

NEW APPLICATION

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**Application for a Certificate of  
Environmental Compatibility**

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**Saguaro to Marana 115/138kV  
Transmission Line Project**

Prepared for:

**Arizona Power Plant and Transmission Line Siting Committee**

Submitted by:

**Arizona Electric Power Cooperative, Inc.**

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## INTRODUCTION

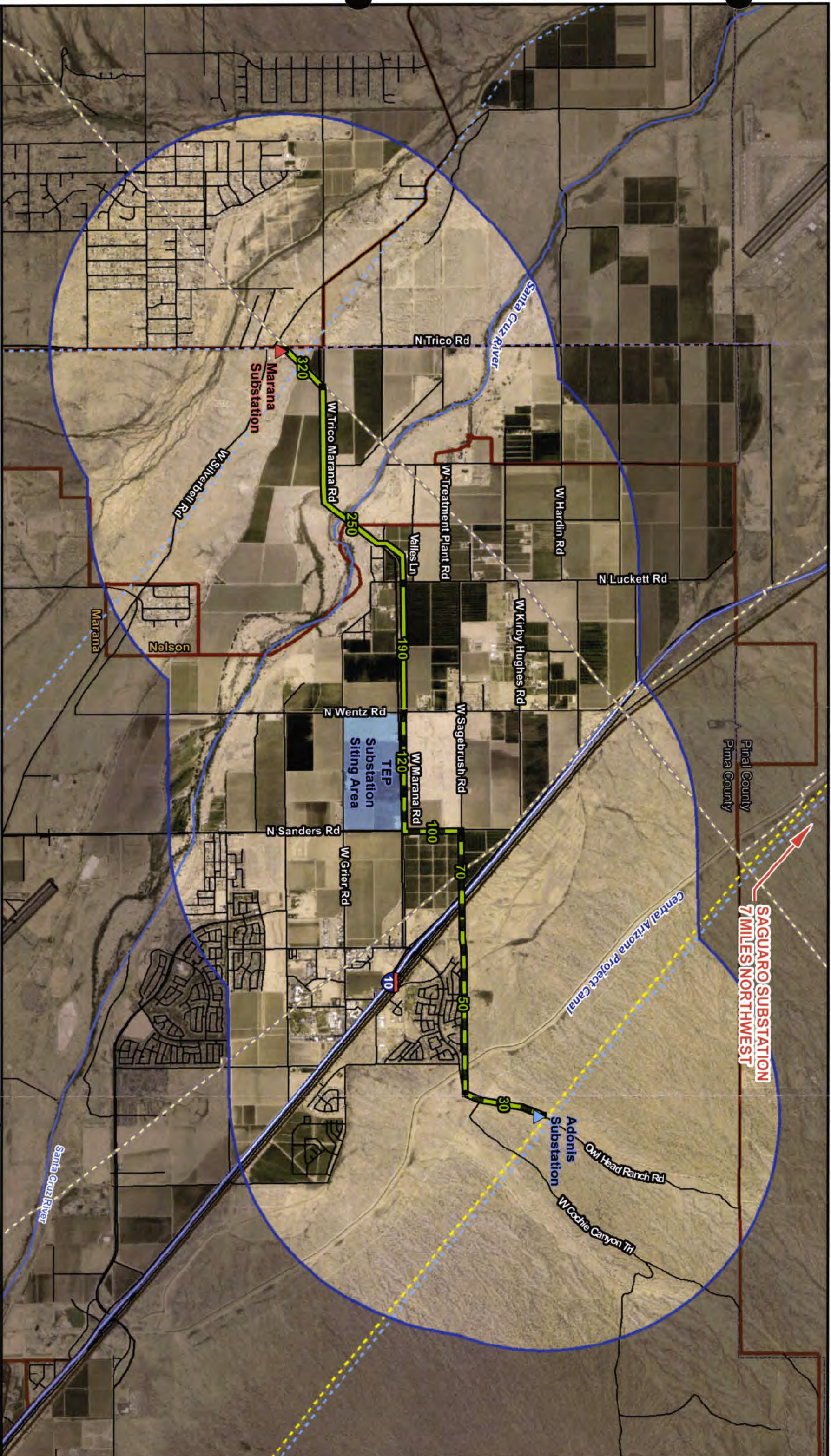
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Pursuant to Arizona Revised Statutes (A.R.S.) 40-360, *et seq.*, Arizona Electric Power Cooperative, Inc. (“AEPCO”) is seeking a Certificate of Environmental Compatibility (“CEC”) granting authority to construct the Saguaro to Marana 115/138kV-kilovolt (kV) Transmission Line Project (Project). The proposed Project is a joint venture being undertaken by AEPCO and Tucson Electric Power Company (“TEP”). The U.S. Department of Agriculture Rural Utilities Service (“RUS”) is providing funding to AEPCO for construction of the 115kV transmission line portion of the Project, whereas construction of the 138kV transmission line will be funded by TEP.

