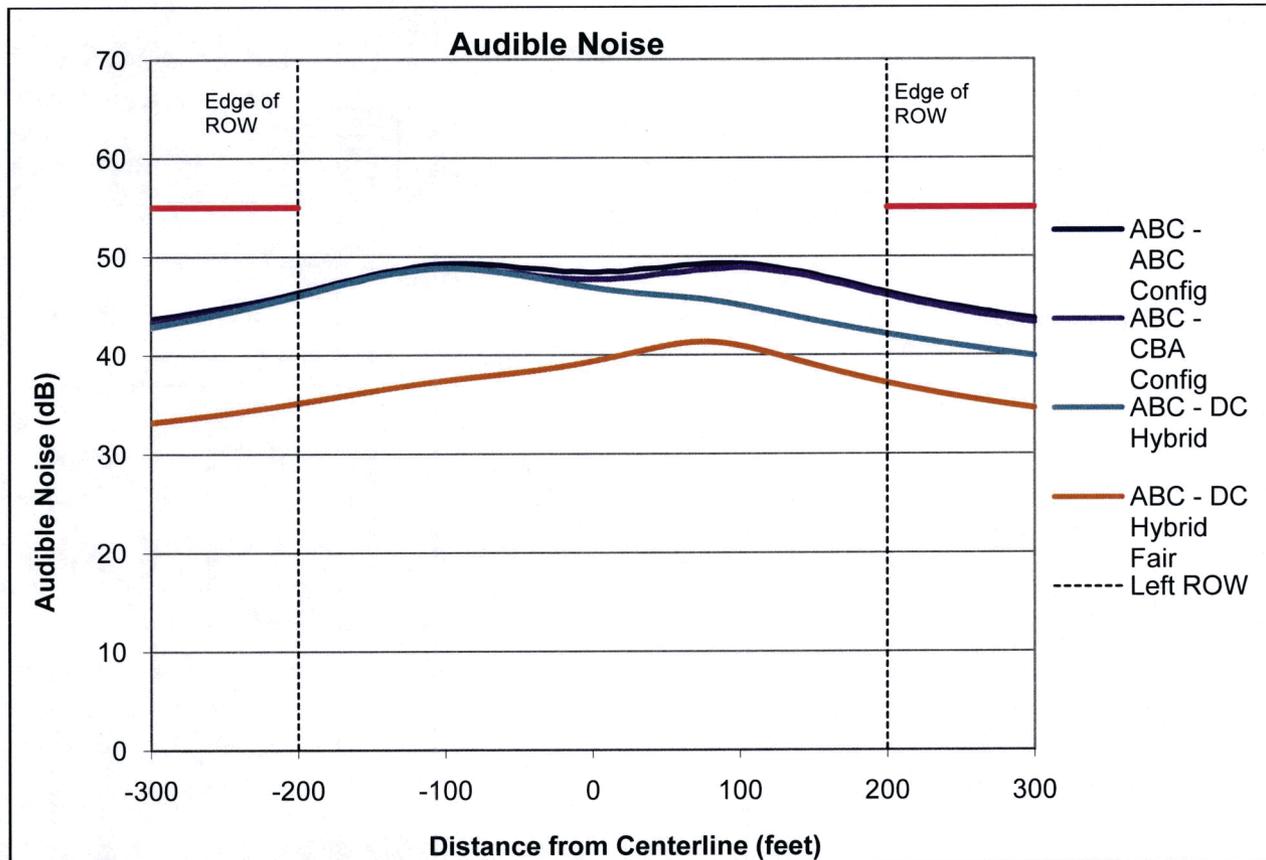


Figure 18: Audible Noise Across ROW for Two Circuits

### 6.4 AM Radio Interference

Table 13 shows a summary of the values in the ROW with two transmission lines in the corridor. These values are nearly identical to the single transmission line case at the edge of ROW.

Table 13: L50 Radio Interference for Two Circuits (Fair Weather) [dB $\mu$ V/m @ 1MHz]			
CASE	EDGE OF ROW	MAXIMUM IN ROW	AVERAGE IN ROW*
Second Line with A-B-C and A-B-C Phasing (L to R)	37.3	47.8	40.6
Second Line with A-B-C and C-B-A Phasing (L to R)	37.6	47.8	40.0
AC-DC Hybrid	38.1	50.0	41.6

\* Average values based on data points calculated every ten feet across the ROW width.

Figure 19 shows a plot of the radio interference levels across the ROW for the various configurations. The values of the under the DC line increase slightly, but there is little change outside of the ROW.

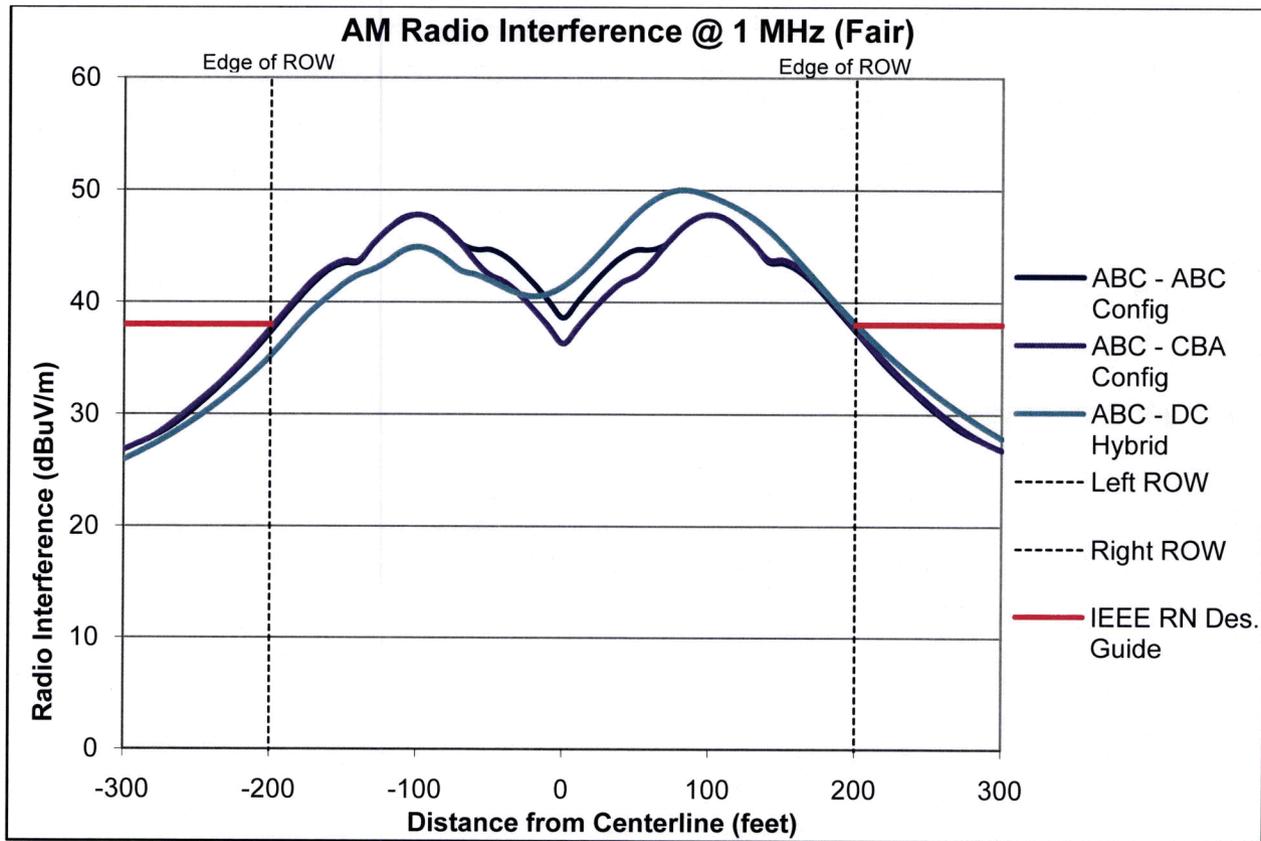


Figure 19: AM Radio Interference Across ROW for Two Circuits

### 6.5 Television Interference

Table 14 shows a summary of the television interference values in the ROW for the two different AC line phasing configurations with two transmission lines in the corridor. These values are nearly identical to those of a single transmission line. The Enviro software does not produce radio frequency interference results in the television band as it only goes up to 30 MHz. The DC line is not expected to produce significant interference in this frequency range. One quote from the EPRI *Transmission Line Reference Book HVDC to +/- 600 kV*, is “No significant TVI has ever been measured from DC lines during fair or foul weather; therefore, no attempt has been made to develop equations for calculating TVI from DC Lines.”

Table 14: Television Interference for Two Circuits [dB $\mu$ V/m @ 75 MHz]			
CASE	EDGE OF ROW	MAXIMUM IN ROW	AVERAGE IN ROW*
Second Line with A-B-C and A-B-C Phasing (L to R)	18.1	30.5	22.4
Second Line with A-B-C and C-B-A Phasing (L to R)	18.3	30.5	21.8

\* Average values based on data points calculated every ten feet across the ROW width.

Figure 20 shows a plot of the television interference levels across the ROW for the two configurations. Similar to radio interference, there is negligible difference between the two options outside of the ROW.

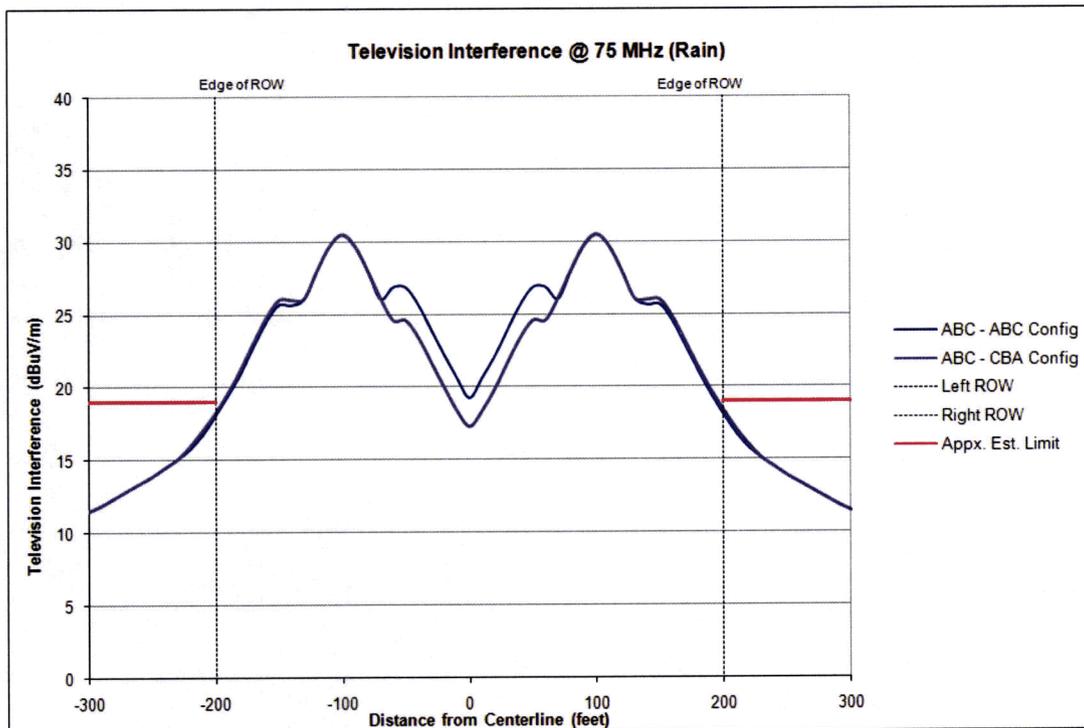


Figure 20: Television Interference Across ROW for Two Circuits

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## 7.0 GENERAL SUMMARY OF RESULTS

This report analyzed EMF and field effects for a base case horizontal guyed V structure with a three conductor bundle, and explored the effects of modifying the bundle or structure type, increases in voltage along the line, and the addition of a second AC or DC line in parallel. In general, it appears that the base case structure and bundle configuration will be acceptable based on the discussion and results in the previous sections. Adding a future second AC or DC line will produce similar results outside of the ROW as compared to a single line.

No guidance was provided on limits that could not be exceeded for any of the field effects. These limits are typically presented by state or municipal requirements; however, Arizona and New Mexico do not have any statewide requirements. All electric and magnetic fields calculated are below the International Commission on Non-Ionizing Radiation Protection (ICNIRP) reference exposure limits for both general public exposure off the ROW. Audible noise levels are below EPA recommended values for outdoor areas. Radio and television interference depend on the signal strength to categorize the effects of the interference on reception quality. Values for AM radio interference are approximately at or below typical guidelines and television interference has no published guidelines for digital television signals, although the interference produced by the lines is likely acceptable. Any additional radio frequency concerns were not presented at this time for other communications systems in the areas.

## APPENDIX A – TRANSMISSION LINE STRUCTURE DRAWINGS

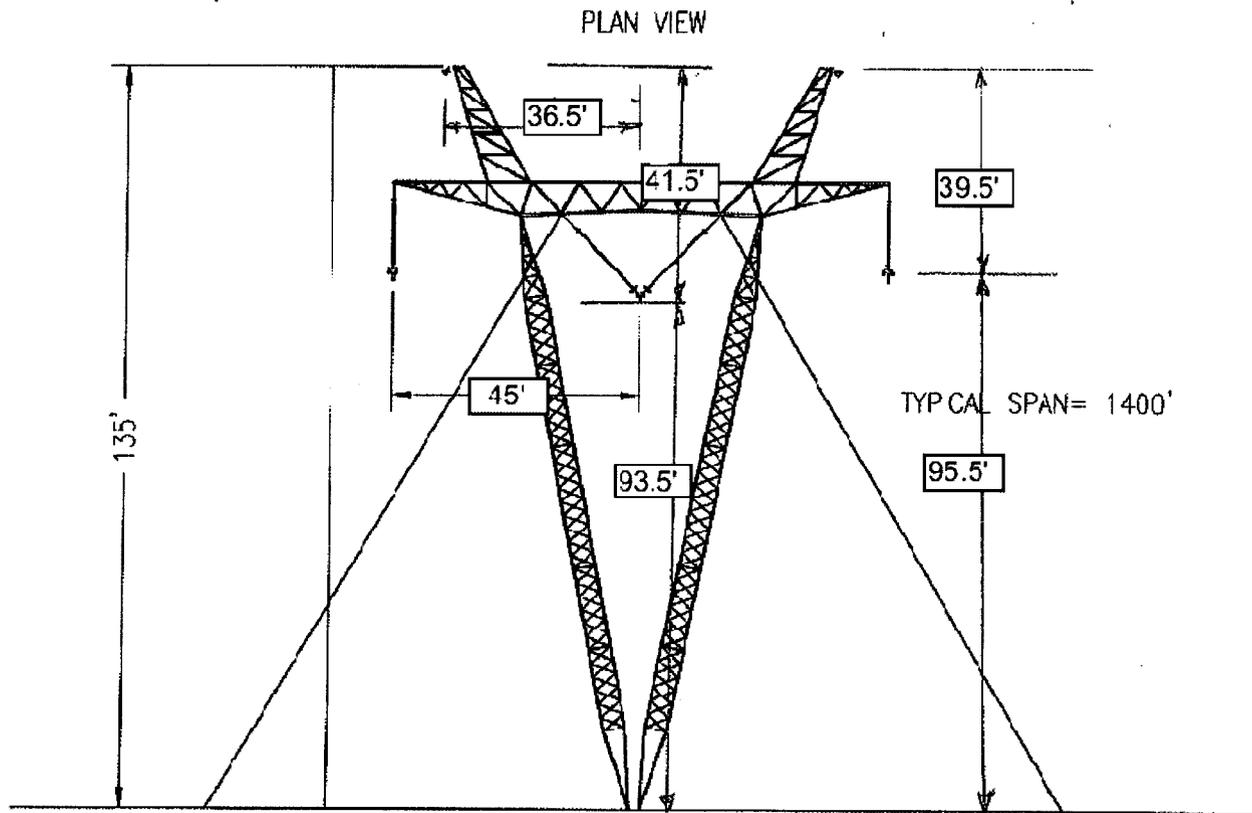


FIG. 1  
LATTICE GUYED-V

Figure 21: Horizontal Transmission Structure Configuration

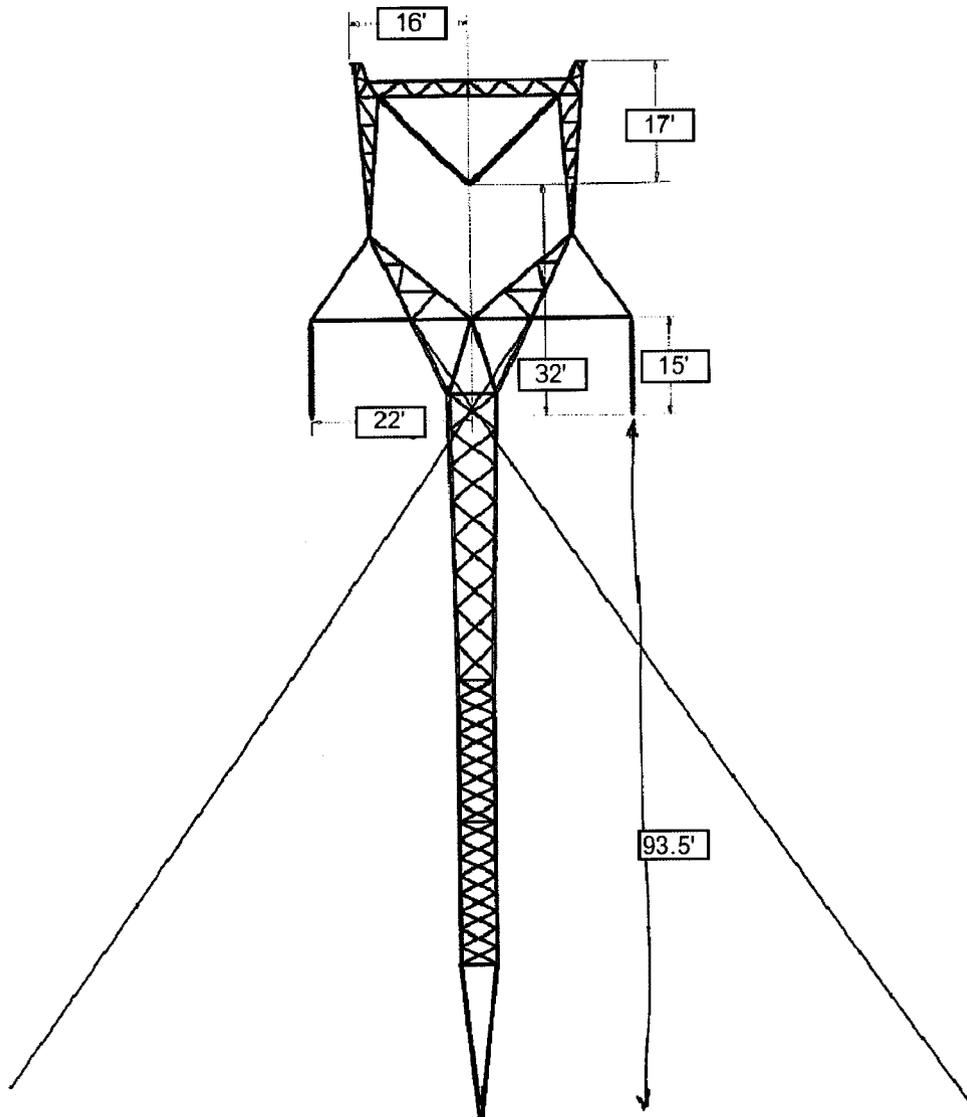


Figure 22: Delta Transmission Structure Configuration

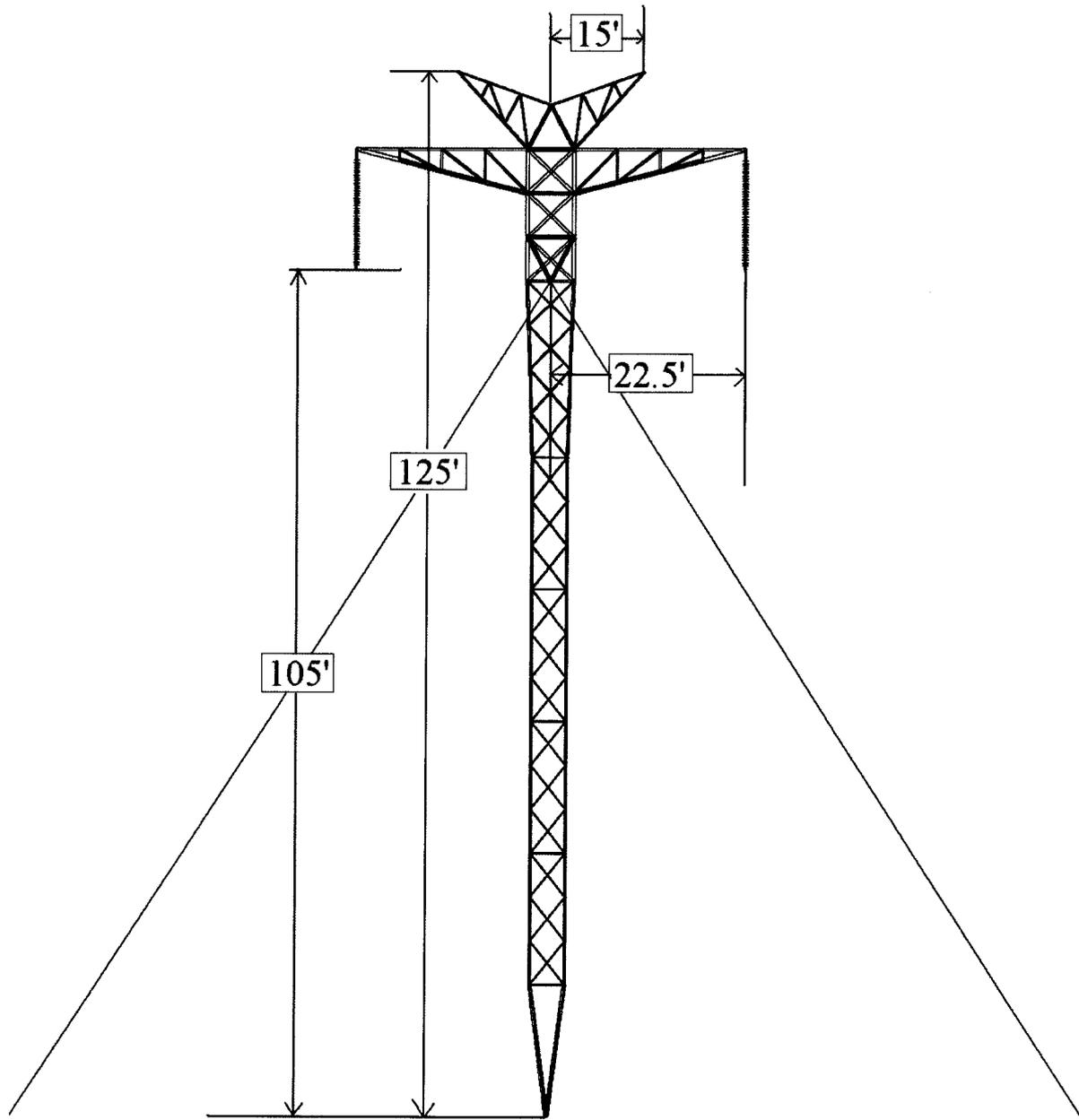


Figure 23: DC Tower Configuration

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**Exhibit J**

## EXHIBIT J – SPECIAL FACTORS

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As stated in the Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

*“Describe any special factors not previously covered herein, which Applicant believes to be relevant to an informed decision on its application.”*

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Exhibit J-1: Public Involvement Activities Summary

Exhibit J-2: Public Review of the EIS

### INTRODUCTION

This exhibit includes information on the public involvement and coordination activities conducted for the SunZia Southwest Transmission Project. Coordination with federal, state and local agencies, private and public organizations, tribes, and stakeholder groups of individuals are important to ensure that the most appropriate data have been gathered for analyses, and that agency and public comments are considered as part of the decision-making process. Throughout the preparation of the Environmental Impact Statement (EIS), formal and informal efforts were made by the Bureau of Land Management (BLM) to involve these groups in the scoping process, subsequent public involvement activities, and review of the EIS.

This exhibit provides a brief description of the public involvement, consultation, and coordination efforts during the nearly six-year National Environmental Policy Act (NEPA) process, during which interested stakeholders had numerous opportunities to review and consideration information regarding the SunZia Project, and its potential impacts on the environment.

### EXHIBIT J-1 PUBLIC INVOLVEMENT ACTIVITIES SUMMARY

#### Scoping Process

As required by the National Environmental Policy Act (NEPA), the BLM conducted scoping prior to the preparation of the EIS with cooperating agencies to encourage public participation and solicit agency and public comments on the scope and significance of the proposed action (40 CFR 1501.7). This scoping process was initiated in May 2009 with the announcement of upcoming public scoping meetings that requested comments or issues that should be addressed in the EIS.

#### Notice of Intent

The public was notified of the Project and upcoming scoping meetings through a Notice of Intent (NOI) published by the U.S. Department of Interior–BLM in the *Federal Register* on May 29, 2009. The NOI formally initiated a 45-day public scoping period for the Project. Comments were received during this 45-day period, which ended on July 13, 2009. The NOI also provided information, including a description of the proposed facilities, Project location, and a summary of the EIS process, and instructions on how to submit comments. The comment deadline was later extended to August 28, 2009, in response to requests from stakeholders.

In addition to the NOI, the BLM used a variety of other notification methods to announce the public scoping meetings and provide Project information. Concurrent with the release of the NOI, the BLM issued a news release to media in Arizona to announce the meetings. Paid display advertisements were placed in newspapers in Arizona, and radio announcements were made. These notifications are detailed in Section 4 of the Scoping Report (see Exhibit B2).

The BLM NOI letter and comment form were included with the first Project newsletter that was direct-mailed to the initial mailing list on June 3, 2009. This initial list comprised agencies, organizations, and individuals that were compiled by the BLM offices within the study area. Subsequent mailing lists expanded to include interested stakeholders such as agencies, special interest groups, and individuals who attended the public scoping meetings or who provided comments on the Project. Project newsletters and the announcement of scoping meetings were distributed to the mailing list. In addition, a direct mailer was sent out in July 2009 to announce the extension of the comment period (from July 2009 to August 2009). The BLM established a Project website<sup>1</sup> to provide information, including meeting announcements and public documents. Copies of press releases, display advertisements, and media distributions lists can be found in the Scoping Report, which are also available on the Project website.

### **Scoping Meetings**

Four formal public scoping meetings were held in Arizona during the first scoping period in June and July 2009 (Table J-1-1). These were open-house meetings held to introduce, describe, and explain the purpose and need for the Project, and to solicit the public and stakeholder input and comments regarding the Project and potential alternatives.

<b>Table J-1-1. Scoping Meetings – June and July 2009</b>		
<b>Meeting Date</b>	<b>Location</b>	<b>Public in Attendance <sup>1</sup></b>
<b>Arizona</b>		
June 22, 2009	Santa Cruz Valley Union High School 900 N. Main Street Eloy, AZ	16
June 23, 2009	Oracle Community Center 685 American Avenue Oracle, AZ	39
June 24, 2009	Manor House Convention Center 415 E. Highway 70 Safford, AZ	30
June 29, 2009	Valley Telephone Company 752 E. Maley Willcox, AZ	21
<b>Total Attendees</b>		<b>106</b>
<sup>1</sup> For purposes of this report, members of the public exclude Project-related individuals (e.g., BLM resource specialists, Applicant staff and engineers, EIS contractor personnel, and cooperating agency representatives.)		

<sup>1</sup> [http://www.blm.gov/nm/st/en/prog/more/lands\\_realty/sunzia\\_southwest\\_transmission.html](http://www.blm.gov/nm/st/en/prog/more/lands_realty/sunzia_southwest_transmission.html)

In response to comments received as a result of scoping meetings, the study area was expanded to consider additional potential alternative transmission line routes in Arizona. Meetings held during this additional Scoping Period are listed in Table J-1-2. These open house meetings presented the expanded study area and the same information used during the June and July 2009 scoping meetings to introduce, describe, and explain the purpose and need for the Project, and to solicit the public and stakeholder input and comments regarding the Project and potential alternatives.

<b>Table J-1-2. Scoping Meetings – April 2010</b>		
<b>Meeting Date</b>	<b>Location</b>	<b>Public in Attendance <sup>1</sup></b>
April 29, 2010	Holiday Inn – Airport 4550 S. Palo Verde Road Tucson, Arizona	110
<b>Total Attendees</b>		<b>110</b>
<sup>1</sup> For purposes of this report, members of the public exclude Project-related individuals (e.g., BLM resource specialists, Applicant staff and engineers, EIS contractor personnel, and cooperating agency representatives.)		

More than 200 people attended meetings in Arizona during the scoping periods (see Table J-1-1 and Table J-1-2). A full description of the scoping process, including the public scoping meetings, is provided in the Project Scoping Report and Addendum (see Exhibit B-1).

**Comments Received during Scoping**

Comments received during scoping, including the additional scoping periods to address the study area expansion in Arizona, were analyzed and documented in the Project Scoping Report and Addendum. Comments were reviewed to identify issues that should be addressed in the EIS, and to help develop a range of reasonable and feasible alternatives to the proposed action. In total, approximately 1,400 comment submittals were received. Specific issues and where they are addressed are listed in Chapter 1, Table 1-3 of the Final EIS (see Appendix B-1).

**Meetings with Interested Stakeholder Groups, Organizations, and Cooperating Agencies**

In addition to the public scoping meetings, the BLM attended meetings with representatives of interested stakeholder groups or other organizations during the scoping period, as listed in Table J-1-3. The BLM also attended and participated in meetings with cooperating agencies during the scoping period (Table J-1-4).

<b>Table J-1-3. Meetings with Interested Stakeholder Groups and Organizations during Scoping Period</b>	
The Nature Conservancy, Arizona	October 14, 2009
Winkelman Natural Resource Conservation District	January 6, 2010
Natural Resources Defense Council, The Wilderness Society, The Nature Conservancy, Center for Desert Archaeology	January 12, 2010
Pima County, Arizona, U.S. Bureau of Reclamation, National Park Service	April 2, 2010
Winkelman Natural Resource Conservation District	April 13, 2010
City of Tucson, Arizona	April 14, 2010
Redington Natural Resource Conservation District	April 15, 2010

**Table J-1-3. Meetings with Interested Stakeholder Groups and Organizations during Scoping Period**

Arizona Army National Guard, Fort Huachuca, Davis-Monthan AFB, U.S. Army Regional Coordinator, Department of Defense Regional Environmental Coordinator Officer	April 29, 2010
Pima County Regional Flood Control District	May 19, 2010
Pima County Administrator, Pima County Regional Flood Control District	July 9, 2010
Redington and Winkelman Natural Resource Conservation Districts Workshop	July 28, 2010

**Table J-1-4. Meetings with Cooperating Agencies, with Special Expertise Involving Arizona, during Scoping Period**

U.S Fish and Wildlife Service, Arizona Game and Fish Department	March 23, 2010
Arizona Game and Fish Department	May 13, 2010

**Consultation and Coordination**

Agencies, tribes, and organizations that have jurisdiction and/or specific interest in the Project were contacted at the beginning of scoping, during the resource inventory, and prior to the preparation and publication of the EIS to inform them of the Project, verify the status and availability of existing environmental data, request data and comments, and solicit their input regarding the Project. Additional contact was made throughout the scoping process to clarify or update information provided by the agencies and organizations. This section describes the consultation and coordination efforts that have occurred throughout the environmental review process.

**Cooperating Agencies**

A cooperating agency is any federal, state, or local government agency or tribe that has jurisdiction by law or special expertise regarding environmental impacts of a proposed project. Those entities that chose to contribute to the preparation of the EIS as cooperating agencies are listed in Table J-1-5. Numerous meetings with the cooperating agencies were held during the scoping period (see Table J-1-4) and during preparation of the EIS.

**Table J-1-5. Arizona Cooperating Agencies**

<b>Federal Agencies</b>	<b>State Agencies</b>
U.S. Fish and Wildlife Service National Park Service Bureau of Indian Affairs Fort Huachuca (U.S. Army) Department of Defense Siting Clearinghouse	Arizona State Land Department Arizona Game and Fish Department Arizona Department of Transportation

Meetings with cooperating agencies included, but were not limited to, the following:

- Arizona State Land Department – September 28, 2011

- Arizona Game and Fish Department – October 5, 2011
- National Park Service, U.S. Fish and Wildlife Service, Fort Huachuca (U.S. Army), Department of Defense Siting Clearinghouse, Arizona State Land Department, Arizona Game and Fish Department, Arizona Department of Transportation – January 24, 2012
- National Park Service, U.S. Fish and Wildlife Service, Fort Huachuca (U.S. Army), Department of Defense Siting Clearinghouse, Arizona State Land Department, Arizona Game and Fish Department – February 29, 2012
- National Park Service – April 19, 2012

## **Tribes**

In May 2009, the BLM contacted the following federally recognized tribes in Arizona to notify them of the Project, initiate government-to-government consultation, invite them to participate as cooperating agencies in preparation of the EIS, and to participate in the Section 106 consultation:

- Hopi Tribe
- San Carlos Apache Tribe
- Tohono O'odham Nation
- Salt River Pima-Maricopa Indian Community
- Gila River Indian Community
- Ak-Chin Indian Community
- White Mountain Apache
- Tonto Apache Tribe
- Yavapai-Apache Nation
- Pascua Yaqui Tribe
- Comanche Indian Tribe
- Navajo Nation (including Alamo Chapter)

A copy of the tribal consultation letter and tribal contact information are included in the Project Scoping Report and Addendum (see Exhibit B-2).

In recognition of the tribes' special relationship with the United States government, the BLM continues to consult with the appropriate tribal governments at an official executive level (government-to-government), in accordance with the National Historic Preservation Act (NHPA), EO 13175, and the NEPA. The BLM has provided opportunities for government officials and members of federally recognized tribes to comment on and participate in the preparation of the EIS, and notified consulted tribes of final decisions, and informed them of how their comments were addressed in those decisions. At a minimum, officials of federally recognized tribal governments will be offered the same level of involvement as state and county officials. Coordination addressed consistency with tribal plans, as appropriate; and the observance of specific planning coordination authorities (including Section 101[d][6] of the NHPA, American Indian Religious Freedom Act, EO 13007 [Indian Sacred Sites], EO 12898 [Environmental Justice]), and Secretarial Order 3206 (American Indian Rights, Federal Tribal Trust Responsibilities and the Endangered Species Act [ESA]). Although no tribes requested cooperating agency status for the preparation of the EIS, several tribes participated in Section

106 consultation, which will continue during the post-EIS phases of Project implementation prior to construction. Table J-1-6 shows tribal consultation meetings that have occurred to date.

<b>Table J-1-6. Tribal Consultation Meetings</b>	
<b>Meeting</b>	<b>Date</b>
Arizona Four Southern Tribes <sup>1</sup>	July 21, 2009
Fort Sill, Mescalero, and San Carlos Apache tribes	October 16, 2009
San Carlos Apache and White Mountain Apache tribes	October 4, 2011
Four Southern Tribes Cultural Resource Working Group	July 20, 2012
San Carlos Apache Tribe	October 18, 2012
Tohono O'odham Nation Cultural Preservation Committee	November 27, 2012
Tohono O'odham Nation Legislative Council	December 6, 2012

<sup>1</sup>Tohono O'odham Nation and the Ak-Chin Indian Community representatives were present, while the Gila River and Salt River Pima-Maricopa Indian communities were not present.

### Agency Communications

Communications and meetings with agencies, in addition to the cooperating agencies, continued throughout the NEPA process. Various meetings have been conducted at key milestones during the environmental studies to obtain input or refine alternatives and data prior to detailed analysis. Table J-1-7 lists the agencies that have been contacted as part of the NEPA process.

In addition to the meetings held during scoping, noted in Table J-1-3, the BLM met with the NRCD on June 14 and July 11, 2011, and December 18, 2012. As reflected in the letter from the chairpersons of the Redington and Winkelman NRCD to the DOI dated July 28, 2011, the NRCD declined an invitation to participate as a cooperating agency.

<b>Table J-1-7. Contacts with Other Agencies</b>	
<b>Federal Agencies</b>	
Department of Defense U.S. Air Force – Davis Monthan AFB	Department of the Interior Bureau of Reclamation Bureau of Land Management U.S. Forest Service Cibola National Forest Southwestern Regional Office
<b>Arizona State Agencies</b>	
Arizona Army Air National Guard Arizona Geological Survey Arizona State Historic Preservation Officer Arizona State Land Department Arizona Department of Transportation Arizona State Museum	
<b>Arizona – Local Agencies</b>	
Cochise County	

**Table J-1-7. Contacts with Other Agencies**

<p>City of Benson                  City of Willcox                  Graham County                  Greenlee County                  Pima County                  Pima County Flood Control District                  Redington Natural Resource Conservation District                  Winkelman Natural Resource Conservation District</p>
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**Interest Groups and Other Stakeholders**

Local interest groups and stakeholders were also invited to attend the scoping meetings and provide comments (Table J-1-8). BLM representatives attended a meeting with representatives of the Natural Resources Defense Council, the Wilderness Society, and TNC on January 12, 2010, and a meeting held by the Cascabel Working Group on January 13, 2010.

**Table J-1-8. Interest Groups and Other Stakeholders**

<p>Anam, Inc.                  Apaches of Aravaipa Canyon                  Aravaipa Property Owners Association                  Arid Lands Resource Sciences                  Arizona Archaeological Council                  Arizona Native Plant Society                  Blue Goose Alliance                  Cascabel Hermitage Association                  Cascabel Working Group                  Center for Biological Diversity                  Center for Desert Archaeology                  Coalition for Sonoran Desert Protection                  Community Watershed Alliance                  Continental Divide Trail Alliance                  Duke Energy                  Earth Justice                  Empire-Fagan Coalition                  Eureka Springs Property Owner Association                  Freeport Sierrita, Inc.</p>	<p>Friends of Saguaro National Park                  Friends of the Aravaipa Region                  J-6/Mescal Community Development Organization                  Jaguar Habitat Campaign                  Lennar Corporation – Tucson Land Division                  National Parks Conservation Association – Southwest                  National Trust for Historic Preservation                  Natural Resources Defense Council                  Saguaro Juniper Corporation                  Salt River Project                  Sierra Club – Grand Canyon Chapter                  Sonoran Institute                  Southern AZ Hiking Club – Cochise Trails Association                  The American Consumer Institute                  The Gamez Cemetery                  The Nature Conservancy                  The Peyote Way Church                  The Wilderness Society</p>
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**Applicant Participation**

Commensurate with the memorandum of understanding and the EIS Preparation Plan, the Applicant has provided technical and clarifying information about the Project, attended and participated in meetings, and provided comments on documents prepared for the draft EIS. The Applicant has also reviewed and provided the technical, environmental, and socioeconomic information in its possession.

The Applicant has communicated extensively with representatives of various federal, state, and local government agencies and several stakeholder groups and organizations regarding the

Project plans. BLM representatives attended a meeting hosted by the Applicant, with representatives of the Cascabel Working Group on January 13, 2010.

Briefings or other meetings held with Arizona organizations and individuals are listed in Table J-1-9.

<b>Table J-1-9. Arizona Briefings</b>	
<b>Affiliation</b>	<b>Name</b>
Access Arizona	Jim Dinkle
Arizona Congressional District #1	Congresswoman Ann Kirkpatrick (Blanca Varela)
Arizona Congressional District #2	Congresswoman Martha McSally (Sarah Pacheco)
Arizona Congressional District #4	Congressman Paul Gosar (Jim Knupp)
Arizona Corporation Commission	Commissioner Susan Bitter Smith (Laurie Woodall)
Arizona Corporation Commission	Commissioner Bob Stump (Amanda Ho)
Arizona Corporation Commission	Commissioner Bob Burns (Angie Paton)
Arizona Corporation Commission	Commissioner Doug Little (Matt Rowell)
Arizona Corporation Commission	Commissioner Tom Forese (Brandon Nelson)
Arizona Corporation Commission – Utilities Division	Tom Broderick
Arizona Governor Doug Ducey	Chris McIsaac
Arizona Governor Doug Ducey	Hunter Moore
Arizona Governor Doug Ducey	Juan Ciscomani
Arizona Legislative District #11	Senator Steve Smith
Arizona Legislative District #11	Representative Vince Leach
Arizona Legislative District #11	Representative Mark Finchem
Arizona Legislative District #14	Representative David Stevens
Arizona Legislative District #14	Representative David Gowan
Arizona Legislative District #14	Senator Gail Griffin
Arizona Legislative District #8	Representative Frank Pratt
Arizona Legislative District #8	Representative TJ Shope
Arizona Siting Committee	Tom Chenal
Arizona State Land Department	Commissioner Lisa Atkins
Benson Chamber of Commerce	Lupe Diaz
City of Benson – City Manager	Bill Stephens
City of Benson - Mayor	Mayor Toney King
City of Coolidge – City Manager	Bob Flatley
City of Eloy – City Council	Councilmember Belinda Akes
City of Eloy – City Manager	Harvey Krauss
City of Safford – City Manager	Horatio Skeete
City of Safford – Mayor	Mayor Chris Gibbs
City of Willcox – City Council	Mayor and Councilmembers
City of Willcox – City Manager	Ted Soltis
City of Willcox – Mayor	Mayor Bob Irvin

Cochise County - Board of Supervisors	Supervisor Richard Searle
Cochise County - Board of Supervisors	Supervisor Patrick Call
Cochise County - Board of Supervisors	Supervisor Ann English
Cochise County – County Administrator	Jim Vlahovich
Eastern Arizona College	Kevin Peck
Eastern Arizona Counties Organization	Pascal Berlioux
Eloy Chamber of Commerce	Mark Benner
Graham County – Board of Supervisors	Supervisor Jim Palmer
Graham County – Board of Supervisors	Supervisor Danny Smith
Graham County – Board of Supervisors	Supervisor Drew John
Graham County – County Manager	Terry Cooper
Graham County Chamber of Commerce	Laurabeth Stoner
Greenlee County – Board of Supervisors	Supervisor David Gomez
Greenlee County – Board of Supervisors	Supervisor Ron Campbell
Greenlee County – Board of Supervisors	Supervisor Robert Corbell
Greenlee County – County Administrator	Kay Gale
Greenlee County – Economic Development	Akos Kovach
Pima County – Board of Supervisors	Supervisor Ally Miller
Pima County – Board of Supervisors	Supervisor Ramon Valadez
Pima County – Board of Supervisors	Supervisor Sharon Bronson
Pima County – Board of Supervisors	Supervisor Ray Carroll
Pima County – County Administrator	Chuck Huckelberry
Pinal County – Board of Supervisors	Supervisor Pete Rios
Pinal County – Board of Supervisors	Supervisor Cheryl Chase
Pinal County – Board of Supervisors	Supervisor Todd House
Pinal County – Board of Supervisors	Supervisor Steve Miller
Pinal County – Board of Supervisors	Supervisor Tony Smith
Pinal County – County Manager	Greg Stanley
Senator John McCain	Rick Stilgenbauer
Southeast Arizona Economic Development Group	George Scott
SouthEastern Arizona Governments Organization	Larry Catten
Southern Arizona Business Coalition	Rick Grinnell
Town of Clifton – Town Manager	Ian Mcgaughey
Town of Thatcher – Town Manager	Terry Hinton
Tucson Metropolitan Chamber of Commerce	Michael Varney
Willcox Chamber of Commerce	Alan Baker

## EXHIBIT J-2 PUBLIC REVIEW OF THE EIS

Concurrent with the distribution of the Draft EIS/Resource Management Plan Amendment (RMPA), a Notice of Availability (NOA) was published in the *Federal Register*, announcing the availability of the draft document for a 90-day public review and comment period that started on May 25, 2012, and ended on August 22, 2012. The Draft EIS/RMPA was sent to cooperating agencies, agencies with a potential interest in the Project, and others who requested copies. Printed versions of the Draft EIS documents were made available for review at libraries, BLM offices, and public meeting sites, and were also provided in response to individual requests.

The availability of the Draft EIS/RMPA for public review and comment, along with the locations and times of public meetings, was announced in paid newspaper legal notices and advertisements. In addition, Project newsletters were mailed to individuals, agencies, and organizations that requested notification of the availability of the Draft EIS/RMPA. During the

90-day public review period, five public open house meetings were held in Arizona in June and July 2012 for the BLM to provide information and receive public input on the Draft EIS/RMPA (Table J-2-1). These meetings were held in Cochise, Graham, Pima, and Pinal counties in Arizona.

<b>Table J-2-1. Public Meetings – June and July 2012</b>		
<b>Meeting Date</b>	<b>Location</b>	<b>Public in Attendance<sup>1</sup></b>
<b>Arizona</b>		
July 11, 2012	Safford High School 1400 W. Bulldog Blvd. Safford, AZ	22
July 12, 2012	Benson School 360 S. Patagonia St. Benson, AZ	41
July 17, 2012	Palo Verde Magnet School 1302 S. Avenida Vega Tucson, AZ	77
July 18, 2012	San Manuel High School 711 S. McNab Pkwy. San Manuel, AZ	19
July 19, 2012	Eloy Junior High School 404 E. Phoenix Ave. Eloy, AZ	10
Total Attendees		169
<sup>1</sup> For purposes of this report, members of the public exclude Project-related individuals (e.g., BLM resource specialists, Applicant staff and engineers, EIS contractor personnel, and cooperating agency representatives.)		

### **Comment Analysis Process**

Comments on the Draft EIS/RMPA were submitted in person at the public meetings, electronically through the BLM SunZia Project website, or mailed to the BLM NM State Office. All comments received during the 90-day review period were recorded and compiled in a database, in which each comment was assigned a unique identifying number. The BLM received over 900 comment submittals (letters or other correspondence), including over 2000 individual comments. In compliance with the requirements of the Council on Environmental Quality (CEQ) for implementing the NEPA, the comments were then analyzed and responses to substantive comments were provided. Per the BLM NEPA Handbook H-1790-1, substantive comments do at least one of the following:

- question, with reasonable basis, the accuracy of information in the EIS
- question, with reasonable basis, the adequacy of, methodology for, or assumptions used for the environmental analysis
- present new information relevant to the analysis
- present reasonable alternatives other than those analyzed in the EIS
- cause changes or revisions in one or more of the alternatives

Comments not considered substantive include those:

- in favor of or against the proposed action or alternatives without reasoning that meets the BLM's criteria for substantive comments
- only agreeing or disagreeing with BLM policy or resource decisions without justification or supporting data that meet the BLM's definition of substance
- comments that do not pertain to the Project area or the Project
- comments that take the form of vague open-ended questions

A complete list of individual letters that commented on the Draft EIS is included in Appendix J of the EIS (see Exhibit B-1).

### **General Summary of Comments**

Comments identified during scoping were addressed in development of the Draft EIS. The key issues and concerns were related to one of the following categories:

- Project purpose and need
- Alternative development – comments indicating another alternative should be evaluated
- Alternative description and mitigation measures – comments suggesting modifications to already defined alternatives to reduce or avoid potential impacts
- Analysis of environmental effects – comments specifying concerns over resource impacts or suggesting that other effects be considered and disclosed

The Draft EIS addressed issues identified during scoping. Comments received during the public review of the Draft EIS related to these issues either raised questions, suggested other alternatives, provided new information, or expressed preferences. In the development of the Final EIS, information was added to clarify or correct the Draft EIS, and modifications to alternative transmission line descriptions were made, where warranted, to incorporate new information and requests for additional mitigation.

### **Responses to Key Issues and Concerns**

The following comments (paraphrased and italicized) are representative of key issues and concerns raised by stakeholders in response to the Draft EIS. Summary responses to these comments are also provided below. Appendix J of the EIS provided detailed responses to the comments (see Exhibit B-1).

#### **Purpose and Need**

*It was understood that a purpose of the Project was to provide new transmission to deliver electricity generated by renewable energy resources Southeastern Arizona to western power markets. Clarify the potential for interconnection with fossil fuel energy generation facilities.*

As stated in Chapter 1 of the Final EIS, the BLM's purpose and need for the proposed Project is established by regulatory obligations and directives, and current energy development trends. The purpose and need is used to formulate a reasonable range of alternatives to be considered in the EIS. The need for the BLM's proposed action arises from the Federal Land Policy and Management Act (FLPMA) to consider the Applicant's right-of-way application. The Applicant's objectives as stated in Section 1.4 of the EIS include increasing "available transfer capability in an electrical grid that is currently insufficient to support the development, access,

and transport of additional energy-generating resources, including renewable energy in Arizona.” The range of alternatives considered included potential transmission line routes that could provide electrical interconnections with renewable energy resources located primarily within the Qualified Resource Areas for solar energy located in southeastern Arizona.

Transmission facility services are to be provided without discrimination as to the type of generation requesting interconnection and transmission service. Although Federal Energy Regulatory Commission (FERC) rules do not allow for discriminatory preference among generation subscribers to a transmission line, it is the intent of the Applicant to provide infrastructure to increase transfer capability within areas of potential renewable energy generation. Indirect and cumulative impacts associated with construction and operation of generation facilities have been analyzed and documented in Section 4.17 of the EIS.

### **Proposed Action and Alternatives**

*A preference would be to construct new transmission lines in areas where there are existing utilities and access. Avoid building new transmission lines in the San Pedro River Valley, Aravaipa/Sulphur Springs Valley, Avra Valley and particularly avoid lines crossing riparian areas along the San Pedro River and Rio Grande. Avoid building transmission lines in areas where military operations are conducted.*

In order to identify potential locations for the proposed transmission line routes, information was gathered to determine environmental, engineering, and agency/public/political opportunities and constraints within the study area. Potential alternatives were reviewed based on their ability to maximize opportunities to locate the proposed transmission lines within existing corridors, while avoiding areas of higher constraint or sensitivity. Alternative transmission line routes were considered within the I-10 corridor in Arizona; it was found that there is insufficient area available for the proposed right-of-way adjacent to I-10 due to existing residential, commercial, and industrial development.

In response to information received following the Draft EIS, modifications to the alternative transmission line routes were developed and additional analysis was conducted. The alignment of the BLM preferred alternative was modified in response to substantive recommendations that provided additional information. The BLM preferred alternative was selected because it would maximize use of existing utility corridors and infrastructure, minimize impacts to sensitive resources, minimize impacts at river crossings, and minimize impacts to residential and commercial uses. Where available, portions of the route would follow existing utilities or other roads that would provide access for construction and maintenance. Approximately 117 miles (59 percent) of the Arizona portion of the BLM preferred alternative (total length is 199 miles) would be parallel to existing or designated utility corridors.

*To what extent have alternative technologies or systems such as underground construction, transmission system upgrades in existing rights-of-way, alternative voltages, demand-side management or distributed generation been considered?*

The BLM considered other options, including alternative transmission routes and transmission technologies, but eliminated them from consideration because they would not be practicable and feasible, as described in Section 2.3.3 of the Final EIS.

## **Funding**

### *How Is the Project Being Funded?*

The proposed action does not require a cost outlay by the federal government. As provided in the Memorandum of Understanding between the Applicant and the BLM, it is the Applicant's responsibility to reimburse the federal government for expenses to process the right-of-way application under a cost recovery agreement. Federal government financing for development and construction of the Project is not a condition of the proposed action.

## **Water and Soil Resources**

*Construction of transmission facilities across environmentally sensitive lands could result in soil erosion that would affect grasslands, playas, rivers and streams. Previous construction of many pipelines and roads has led to severe erosion where proper controls were not used.*

Earth and water resources studies have been completed to identify specific locations of potentially high levels of wind and water soil erosion. Mitigation measures are proposed that would include Best Management Practices (BMPs) and special construction methods where needed to minimize the potential for erosion in those areas.

## **Biological Resources**

*The proposed Project route and alternatives would cross a major migratory bird corridors along the San Pedro River. Other areas of concern include the Willcox playas and Picacho Reservoir area. The proposed transmission line project would pose a collision risk to birds.*

The highest risk occurs when transmission lines are sited near roosts or foraging areas, and collisions may also occur at night or in poor weather. The collision risk to migratory birds would be mitigated through the placement of bird diverters or similar devices in high-risk areas, to be specified in an Avian Protection Plan. Monitoring would take place to ensure proper function and effectiveness of the devices. Mitigation for lost productivity or habitat for migratory birds would be developed under the terms of EO 13186 according to the Migratory Bird Treaty Act (MBTA) and in cooperation with the BLM and USFWS.

*The Project would result in ground disturbance that may be temporary or permanent for the life of the Project. Ground disturbance causes the direct loss of native vegetation, and may facilitate the spread of invasive plants. Linear utilities can result in wildlife habitat fragmentation, when constructed in a way that provides a physical barrier to wildlife movement or causes changes in the habitat that reduce the movement of wildlife across the utility corridor. This may include the creation of open spaces avoided by certain species, or disturbance and road mortality associated with construction and recreational traffic.*

In accordance with the results of the biological resources impact analysis, mitigation measures have been proposed to avoid or minimize the loss of sensitive riparian vegetation, grasslands and other sensitive habitats. Habitat fragmentation and loss of native vegetation would be addressed through standard and selective mitigation measures during construction and maintenance, according to stipulations for reducing ground disturbance, avoiding disturbance to wildlife

during sensitive seasons, and closing or reclaiming temporary roads. Site-specific mitigation would be provided in the final Plan of Development (POD) to include a biological resources protection plan, monitoring during construction, control or prevention of the spread of noxious weeds and other invasive plants, reclamation, and other measures.

*The San Pedro River Valley is one of the last free-flowing rivers in the Southwest, and a major migratory bird corridor. Portions of the river that support perennial flow often have mature riparian woodlands and mesquite bosques, and tributaries to the river support threatened or endangered fish and other native aquatic species. Major tributaries of concern with perennial flow include Aravaipa, Hot Springs, Redfield, and Buehman canyons. Removal of riparian woodland and mesquite bosque, creation of new access roads, potential effects on water quality through erosion, and the collision risk for birds are noted.*

The BLM preferred alternative would cross the San Pedro River at a location without perennial flow or riparian woodlands, where elevated terrain would allow transmission lines to span the floodplain and minimize the need for vegetation management. Mitigation measures have been proposed to minimize the potential for soil erosion and vegetation loss, including reclamation or closure of access roads where necessary and practicable at the discretion of the respective landowner or land management agency.

### **Cultural Resources and Native American Concerns**

*Impacts to cultural resources could result from a loss of integrity on prehistoric and historic sites. The Project could also indirectly affect traditional cultural properties such as Mt. Graham or other important sites. Types of potential impacts to cultural resources may include ground disturbance, visual and auditory intrusions, and disturbances to sites due to changes in public accessibility during and after construction.*

Inventories of previously recorded sites along the alternative study corridors have been conducted. Impacts to cultural resources have been evaluated in the EIS according to potential sensitivity of known cultural resources. Intensive pedestrian surveys along the selected route, including access roads, substations, and other facilities, would be conducted prior to construction if the BLM approves an action alternative in the ROD. Direct impacts to significant cultural resources can be effectively minimized, if not eliminated, through mitigation planning. In designated areas, structures would be placed to avoid and or span sensitive cultural resource sites or features.

All cultural and historic resources identified during the inventory will be evaluated for eligibility to the National Register of Historic Places. Consultation with appropriate land management agencies, tribal governments, and State Historic Preservation Offices is ongoing and will result in a Programmatic Agreement, which establishes a project-specific procedure for complying with the NHPA, including procedures to follow during the execution of the Project.

### **Land Use, Property Values, and Right-of-Way Acquisition**

*How will the SunZia Transmission Project affect property values?*

Studies regarding the effects of transmission lines on property values have been reviewed. These studies found that in cases where there is a decrease in property value, the effects would generally be 10 percent or less. The discussion of property value effects is included in Section 4.13.4.5 of the EIS.

*Will I be paid for right-of-way acquisition?*

On private lands, the Applicant or owners' representative would negotiate the amount and terms of compensation with individual property owners, including market value compensation for residual impacts.

*Various agencies and groups fund and/or help manage conservation easements for a variety of conservation purposes, including reclamation, rehabilitation, riparian protection, habitat and species protection, and invasive species removal. The Project could impact existing and proposed conservation plans and easements located throughout the study area, as well as grazing lands that have been identified for conservation purposes in Pima County, Arizona.*

There are conservation plans in several locations, including the Pima County Sonoran Desert Conservation Plan, and The Lower Sonoran Conservation Initiative. Many of these areas are state trust and private lands used for grazing and other activities (see sections 3.6.7, 3.10.1.3, 3.10.3.3, 4.6.4.5, and 4.10.5 of the Final EIS [Exhibit B-2]). Where these lands are protected by recorded easements or designations, right-of-way would be acquired on a case-by-case basis in compliance with restrictions, conditions, and mitigation requirements. Project alternatives avoid crossing conservation easements, where easements have been identified.

### **Visual and Scenic Resources**

*Visual resources are an important component of the natural landscape within large portions of the study area. The Project would cause impacts to viewers and scenic resources from locations such as rural residences, travel routes, wilderness, recreation areas and cultural resource sites.*

The locations of alternative transmission line routes were identified according to the study of opportunities and constraints, which included avoidance of potential visual impacts where feasible (e.g., placing new transmission lines within existing utility corridors to reduce contrast). With respect to the Proposed Route, visual resource impacts have been thoroughly analyzed and mitigation measures have been proposed to minimize impacts to sensitive resources (see sections 3.9 and 4.9, as well as Appendix D of the final EIS).

### **Public Review and Comment**

*The public review period should have been extended beyond 90 days with opportunities for additional public meetings or hearings.*

The Draft EIS was made available for public review and comment on May 25, 2012. The BLM held five public meetings in Arizona and scheduled a 90-day public comment period that ended on August 22, 2012. A 45-day public comment period is generally the time provided for a Draft EIS; however, the BLM's planning regulations and guidance require a minimum 90-day public comment period for land use plan amendments. Comments were received by the BLM New

Mexico State Office during this 90-day review period. In addition, substantive comments that were received through March 2013 were considered in preparation of the Final EIS.

In total, public involvement for the SunZia Project in Arizona included 10 public meetings (15 scoping meetings and 5 public meetings following publication of the Draft EIS), and 300 days of public comment (180 days during scoping, 90 days during Draft EIS public review, and 30 days following publication of the Final EIS).

**APPLICATION FOR A  
CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY  
MAP VOLUME**

**EXHIBIT A – LOCATION AND LAND USE MAPS**

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Exhibit A-1 – Land Ownership and Jurisdiction .....

Exhibit A-2 – Existing Land Use..... panels a through g

Exhibit A-3 – Future Land Use..... panels a through g

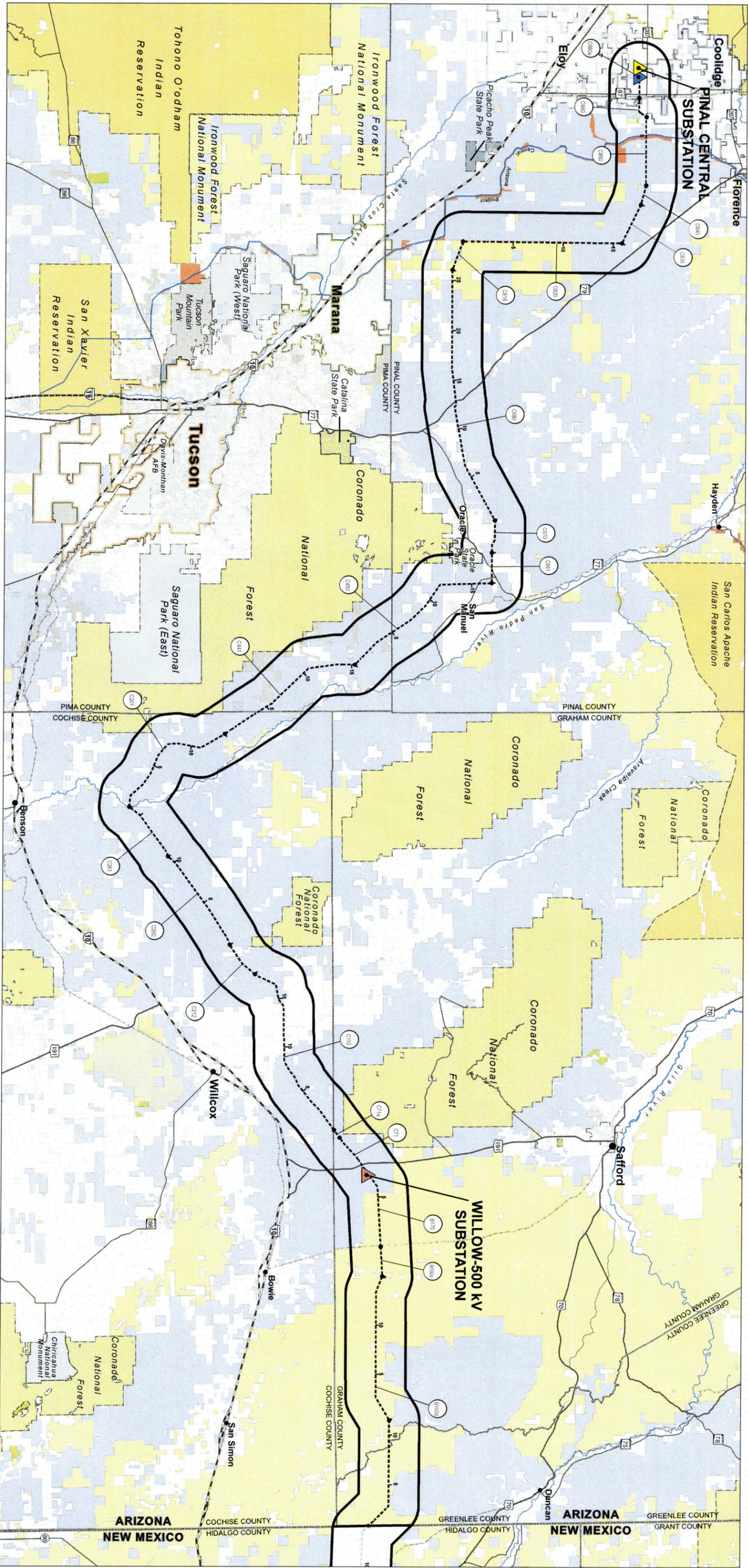
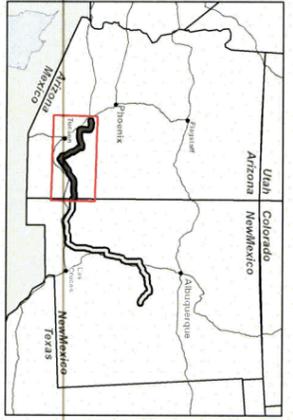


Exhibit A1

**Ownership and Jurisdiction**  
**SUNZIA SOUTHWEST TRANSMISSION PROJECT**



**Ownership/Jurisdiction**

- |                              |                     |
|------------------------------|---------------------|
| Bureau of Land Management    | City of Casa Grande |
| National Park Service        | City of Coolidge    |
| U.S. Forest Service          | City of Eloy        |
| Military                     | Town of Florence    |
| Bureau of Reclamation        | Town of Marana      |
| Indian Reservation           | City of Tucson      |
| State Trust Land             |                     |
| State Park (Arizona land)    |                     |
| State Park (Other Landowner) |                     |
| Arizona Game and Fish        |                     |
| County (Pima County)         |                     |
| Private/Other                |                     |

**City/Town Boundary**

- |                     |
|---------------------|
| City of Casa Grande |
| City of Coolidge    |
| City of Eloy        |
| Town of Florence    |
| Town of Marana      |
| City of Tucson      |

**Reference Features**

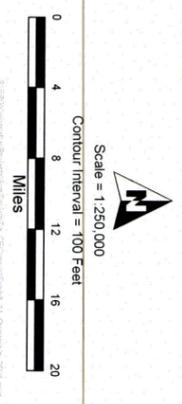
- |                         |                 |
|-------------------------|-----------------|
| City/Town               | State Highway   |
| US Highway              | Interstate      |
| Interstate              | Railroad        |
| State Boundary          | County Boundary |
| Jurisdictional Boundary | River/Stream    |
| Central Arizona Project |                 |

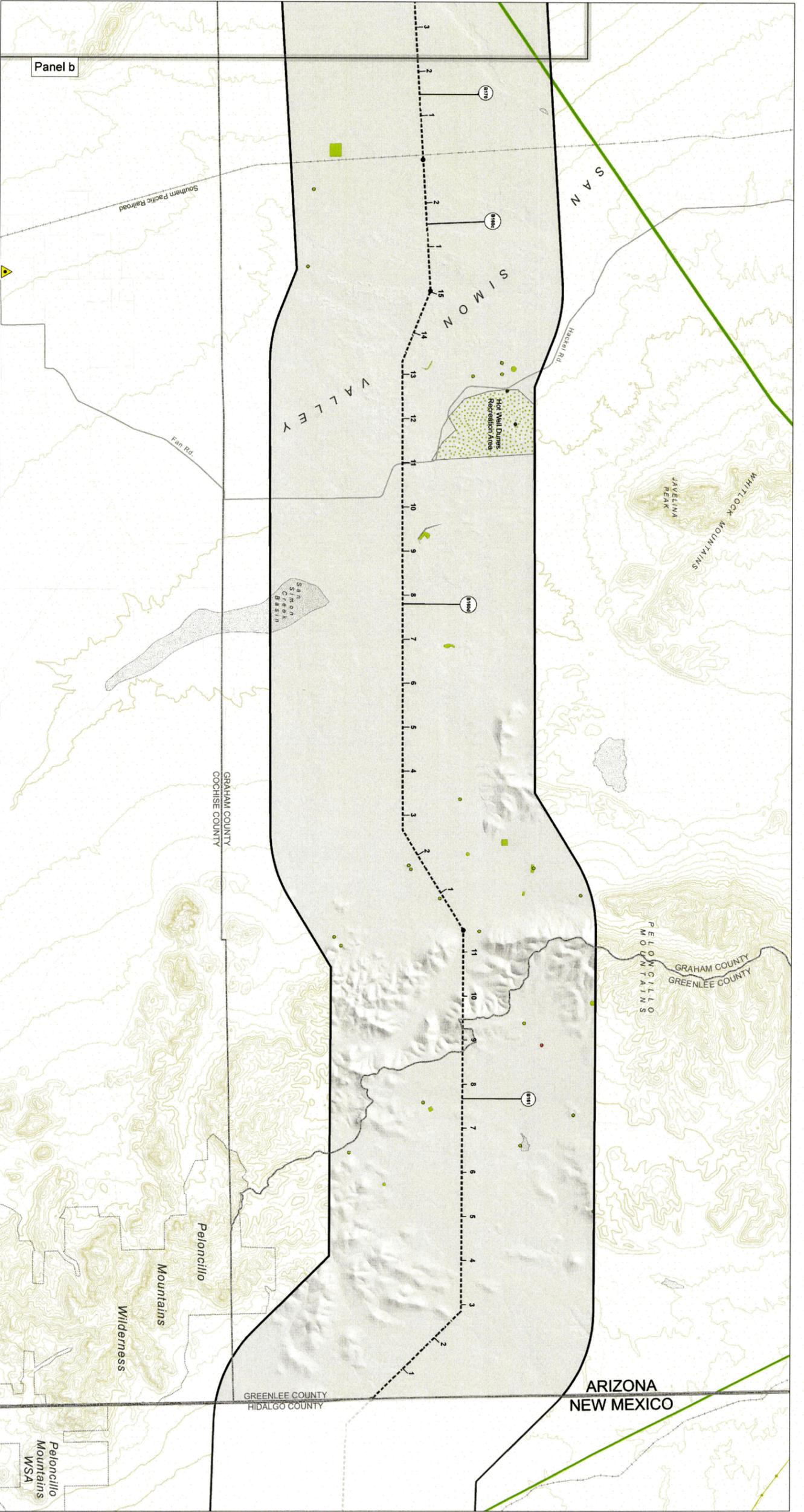
**Project Features**

- |   |                                   |
|---|-----------------------------------|
| Existing Substation                           | Proposed Willow 500 kV Substation |
| Proposed 500 kV DC Converter Station (option) | Millepost Identifier              |
| Proposed Route                                | Proposed Route Centerline         |
| Link Node                                     | Study Corridor                    |
| Link Identifier                               | Link Identifier                   |

**Sources**

- Arizona Bureau of Land Management, 2014
- Arizona State Land Department, 2014
- Esri StreetMap, 2013
- EPG LLC 2015





Panel b

Exhibit A-2a  
**SUNZIA SOUTHWEST  
 TRANSMISSION PROJECT**



**Existing Land Use**

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li> Agriculture</li> <li> Air Facilities</li> <li> Commercial</li> <li> Communication Facilities</li> <li> Industrial</li> <li> Parks/Preservation</li> <li> Public/Quasi-Public</li> <li> Residential</li> <li> School/Educational Facilities</li> <li> Utilities</li> <li> Scenic/Historic Road</li> <li> Arizona National Scenic Trail</li> <li> Recreation Trail</li> <li> Trailhead</li> </ul> | <ul style="list-style-type: none"> <li> BLM Rights of Way</li> <li> Avoidance Area</li> <li> Exclusion Area</li> <li> Pima County</li> <li> Grazing Lease (Arizona State Trust Land)</li> <li> Conservation/Preservation (county owned)</li> <li> The Nature Conservancy</li> <li> TNC Easement/Private Fee</li> <li> Conservation Lands-BLM</li> <li> Private-Full Fee</li> <li> Forest Legacy Parcels</li> </ul> |
|---|--|

**Utilities**

- Existing Substation
- Proposed Willow
- Proposed 500 KV Substation
- Converter Station (option)
- 500 KV Transmission Line
- 345 KV Transmission Line
- 230 KV Transmission Line
- 138 KV Transmission Line
- Future 230 KV Transmission Line (Permitted)
- Pipeline
- Canal

**Reference Features**

- City/Town
- Interstate
- Highway
- Local Road
- Railroad
- River/Stream
- State Boundary
- County Boundary
- City/Town Boundary
- Jurisdictional Boundary
- Wilderness/ Wilderness Study Area
- Lake/Reservoir

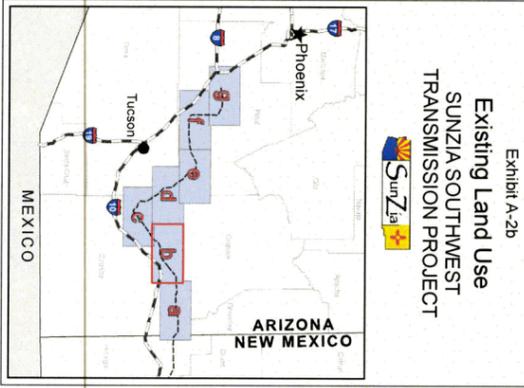
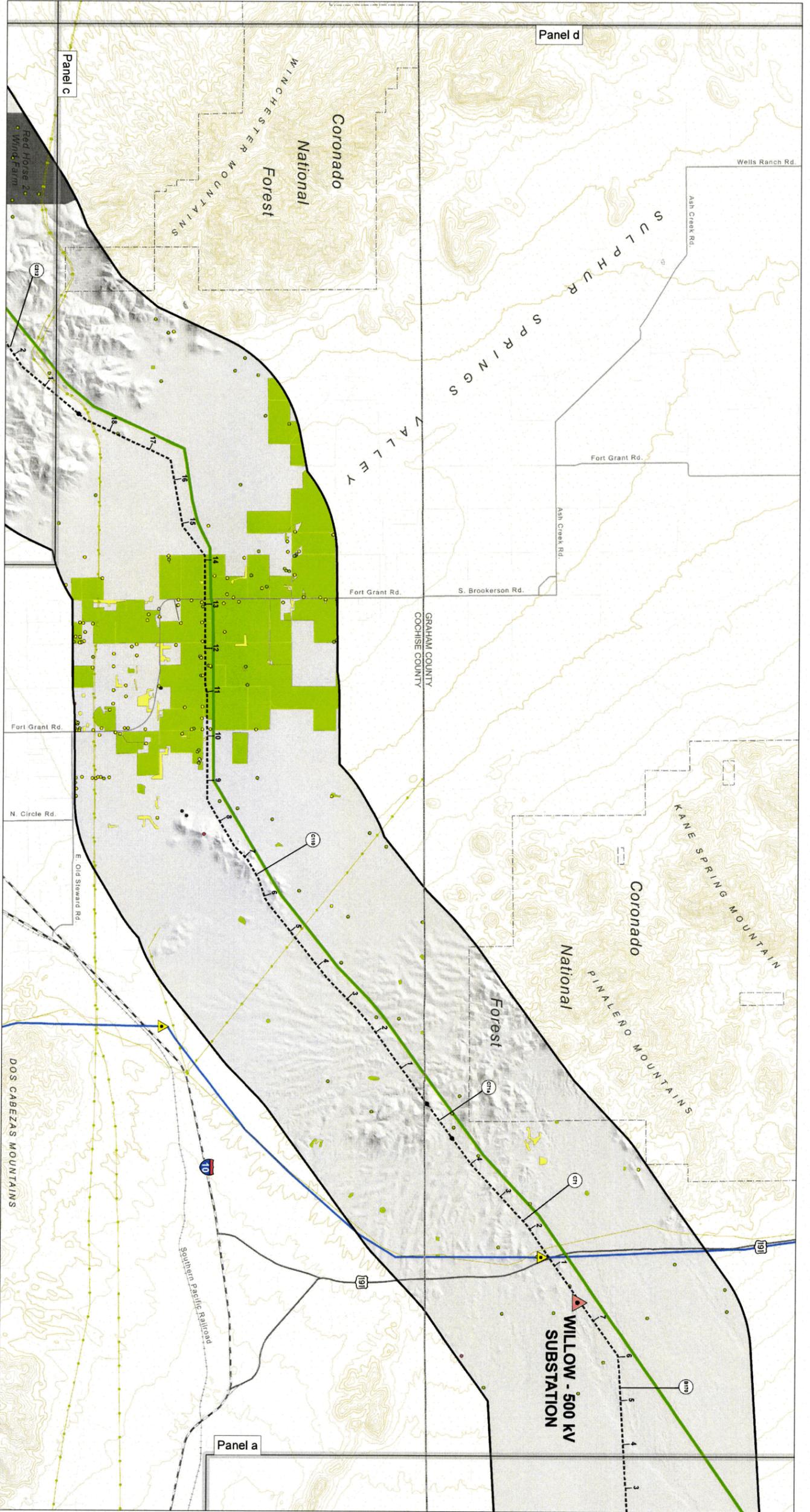
**Project Features**

- Milepost Identifier
- Proposed Route
- Link Node
- Study Corridor
- Link Identifier

**Sources**

- Bureau of Land Management, Arizona State Office, 2010
- Arizona State Land Department and ALRIS, 2010
- The Nature Conservancy, 2010
- Pima County, 2010
- ESRI, StreetMap, 2013
- USGS, 2015





**Existing Land Use**  
SUNZIA SOUTHWEST TRANSMISSION PROJECT



**Existing Land Use**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li> Agriculture</li> <li> Air Facilities</li> <li> Commercial</li> <li> Communication Facilities</li> <li> Industrial</li> <li> Parks/Preservation</li> <li> Public/Quasi-Public</li> <li> Recreation</li> <li> Residential</li> <li> School/Educational Facilities</li> <li> Utilities</li> <li> Scenic/Historic Road</li> <li> Arizona National Scenic Trail</li> <li> Recreation Trail</li> <li> Trailhead</li> </ul> | <ul style="list-style-type: none"> <li> BLM Rights of Way</li> <li> Avoidance Area</li> <li> Exclusion Area</li> <li> Pima County</li> <li> Grazing Lease (Arizona State Trust Land)</li> <li> Conservation/Preservation (county owned)</li> <li> The Nature Conservancy</li> <li> TNC Easement/Private Fee</li> <li> Conservation Lands-BLM</li> <li> Private-Full Fee</li> <li> Forest Legacy Parcels</li> </ul> |
|--|--|

**Utilities**

- Existing Substation
- Proposed Willow 500 kV Substation
- Proposed 500 kV DC Converter Station (option)
- 500 kV Transmission Line
- 345 kV Transmission Line
- 230 kV Transmission Line
- 138 kV Transmission Line
- 115 kV Transmission Line (Permitted)
- Pipeline
- Canal

**Reference Features**

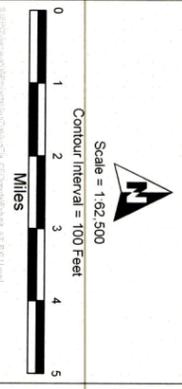
- City/Town
- Interstate
- Highway
- Local Road
- Railroad
- River/Stream
- State Boundary
- County Boundary
- City/Town Boundary
- Jurisdictional Boundary
- Wilderness Study Area
- Lake/Reservoir

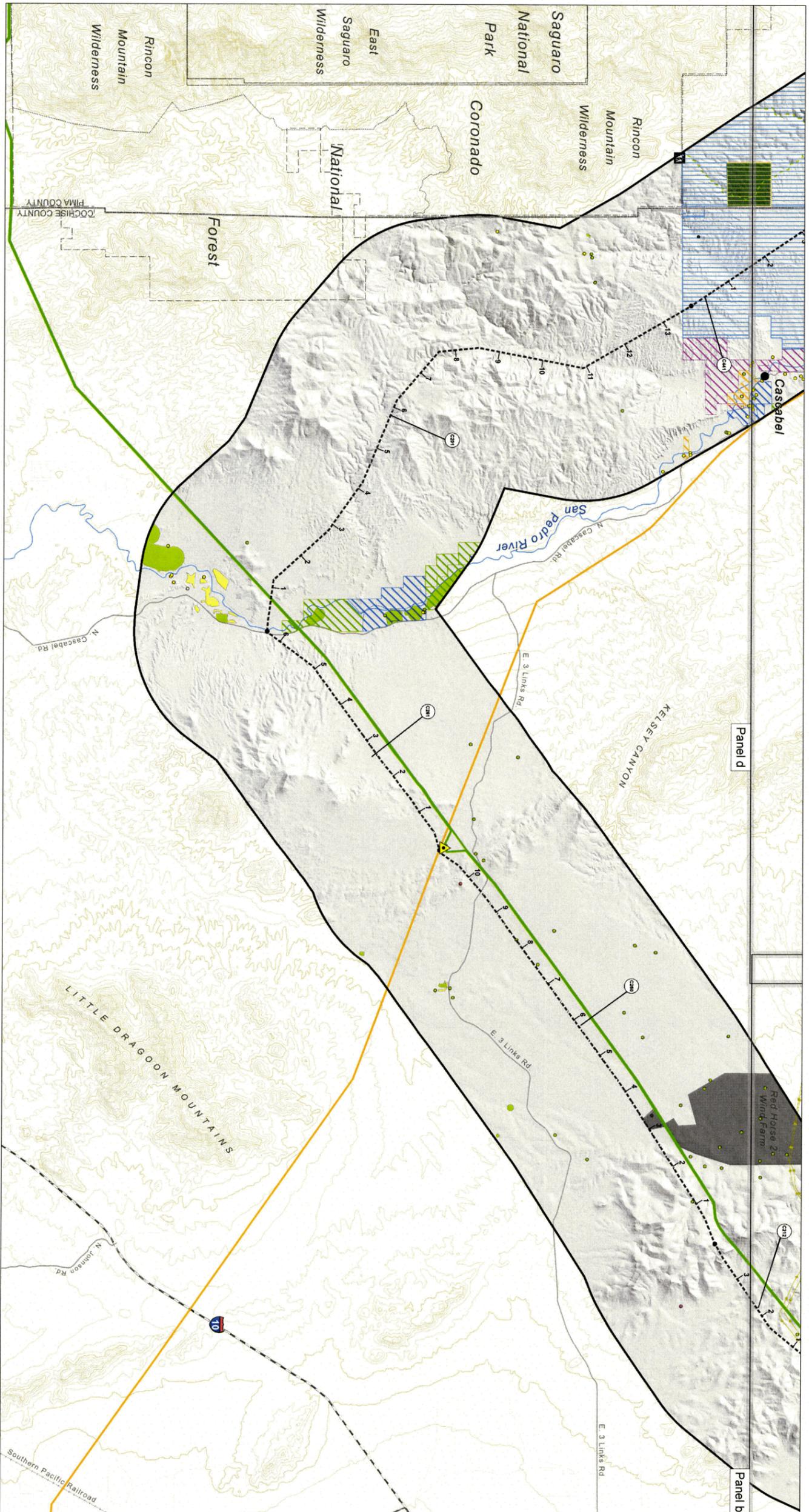
**Project Features**

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- Link Node
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- Link Identifier

**Sources**

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- Arizona State Land Department and ALRIS, 2010
- Pima County, 2010
- The Nature Conservancy, 2010
- ESRI StreetMap, 2013
- USGS, 2015





**Existing Land Use**

- Agriculture
- Air Facilities
- Commercial
- Communication Facilities
- Industrial
- Parks/Preservation
- Public/Quasi-Public
- Recreation
- Residential
- School/Educational Facilities
- Utilities
- Scenic/Historic Road
- Arizona National Scenic Trail
- Recreation Trail
- Trailhead

- BLM Rights of Way
- Avoidance Area
- Exclusion Area
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- 230 KV Transmission Line
- 138 KV Transmission Line
- Future 230 KV Transmission Line (Permitted)
- Pipeline
- Canal

**Utilities**

- City/Town
- Interstate
- Highway
- Local Road
- Railroad
- River/Stream
- State Boundary
- County Boundary
- City/Town Boundary
- Jurisdictional Boundary
- Wilderness/ Wilderness Study Area
- Lake/Reservoir

- Milepost Identifier
- Proposed Route
- Link Node
- Study Corridor
- Link Identifier

- City/Town
- Interstate
- Highway
- Local Road
- Railroad
- River/Stream
- State Boundary
- County Boundary
- City/Town Boundary
- Jurisdictional Boundary
- Wilderness/ Wilderness Study Area
- Lake/Reservoir

**Reference Features**

- City/Town
- Interstate
- Highway
- Local Road
- Railroad
- River/Stream
- State Boundary
- County Boundary
- City/Town Boundary
- Jurisdictional Boundary
- Wilderness/ Wilderness Study Area
- Lake/Reservoir

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**Project Features**

- Milepost Identifier
- Proposed Route
- Link Node
- Study Corridor
- Link Identifier

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- Link Node
- Study Corridor
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**Scale**

- Scale = 1:62,500
- Contour Interval = 100 Feet

- Scale = 1:62,500
- Contour Interval = 100 Feet

- Scale = 1:62,500
- Contour Interval = 100 Feet

**Legend**

- City/Town
- Interstate
- Highway
- Local Road
- Railroad
- River/Stream
- State Boundary
- County Boundary
- City/Town Boundary
- Jurisdictional Boundary
- Wilderness/ Wilderness Study Area
- Lake/Reservoir

- City/Town
- Interstate
- Highway
- Local Road
- Railroad
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- Jurisdictional Boundary
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- Lake/Reservoir

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- Highway
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- City/Town Boundary
- Jurisdictional Boundary
- Wilderness/ Wilderness Study Area
- Lake/Reservoir

**Map Information**

- Map Title: SUNZIA SOUTHWEST TRANSMISSION PROJECT
- Map Scale: 1:62,500
- Map Date: 2015

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- Map Scale: 1:62,500
- Map Date: 2015

- Map Title: SUNZIA SOUTHWEST TRANSMISSION PROJECT
- Map Scale: 1:62,500
- Map Date: 2015

- Map Title: SUNZIA SOUTHWEST TRANSMISSION PROJECT
- Map Scale: 1:62,500
- Map Date: 2015

**Map Information**

- Map Title: SUNZIA SOUTHWEST TRANSMISSION PROJECT
- Map Scale: 1:62,500
- Map Date: 2015

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- Map Title: SUNZIA SOUTHWEST TRANSMISSION PROJECT
- Map Scale: 1:62,500
- Map Date: 2015

**Map Information**

- Map Title: SUNZIA SOUTHWEST TRANSMISSION PROJECT
- Map Scale: 1:62,500
- Map Date: 2015

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- Map Scale: 1:62,500
- Map Date: 2015

- Map Title: SUNZIA SOUTHWEST TRANSMISSION PROJECT
- Map Scale: 1:62,500
- Map Date: 2015

**Map Information**

- Map Title: SUNZIA SOUTHWEST TRANSMISSION PROJECT
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- Map Date: 2015

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- Map Scale: 1:62,500
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- Map Scale: 1:62,500
- Map Date: 2015

**Map Information**

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- Map Scale: 1:62,500
- Map Date: 2015

**Map Information**

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- Map Scale: 1:62,500
- Map Date: 2015

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- Map Scale: 1:62,500
- Map Date: 2015

- Map Title: SUNZIA SOUTHWEST TRANSMISSION PROJECT
- Map Scale: 1:62,500
- Map Date: 2015

**Map Information**

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- Map Date: 2015

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- Map Scale: 1:62,500
- Map Date: 2015

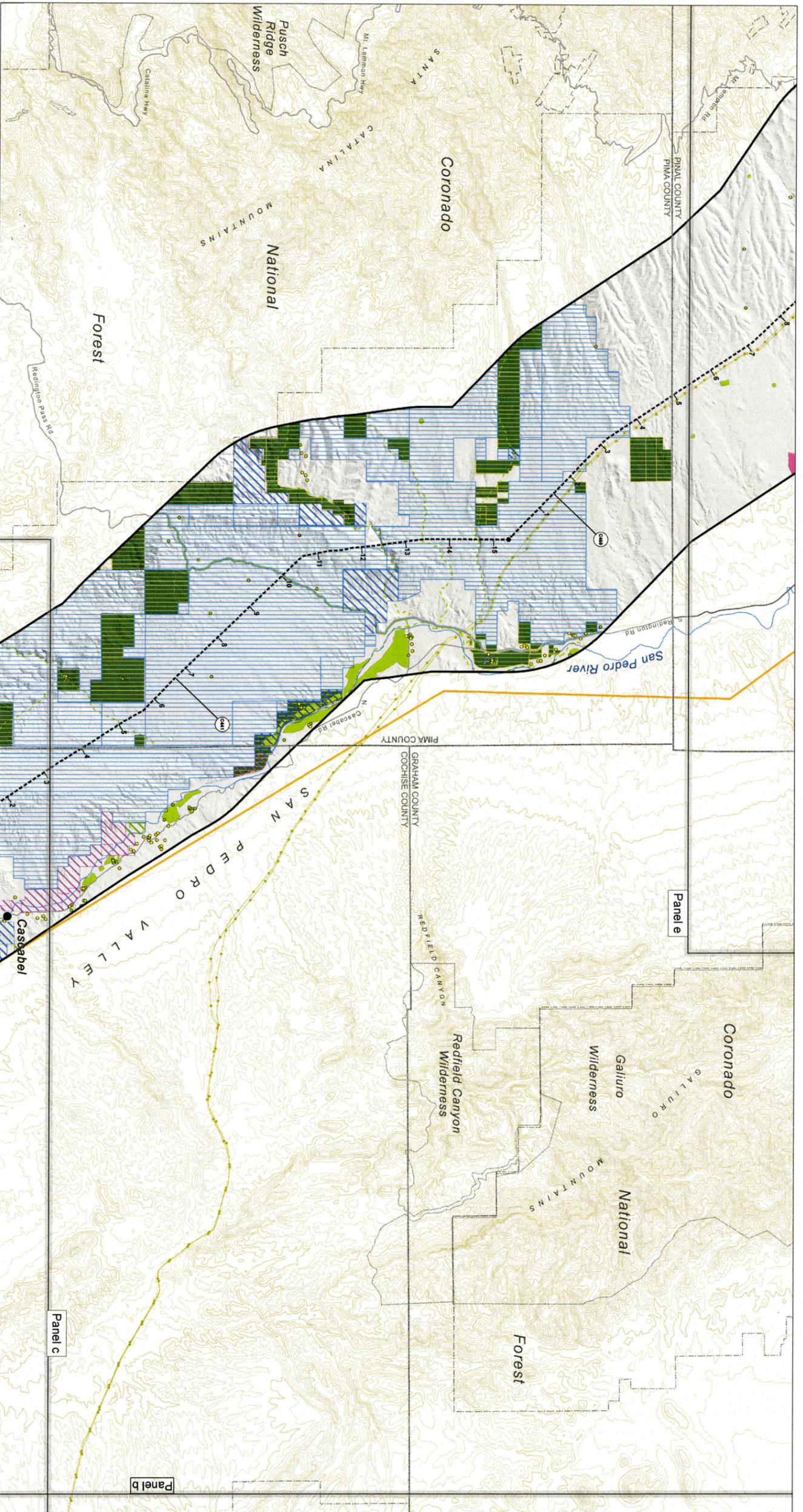


Exhibit A-2d  
**SUNZIA SOUTHWEST TRANSMISSION PROJECT**



**Existing Land Use**

- |                               |  |
|-------------------------------|--|
| Agriculture                   | BLM Rights of Way                        |
| Air Facilities                | Avoidance Area                           |
| Commercial                    | Exclusion Area                           |
| Communication Facilities      | Pima County                              |
| Industrial                    | Grazing Lease (Arizona State Trust Land) |
| Parks/Preservation            | Conservation/Preservation (county owned) |
| Public/Quasi-Public           | The Nature Conservancy                   |
| Residential                   | TNC Easement/Private Fee                 |
| School/Educational Facilities | Conservation Lands-BLM                   |
| Utilities                     | Private-Full Fee                         |
| Scenic/Historic Road          | Forest Legacy Fee                        |
| Arizona National Scenic Trail | Forest Legacy Parcels                    |
| Recreation Trail              |  |
| Trailhead                     |  |

**Utilities**

- |   |
|---|
| Existing Substation                           |
| Proposed Willow 500 KV Substation             |
| Proposed 500 KV DC Converter Station (option) |
| 500 KV Transmission Line                      |
| 345 KV Transmission Line                      |
| 230 KV Transmission Line                      |
| 138 KV Transmission Line                      |
| 115 KV Transmission Line                      |
| Future 230 KV Transmission Line (Permitted)   |
| Pipeline                                      |
| Canal   |

**Reference Features**

- |                                  |
|----------------------------------|
| City/Town                        |
| Interstate                       |
| Highway                          |
| Local Road                       |
| Railroad                         |
| River/Stream                     |
| State Boundary                   |
| County Boundary                  |
| City/Town Boundary               |
| Jurisdictional Boundary          |
| Wilderness/Wilderness Study Area |
| Lake/Reservoir                   |

**Project Features**

- |                     |
|---------------------|
| Milepost Identifier |
| Proposed Route      |
| Critterline         |
| Link Node           |
| Study Corridor      |
| Link Identifier     |

**Sources**

- Bureau of Land Management, Arizona State Office, 2010
- Arizona State Land Department and ALRIS, 2010
- The Nature Conservancy, 2010
- Pima County, 2015
- ESRI StreetMap, 2013
- USGS, 2015



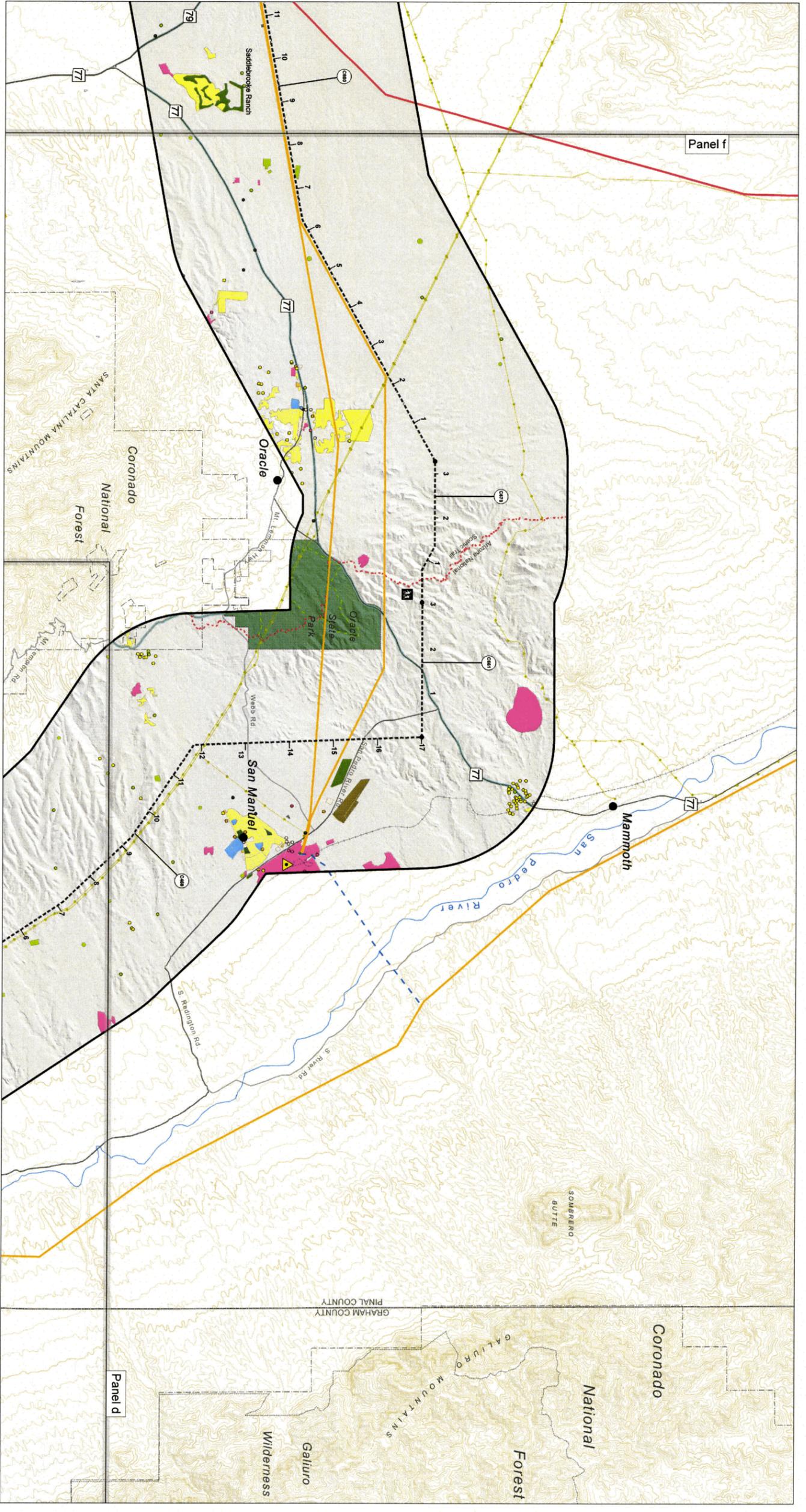


Exhibit A-2e  
**Existing Land Use**  
**SUNZIA SOUTHWEST TRANSMISSION PROJECT**



**Existing Land Use**

- Agriculture
- Air Facilities
- Commercial
- Communication Facilities
- Industrial
- Parks/Preservation
- Public/Quasi-Public
- Recreation
- Residential
- School/Educational Facilities
- Utilities
- Scenic/Historic Road
- Arizona National Scenic Trail
- Recreation Trail
- Trailhead

**Utilities**

- Existing Substation
- Proposed Willow 500 KV Substation
- Proposed 500 KV DC Converter Station (option)
- 500 KV Transmission Line
- 345 KV Transmission Line
- 230 KV Transmission Line
- 138 KV Transmission Line
- Future 230 KV Transmission Line (Permitted)
- Pipeline
- Canal

**Reference Features**

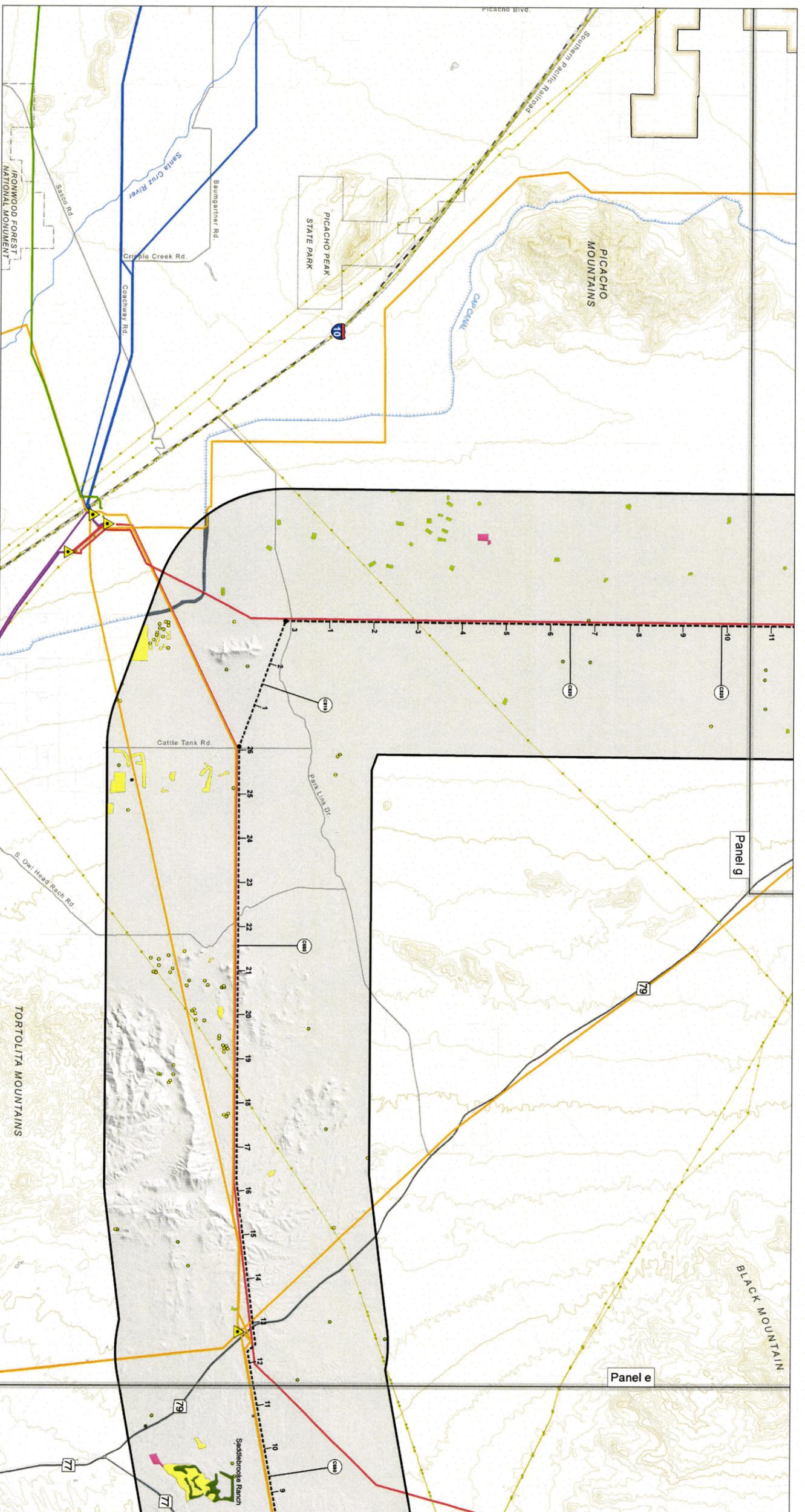
- City/Town
- Interstate
- Highway
- Local Road
- Railroad
- River/Stream
- State Boundary
- County Boundary
- City/Town Boundary
- Jurisdictional Boundary
- Wilderness/ Wilderness Study Area
- Lake/Reservoir

**Project Features**

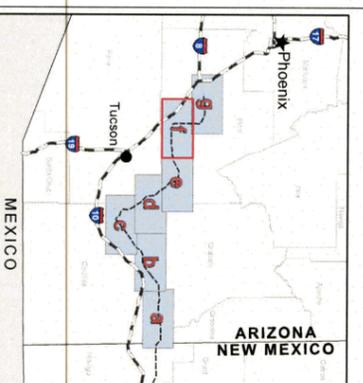
- Milepost Identifier
- Proposed Route
- Link Node
- Study Corridor
- Link Identifier

**Sources**

- Bureau of Land Management, Arizona State Office, 2010
- Arizona State Land Department and ARLIS, 2010
- The Nature Conservancy, 2010
- Pima County, 2010
- ESRI, StreetMap, 2013
- USGS, 2015



**Exhibit A-2f**  
**SUNZIA SOUTHWEST TRANSMISSION PROJECT**



**Existing Land Use**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li> Agriculture</li> <li> Air Facilities</li> <li> Commercial</li> <li> Communication Facilities</li> <li> Industrial</li> <li> Parks/Preservation</li> <li> Public/Quasi-Public</li> <li> Recreation</li> <li> Residential</li> <li> School/Educational Facilities</li> <li> Utilities</li> <li> Scenic/Historic Road</li> <li> Arizona National Scenic Trail</li> <li> Recreation Trail</li> <li> Trailhead</li> </ul> | <ul style="list-style-type: none"> <li> BLM Rights of Way</li> <li> Avoidance Area</li> <li> Exclusion Area</li> <li> Pima County</li> <li> Grazing Lease (Arizona State Trust Land)</li> <li> Conservation/Preservation (county owned)</li> </ul> |
|--|--|

**Utilities**

- Existing Substation
- Proposed Willow 500 KV Substation
- Proposed 500 KV/DC Converter Station (option)
- 500 KV Transmission Line
- 345 KV Transmission Line
- 230 KV Transmission Line
- 138 KV Transmission Line
- 115 KV Transmission Line
- Future 230 KV Transmission Line (Permitted)
- Pipeline
- Canal

**Reference Features**

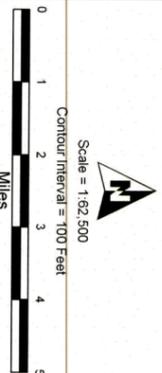
- City/Town
- Interstate
- Highway
- Local Road
- Railroad
- River/Stream
- State Boundary
- County Boundary
- City/Town Boundary
- Jurisdictional Boundary
- Wilderness/Wilderness Study Area
- Lake/Reservoir

**Project Features**

- Milepost Identifier
- Proposed Route
- Critterline
- Link Node
- Study Corridor
- Link Identifier

**Sources**

- Bureau of Land Management, Arizona State Office, 2010
- Arizona State Land Department and ALRIS, 2010
- Pima County, 2010
- The Nature Conservancy, 2010
- ESRI StreetMap, 2013
- USGS, 2015



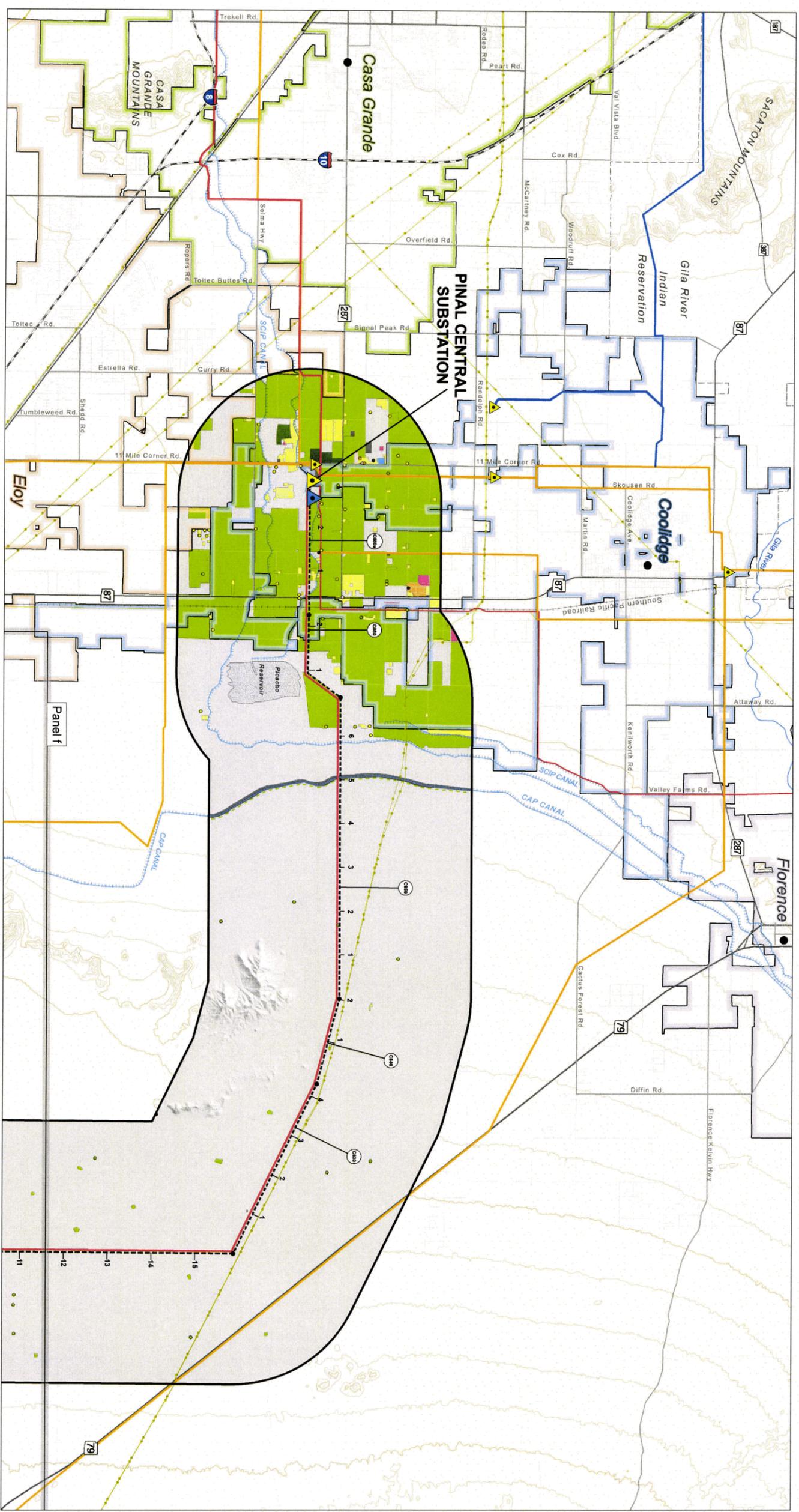


Exhibit A-29  
**Existing Land Use**  
**SUNZIA SOUTHWEST TRANSMISSION PROJECT**



**Existing Land Use**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li> Agriculture</li> <li> Air Facilities</li> <li> Commercial</li> <li> Communication Facilities</li> <li> Industrial</li> <li> Parks/Preservation</li> <li> Public/Quasi-Public</li> <li> Recreation</li> <li> Residential</li> <li> School/Educational Facilities</li> <li> Utilities</li> <li> Scenic/Historic Road</li> <li> Arizona National Scenic Trail</li> <li> Recreation Trail</li> <li> Trailhead</li> </ul> | <ul style="list-style-type: none"> <li> BLM Rights of Way</li> <li> Avoidance Area</li> <li> Exclusion Area</li> <li> Pima County</li> <li> Grazing Lease (Arizona State Trust Land)</li> <li> Conservation/Preservation (county owned)</li> <li> The Nature Conservancy</li> <li> TNC Easement/Private Fee</li> <li> Conservation Lands-BLM</li> <li> Private-Full Fee</li> <li> Forest Legacy Parcels</li> </ul> |
|--|--|

**Utilities**

- Existing Substation
- Proposed Willow
- 500 KV Substation
- Proposed 500 KV DC Converter Station (option)
- 500 KV Transmission Line
- 345 KV Transmission Line
- 230 KV Transmission Line
- 138 KV Transmission Line
- 115 KV Transmission Line
- Future 230 KV Transmission Line (Permitted)
- Pipeline
- Canal

**Reference Features**

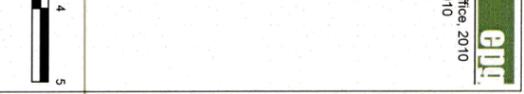
- City/Town
- Interstate
- Highway
- Local Road
- Railroad
- River/Stream
- State Boundary
- County Boundary
- City/Town Boundary
- Jurisdictional Boundary
- Wilderness/Wilderness Study Area
- Lake/Reservoir

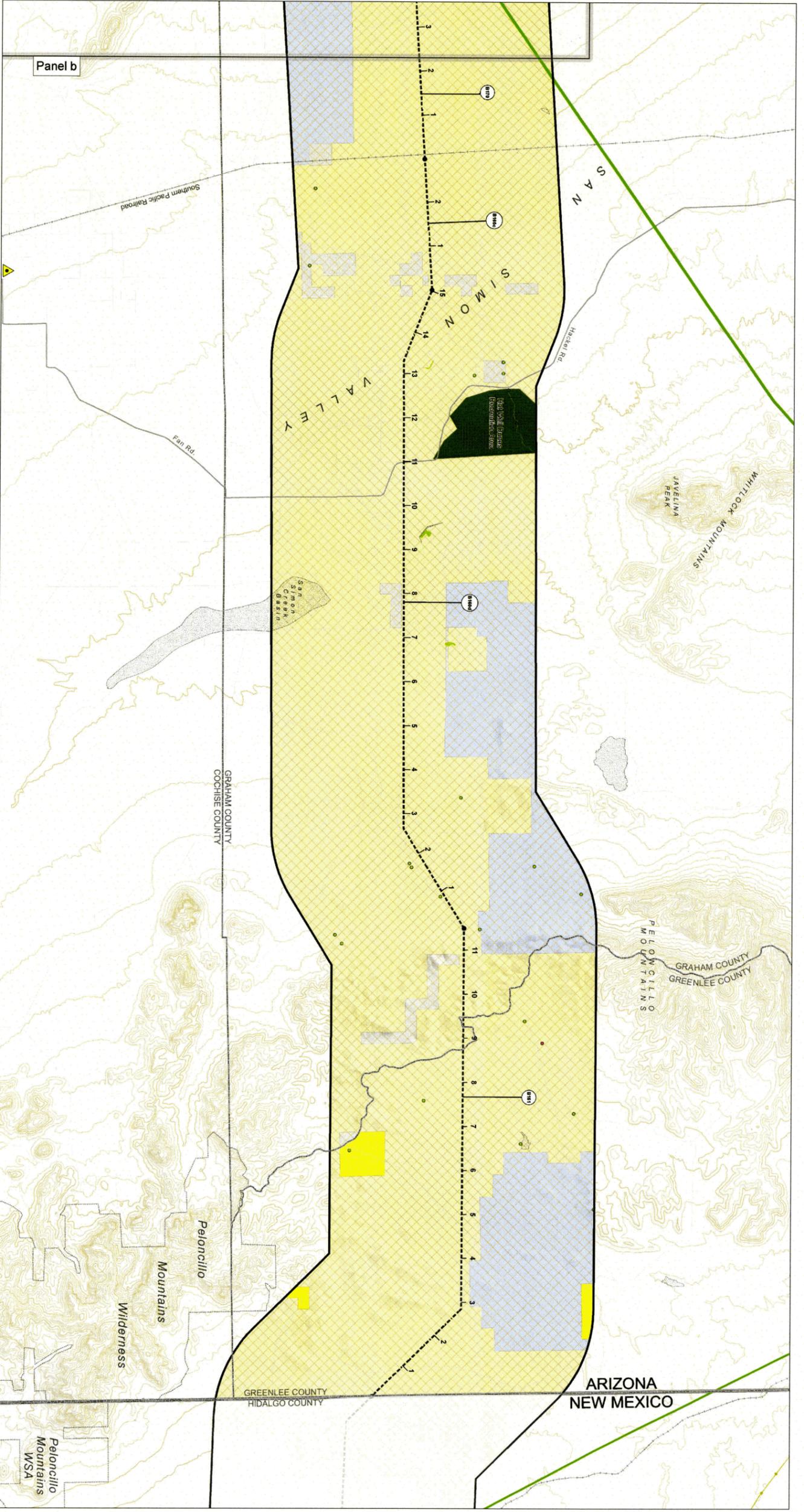
**Project Features**

- Milepost Identifier
- Proposed Route
- Centerline
- Link Node
- Study Corridor
- Link Identifier

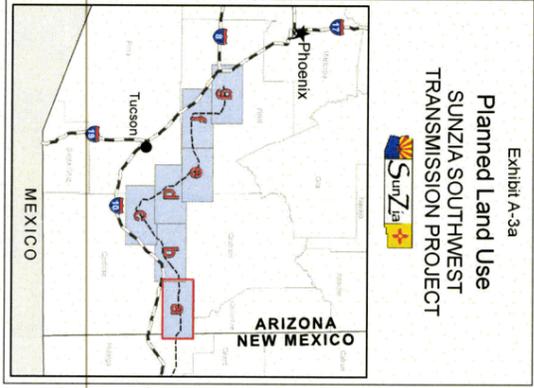
**Sources**

- Bureau of Land Management, Arizona State Office, 2010
- Arizona State Land Department and ALRIS, 2010
- Pima County, 2010
- The Nature Conservancy, 2010
- ESRI StreetMap, 2013
- USGS, 2015





Panel b

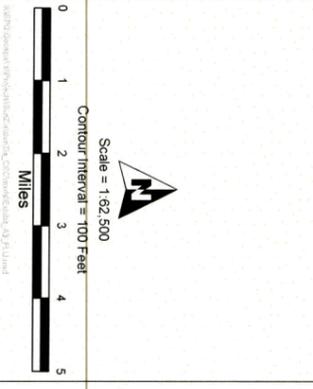


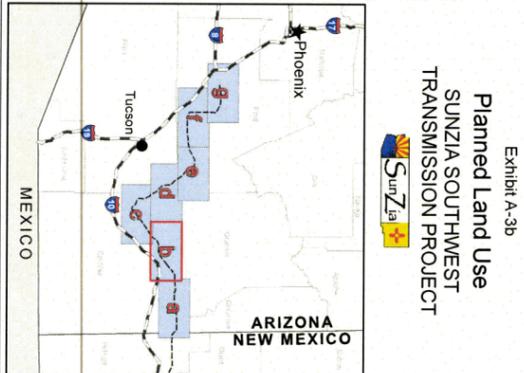
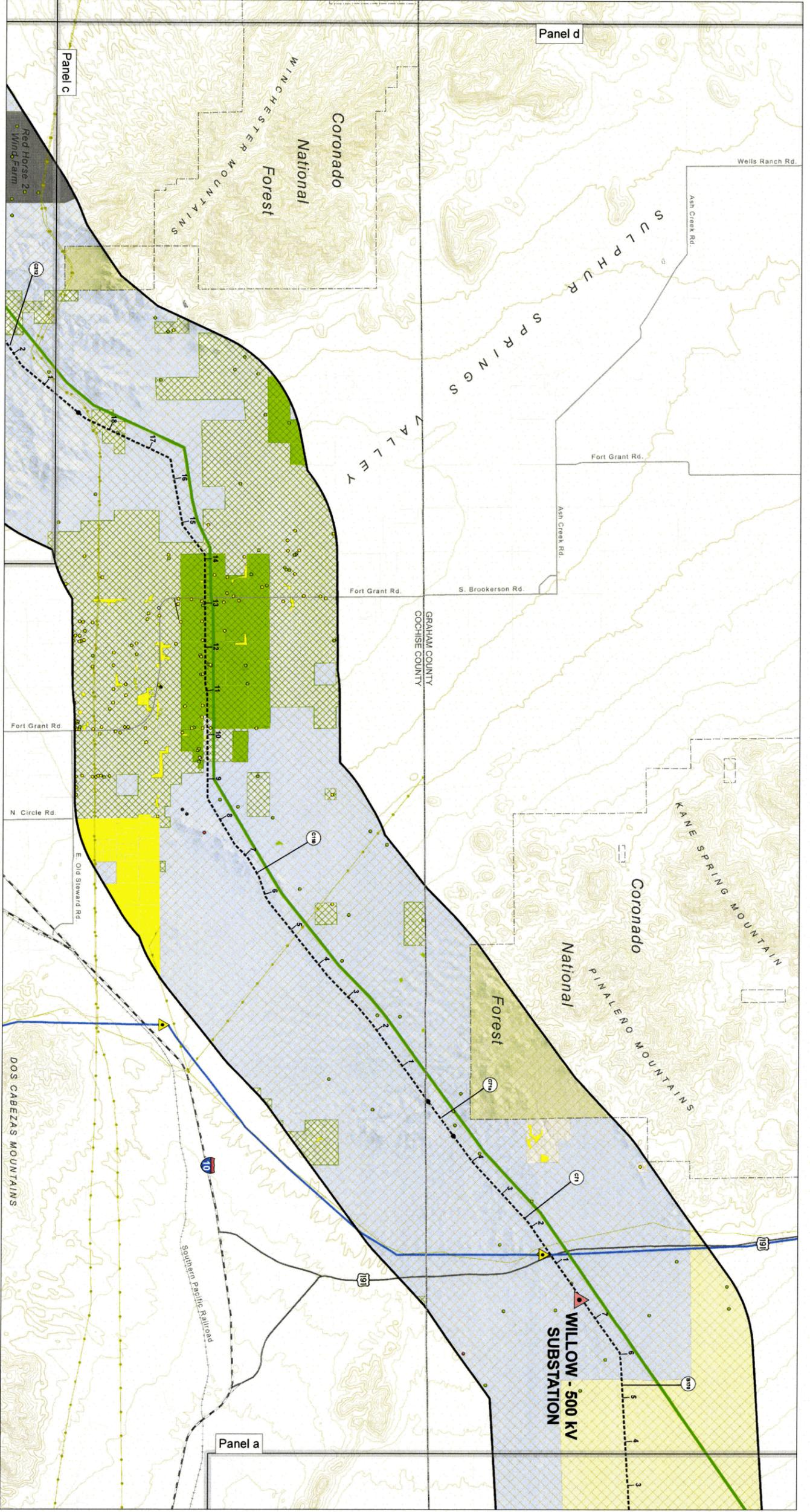
**Planned Land Use**

- |   |   |  |
|---|---|--|
| <ul style="list-style-type: none"> <li> Agriculture</li> <li> Air Facilities</li> <li> Commercial</li> <li> Communication Facilities</li> <li> Industrial</li> <li> Parks/Preservation</li> <li> Public/Quasi-Public</li> <li> Recreation</li> <li> Residential</li> <li> School/Educational Facilities</li> <li> Utilities</li> </ul>  | <ul style="list-style-type: none"> <li> Avoidance Area</li> <li> Exclusion Area</li> <li> Pinal County Proposed Regional Park/Open Space</li> <li> Proposed Regional Park/Proposed Trail</li> <li> Pima County/San Pedro Planning Area</li> <li> Low Intensity Rural</li> <li> Resource Conservation</li> <li> Grazing Lease - Arizona State Trust</li> <li> Land (Cochise County)</li> </ul> | <ul style="list-style-type: none"> <li> The Nature Conservancy</li> <li> TNC Easement-Private Fee</li> <li> Conservation Lands-BLM</li> <li> Private-Full Fee</li> <li> Forest Legacy Parcels</li> <li> Bureau of Land Management</li> <li> U.S. Forest Service</li> <li> Arizona State Trust Land</li> <li> Private/Other</li> <li> Low-Density Residential/Rural (Cochise County)</li> </ul> |
| <ul style="list-style-type: none"> <li> Existing Substation</li> <li> Proposed Willow</li> <li> 500 kV Substation</li> <li> Proposed 500 kV D/C</li> <li> Converter Station (option)</li> <li> 500 kV Transmission Line</li> <li> 345 kV Transmission Line</li> <li> 230 kV Transmission Line</li> <li> 138 kV Transmission Line</li> <li> 115 kV Transmission Line</li> <li> Future 230 kV Transmission Line (Permitted)</li> <li> Pipeline</li> <li> Canal</li> </ul> | <ul style="list-style-type: none"> <li> Arizona National Scenic Trail</li> <li> Recreation Trail</li> <li> Trailhead</li> </ul>   | <ul style="list-style-type: none"> <li> City/Town</li> <li> Interstate</li> <li> Highway</li> <li> Local Road</li> <li> Railroad</li> <li> River/Stream</li> </ul>   |
| <ul style="list-style-type: none"> <li> Milepost Identifier</li> <li> Proposed Route</li> <li> Centrilite</li> <li> Link Node</li> <li> Study Corridor</li> <li> Link Identifier</li> </ul>   | <ul style="list-style-type: none"> <li> State Boundary</li> <li> County Boundary</li> <li> City/Town Boundary</li> <li> Jurisdictional Boundary</li> <li> Wilderness</li> <li> Wilderness Study Area</li> <li> Lake/Reservoir</li> </ul>  | <p><b>Reference Features</b></p>   |

**Sources**

- Bureau of Land Management, Arizona State Office, 2010
- Arizona State Land Department and A/LRIS, 2010
- The Nature Conservancy, 2010
- City of Coolidge, 2015
- City of Eloy, 2015
- Pima County, 2015
- ESRI StreetMap 2013
- USGS, 2015





**Exhibit A-3b**  
**SUNZLIA SOUTHWEST TRANSMISSION PROJECT**

**Planned Land Use**

- Agriculture
- Air Facilities
- Commercial
- Communication Facilities
- Industrial
- Parks/Preservation
- Public/Quasi-Public
- Recreation
- Residential
- School/Educational Facilities
- Utilities
- Scenic/Historic Road
- Arizona National Scenic Trail
- Recreation Trail
- Trailhead

**BLM Rights of Way**

- Avoidance Area
- Exclusion Area
- Pinal County Proposed Regional Park/Open Space
- Proposed Trail
- Pima County/San Pedro Planning Area
- Low Intensity Rural
- Resource Conservation
- Grazing Lease - Arizona State Trust Land (Cochise County)

**The Nature Conservancy**

- TNC Easement/Private Fee
- Conservation Lands-BLM
- Private-Full Fee
- Forest Legacy Parcels
- Grazing/Multi-Use/Vacant
- Bureau of Land Management
- U.S. Forest Service
- Arizona State Trust Land
- Private/Other
- Low-Density Residential/Rural (Cochise County)

**Utilities**

- Existing Substation
- Proposed Willow
- 500 KV Substation
- Proposed 500 KV DC Converter Station (option)
- 500 KV Transmission Line
- 345 KV Transmission Line
- 230 KV Transmission Line
- 138 KV Transmission Line
- 115 KV Transmission Line
- Future 230 KV Transmission Line (Permitted)
- Pipeline
- Canal

**Project Features**

- Milepost Identifier
- Proposed Route
- Centerline
- Link Node
- Study Corridor
- Link Identifier

**Reference Features**

- City/Town
- Interstate
- Highway
- Local Road
- Railroad
- River/Stream
- State Boundary
- County Boundary
- City/Town Boundary
- Jurisdictional Boundary
- Wilderness/ Wilderness Study Area
- Lake/Reservoir

**Sources**

- Bureau of Land Management, Arizona State Office, 2010
- Arizona State Land Department and A.L.R.I.S., 2010
- The Nature Conservancy, 2010
- City of Coolidge, 2015
- City of Eloy, 2015
- Pima County, 2015
- ESRI, StreetMap, 2013
- USGS, 2015

**Scale = 1:62,500**  
 Contour Interval = 100 Feet

**gnj**

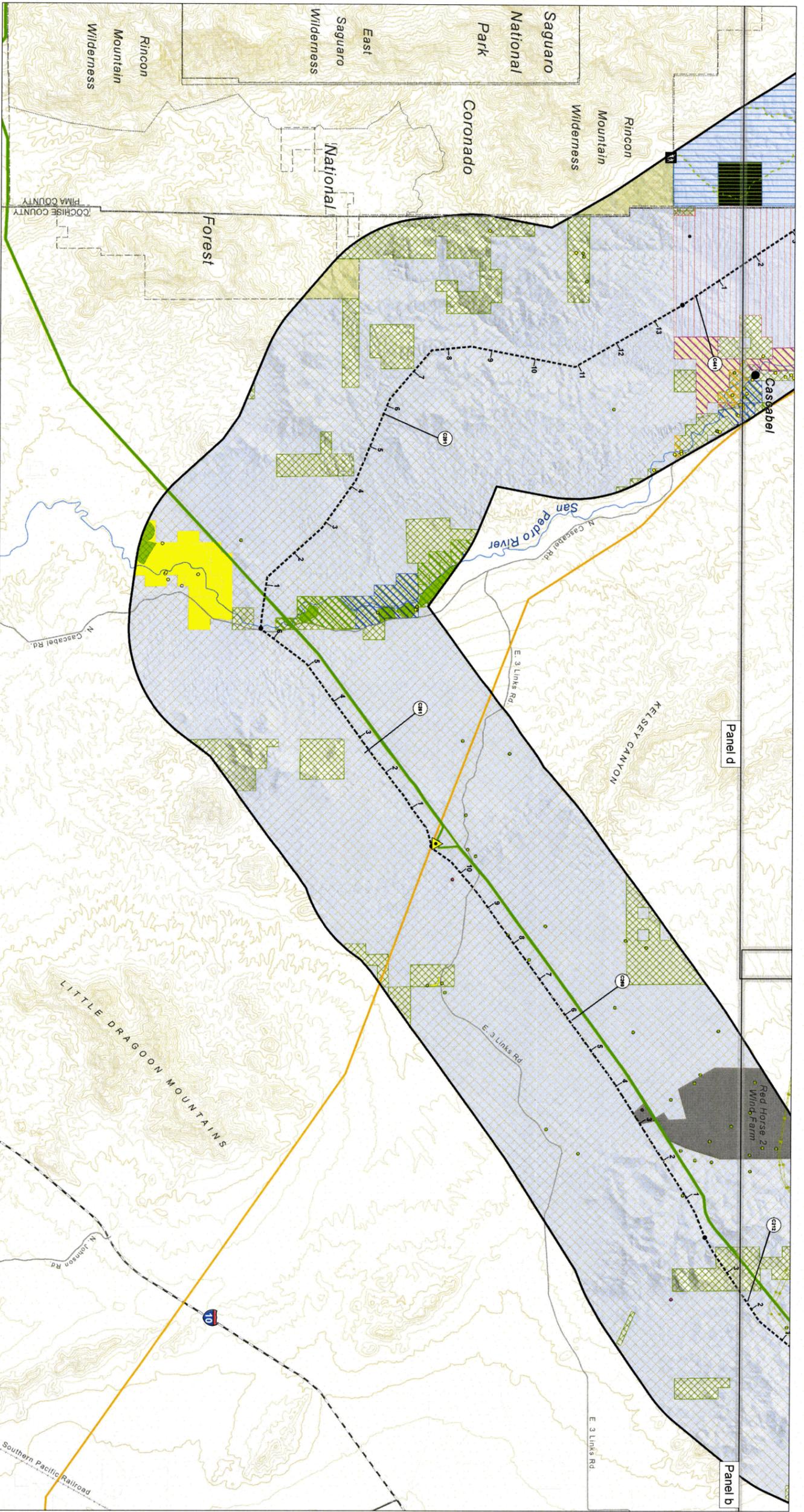
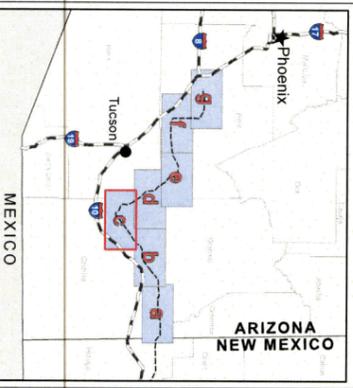


Exhibit A-3c

**SUNZIA SOUTHWEST TRANSMISSION PROJECT**



**Planned Land Use**

- |  |  |   |
|--|--|---|
| <ul style="list-style-type: none"> <li> Agriculture</li> <li> Air Facilities</li> <li> Commercial</li> <li> Communication Facilities</li> <li> Industrial</li> <li> Parks/Preservation</li> <li> Public/Quasi-Public</li> <li> Recreation</li> <li> Residential</li> <li> School/Educational Facilities</li> <li> Utilities</li> <li> Scenic/Historic Road</li> <li> Arizona National Scenic Trail</li> <li> Recreation Trail</li> <li> Trailhead</li> </ul> | <ul style="list-style-type: none"> <li> BLM Rights of Way</li> <li> Avoidance Area</li> <li> Exclusion Area</li> <li> Pinal County</li> <li> Proposed Regional Park/Open Space</li> <li> Proposed Trail</li> <li> Pima County/San Pedro Planning Area</li> <li> Low Intensity Rural</li> <li> Resource Conservation</li> <li> Grazing Lease - Arizona State Trust Land (Cochise County)</li> </ul> | <ul style="list-style-type: none"> <li> The Nature Conservancy</li> <li> TNC Easement-Private Fee</li> <li> Conservation Lands-BLM</li> <li> Private-Full Fee</li> <li> Forest Legacy Parcels</li> <li> Grazing/Multi-Use/Vacant</li> <li> Bureau of Land Management</li> <li> U.S. Forest Service</li> <li> Arizona State Trust Land</li> <li> Private/Other</li> <li> Low-Density Residential/Rural (Cochise County)</li> </ul> |
|--|--|---|

**Utilities**

- Existing Substation
- Proposed W/low 500 KV Substation
- Proposed 500 KV DC Converter Station (option)
- 500 KV Transmission Line
- 345 KV Transmission Line
- 230 KV Transmission Line
- 138 KV Transmission Line
- 115 KV Transmission Line
- Future 230 KV Transmission Line (Permitted)
- Pipeline
- Canal

**Project Features**

- |  |   |  |
|--|---|--|
| <ul style="list-style-type: none"> <li> City/Town</li> <li> Interstate</li> <li> Highway</li> <li> Local Road</li> <li> Railroad</li> <li> River/Stream</li> </ul> | <ul style="list-style-type: none"> <li> Milepost Identifier</li> <li> Proposed Route</li> <li> Centerline</li> <li> Link Node</li> <li> Study Corridor</li> <li> Link Identifier</li> </ul> | <ul style="list-style-type: none"> <li> State Boundary</li> <li> County Boundary</li> <li> City/Town Boundary</li> <li> Jurisdictional Boundary</li> <li> Wilderness/Wilderness Study Area</li> <li> Lake/Reservoir</li> </ul> |
|--|---|--|

**Sources**

- Bureau of Land Management, Arizona State Office, 2010
- Arizona State Land Department and ALRIS, 2010
- The Nature Conservancy, 2010
- City of Coolidge, 2015
- City of Eloy, 2015
- Pima County, 2015
- ESRI, StreetMap, 2013
- USGS, 2015



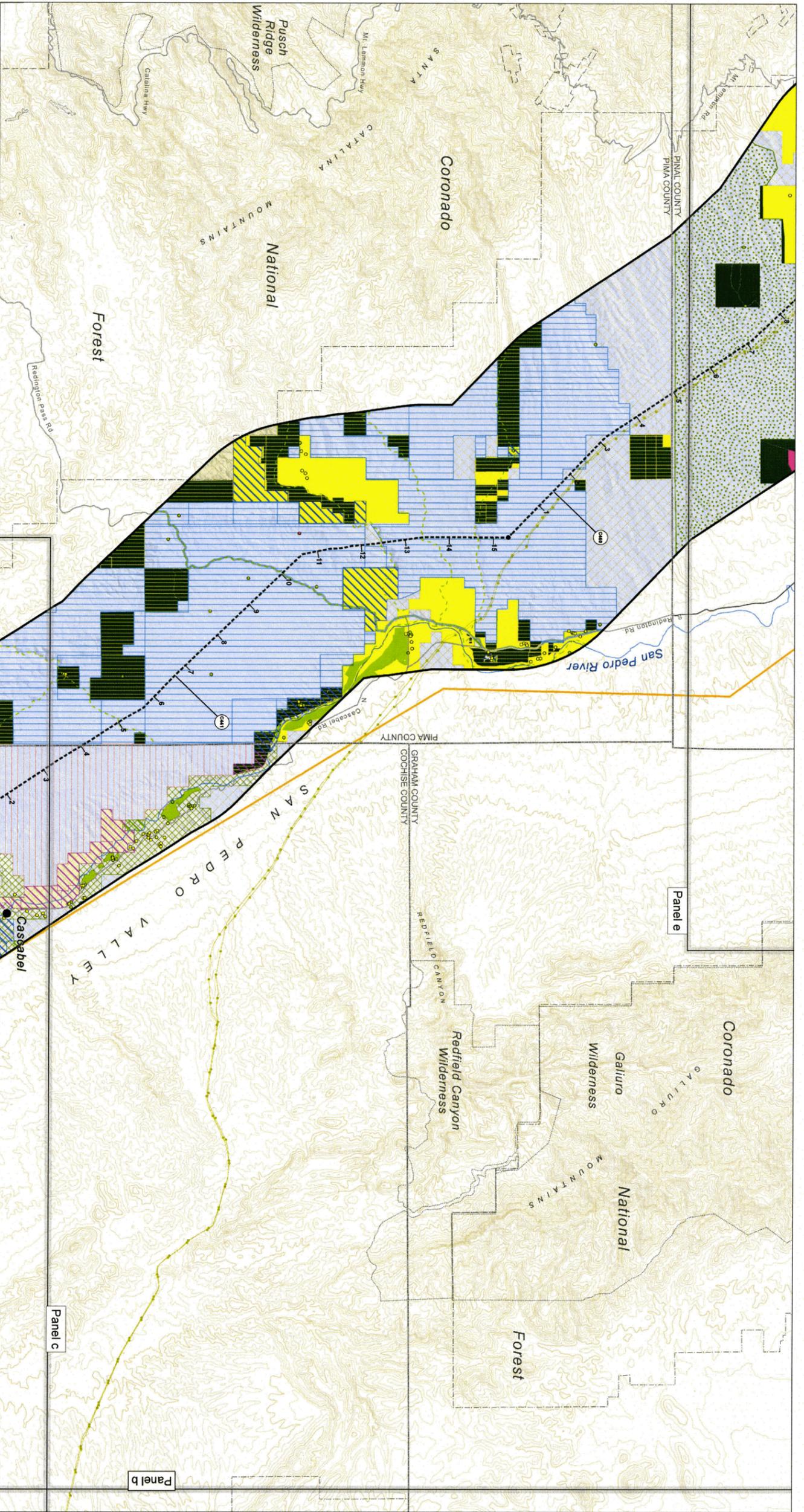
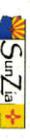


Exhibit A-3d

**SUNZIA SOUTHWEST TRANSMISSION PROJECT**



**Planned Land Use**

- Agriculture
- Air Facilities
- Commercial
- Communication Facilities
- Industrial
- Parks/Preservation
- Public/Quasi-Public
- Recreation
- Residential
- School/Educational Facilities
- Utilities
- Scenic/Historic Road
- Arizona National Scenic Trail
- Recreation Trail
- Trailhead

**BLM Rights of Way**

- Avoidance Area
- Exclusion Area
- Pinal County Proposed Regional Park/Open Space
- Pinal County Proposed Trail
- Pima County/San Pedro Planning Area
- Low Intensity Rural
- Resource Conservation
- Grazing Lease - Arizona State Trust Land (Cochise County)

**The Nature Conservancy**

- TNC Easement-Private Fee
- Conservation Lands-BLM
- Private-Full Fee
- Forest Legacy Parcels
- Grazing/Multi-Use/Vacant
- Bureau of Land Management
- U.S. Forest Service
- Arizona State Trust Land
- Private/Other
- Low-Density Residential/Rural (Cochise County)

**Utilities**

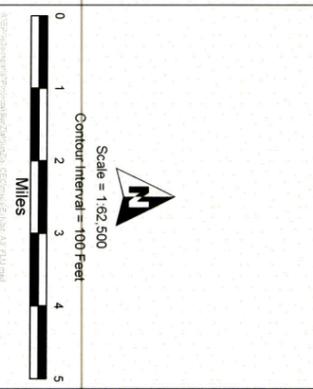
- Existing Substation
- Proposed Substation
- 500 kV Substation
- Proposed 500 kV DC Converter Station (option)
- 500 kV Transmission Line
- 345 kV Transmission Line
- 230 kV Transmission Line
- 138 kV Transmission Line
- 115 kV Transmission Line
- Future 230 kV Transmission Line (Permitted)
- Pipeline
- Canal

**Project Features**

- Milepost Identifier
- Proposed Route
- Centerline
- Link Node
- Study Corridor
- Link Identifier
- State Boundary
- County Boundary
- City/Town Boundary
- Jurisdictional Boundary
- Wilderness/Wilderness Study Area
- Lake/Reservoir
- City/Town
- Interstate
- Highway
- Local Road
- Railroad
- River/Stream

**Sources**

- Bureau of Land Management, Arizona State Office, 2010
- Arizona State Land Department and ALRIS, 2010
- The Nature Conservancy, 2010
- City of Coolidge, 2015
- City of Eloy, 2015
- Pima County, 2015
- ESRI StreetMap, 2013
- USGS, 2015





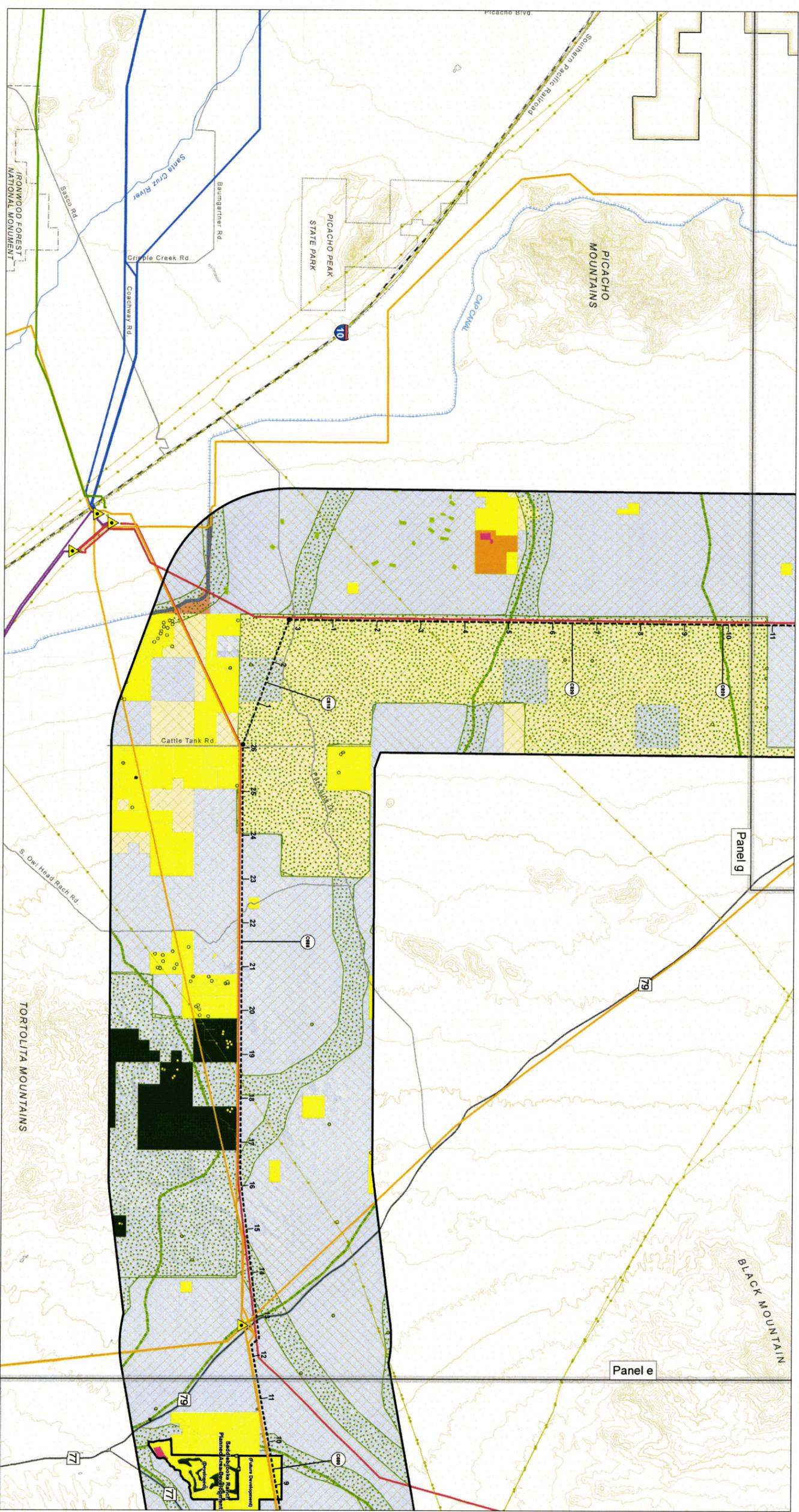


Exhibit A-3f

**SUNZIA SOUTHWEST TRANSMISSION PROJECT**



**Planned Land Use**

- Agriculture
- Air Facilities
- Commercial
- Communication Facilities
- Industrial
- Parks/Preservation
- Public/Quasi-Public
- Recreation
- Residential
- School/Educational Facilities
- Utilities
- Scenic/Historic Road
- Arizona National Scenic Trail
- Recreation Trail
- Trailhead

**BLM Rights of Way**

- Avoidance Area
- Exclusion Area
- Pinal County Proposed Regional Park/Open Space
- Proposed Trail
- Pima County/San Pedro Planning Area
- Low Intensity Rural
- Resource Conservation
- Grazing Lease - Arizona State Trust Land (Cochise County)

**The Nature Conservancy**

- TNC Easement/Private Fee
- Conservation Lands-BLM
- Private-Full Fee
- Forest Legacy Parcels
- Grazing/Multi-Use/Vacant
- Bureau of Land Management
- U.S. Forest Service
- Arizona State Trust Land
- Private/Other
- Low-Density Residential/Rural (Cochise County)

**Utilities**

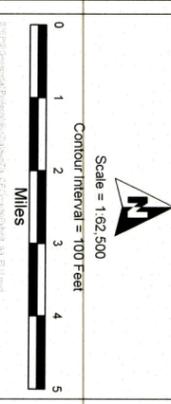
- Existing Substation
- Proposed Willow
- 500 kV Substation
- Proposed 500 kV DC Converter Station (option)
- 500 kV Transmission Line
- 345 kV Transmission Line
- 230 kV Transmission Line
- 138 kV Transmission Line
- 115 kV Transmission Line
- Future 230 kV Transmission Line (Permitted)
- Pipeline
- Canal

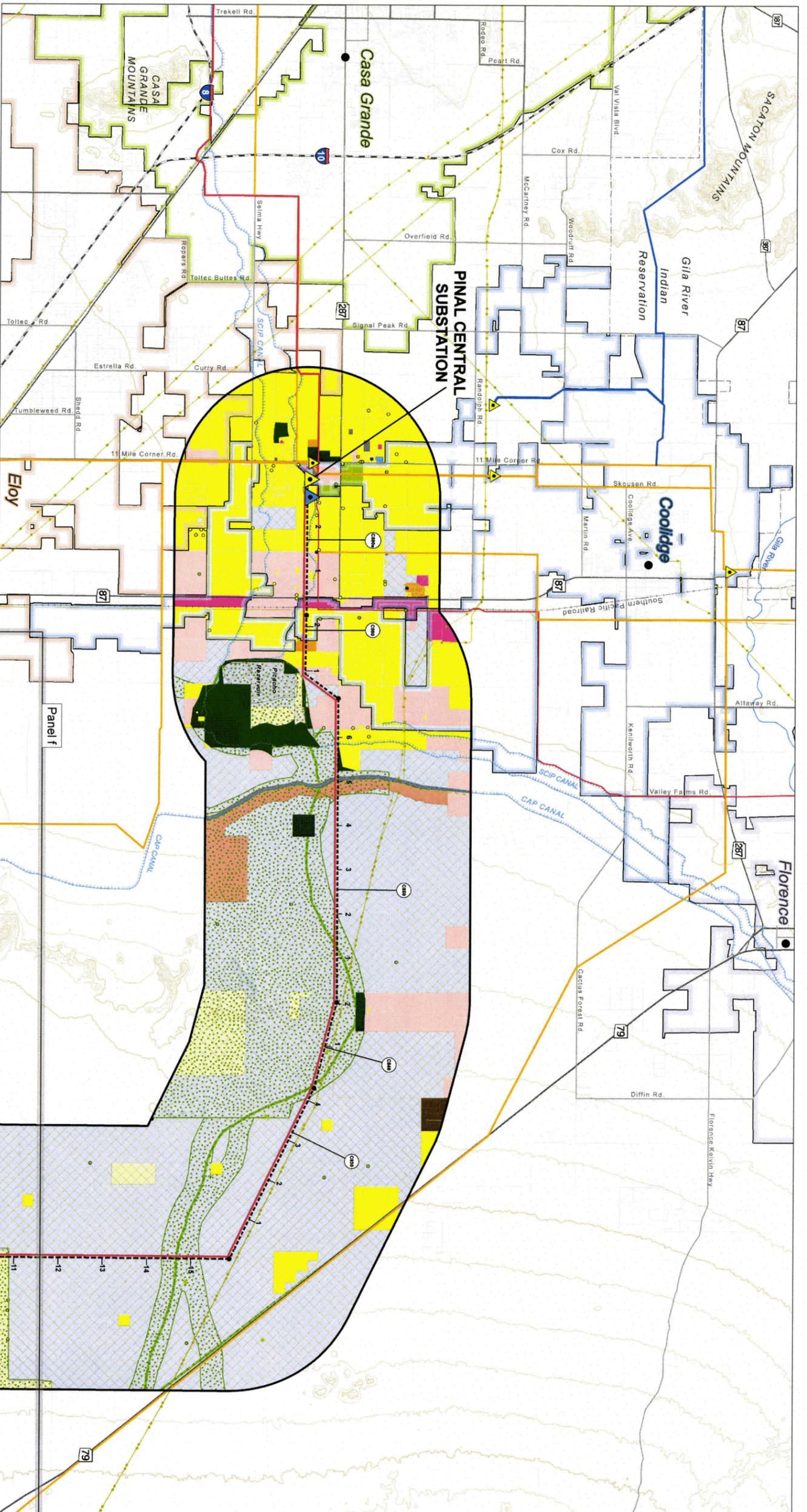
**Project Features**

- Milepost Identifier
- Proposed Route
- Centerline
- Link Node
- Study Corridor
- Link Identifier
- State Boundary
- County Boundary
- City/Town Boundary
- Jurisdictional Boundary
- Wilderness Study Area
- Lake/Reservoir

**Sources**

- Bureau of Land Management, Arizona State Office, 2010
- Arizona State Land Department and ALRIS, 2010
- The Nature Conservancy, 2010
- City of Eloy, 2015
- City of Coolidge, 2015
- Pima County, 2015
- ESRI, StreetMap, 2013
- USGS, 2015





**Exhibit A-3g**  
**Planned Land Use**  
**SUNZIA SOUTHWEST TRANSMISSION PROJECT**



- Planned Land Use**
- Agriculture
  - Air Facilities
  - Commercial
  - Communication Facilities
  - Industrial
  - Parks/Preservation
  - Public/Quasi-Public
  - Recreation
  - Residential
  - School/Educational Facilities
  - Utilities
  - Scenic/Historic Road
  - Arizona National Scenic Trail
  - Recreation Trail
  - Trailhead
- BLM Rights of Way**
- Avoidance Area
  - Exclusion Area
  - Pinal County Proposed Regional Park/Open Space/Proposed Trail
- The Nature Conservancy**
- TNC Easement-Private Fee
  - Conservation Lands-BLM
  - Private-Full Fee
  - Forest Legacy Parcels
  - Grazing/Multi-Use/Vacant
  - Bureau of Land Management
  - U.S. Forest Service
  - Arizona State Trust Land
  - Private/Other
  - Low-Density Residential/Rural (Cochise County)
- Utilities**
- Existing Substation
  - Proposed Willow
  - 500 kV Substation
  - Proposed 500 kV DC Converter Station (option)
  - 500 kV Transmission Line
  - 345 kV Transmission Line
  - 230 kV Transmission Line
  - 138 kV Transmission Line
  - 115 kV Transmission Line
  - Future 230 kV Transmission Line (Permitted)
  - Pipeline
  - Canal
- Project Features**
- Milepost Identifier
  - Proposed Route
  - Centerline
  - Link Node
  - Study Corridor
  - Link Identifier
- Reference Features**
- State Boundary
  - County Boundary
  - City/Town Boundary
  - Jurisdictional Boundary
  - Wilderness/Wilderness Study Area
  - Lake/Reservoir
  - River/Stream
  - Railroad
  - Local Road
  - Highway
  - Interstate
  - City/Town

**Sources**

- Bureau of Land Management, Arizona State Office, 2010
- Arizona State Land Department and ALRIS, 2010
- The Nature Conservancy, 2010
- City of Coolidge, 2015
- City of Eloy, 2015
- Pima County, 2015
- ESRI StreetMap, 2013
- USGS, 2015