### PROPOSED PROJECT DESCRIPTION

The Project consists of the construction and operation of a new transmission line between the planned Trico Electric Cooperative Inc. (“Trico”) Adonis Substation and the existing AEPCO Marana Substation near Marana, Arizona. The Project in its entirety will be constructed by AEPCO. The Project (Figure 1 – Proposed Route) consists of two separate transmission line configurations. One portion of the Project is a double-circuit 115/138kV transmission line to be jointly owned by AEPCO and TEP (the 115kV circuit will be owned and operated by AEPCO, and the 138kV circuit will be owned and operated by TEP); the other portion of the Project is a single-circuit transmission line owned and operated by AEPCO alone. The transmission line originates at Trico’s planned Adonis Substation. The location of the planned Adonis Substation enables AEPCO to connect to an existing transmission line, then interconnect to Arizona Public Service Company’s (“APS”) existing Saguaro Substation located approximately seven miles northwest of the planned Adonis Substation. In the future, TEP will connect its 138kV circuit to TEP’s existing 138kV Quad Circuit adjacent to the planned Adonis Substation. The previously mentioned transmission line segments are not part of this application and will not require a CEC under Arizona State Statutes. The proposed double-circuit 115/138kV transmission line would proceed west approximately four miles crossing Interstate 10, continuing to the intersection of West Marana Road and North Sanders Road. Between North Sanders Road and North Wentz Road, the 138kV line will be terminated for future use by TEP once a new substation location has been definitively located. From the new substation location, the line will proceed another three to four miles west as a single circuit 115kV transmission line to the existing AEPCO Marana Substation.

The Project is anticipated to be constructed primarily with self-weathering steel monopole structures approximately 65 to 120 feet in height with span lengths between 500 and 700 feet, within right-of-ways up to 120 feet wide. The exact size and type of structures that will be used will depend on the final engineering design.



Study Area

Interstate

Major Roads

Local Road

Railroad

County Boundary

Municipal Boundary

Existing Substation

Proposed Substation

Existing Pipeline

Existing 138kV Transmission Line

Existing 115kV Transmission Line

Existing 24.9kV Distribution Line

Proposed Route Single Circuit 115kV

Proposed Route Double Circuit 115/138kV

Route Link Node

Route Link Number

Scale in Feet

1 inch = 4,000 feet (1:48,000)

When Plotted at 11x17

Arizona G&T Cooperatives

BURNS & MCDONNELL

Figure 1

Proposed Route

Saguaro-Marana 115/138kV

Transmission Line Project

Arizona G&T Cooperatives

Source: ESRI, Burns & McDonnell

Issued: 4/27/2022

## **PROJECT PURPOSE AND NEED**

The Project purpose and need is to increase electric reliability and serve customers' growing energy needs in the surrounding AEPCO Project area by connecting the planned Trico Adonis Substation, existing AEPCO Marana Substation, and APS's Saguaro Substation. The Project will also add transmission capacity on the AEPCO transmission system to support the development of future energy generation projects.

TEP has identified the need to convert its existing 46kV sub-transmission system serving The Town of Marana by building and constructing a new 138kV substation and interconnecting the planned substation to the 138kV transmission system. This Project will connect the planned substation into the existing TEP 138kV transmission system.

Although both TEP and AEPCO have the necessary infrastructure to meet current energy needs in this area, electrical demand and future growth require new 115/138kV transmission lines and substations. The co-location of TEP and AEPCO assets will minimize environmental impacts and provide efficiencies in the permitting processes required to build the facilities.

## **ENVIRONMENTAL STUDIES**

AEPCO and its consultant, Burns & McDonnell, Inc. (BMcD), developed a public planning and outreach process to identify environmentally compatible routes for the Project. This planning process included examining an approximate 78.8-square-mile area to identify possible routes. More specifically, the process of identifying and evaluating transmission line routes was conducted in sequential phases, which included the following:

1. Defining the study area
2. Conducting comprehensive inventories of land uses and visual resources
3. Researching existing data on cultural and biological resources in the study area
4. Determining environmental and engineering opportunities and constraints
5. Developing preliminary transmission line link segments
6. Evaluating the transmission line link segments for potential environmental impacts
7. Compiling transmission line routes to avoid or minimize environmental impacts
8. Ranking transmission line routes based on environmental data, public input, and electrical system requirements
9. Examining right-of-way considerations, costs, and permitting requirements
10. Gathering input from agencies and stakeholders throughout the siting process

This process included identifying opportunities to co-locate the transmission lines along existing transmission lines, distribution lines, railroads, canals, or roadways and within undeveloped or agricultural areas to avoid environmentally sensitive areas, such as protected cultural resources, and to minimize impacts on nearby residences and landowners. The siting process resulted in the identification of more than 30 miles of preliminary route segments, referred to as links (Figure 2 – Preliminary Route Segments). A more detailed review of these links identified limitations in some areas. In the northeastern portion of the Project area, identification of archeological artifacts and remains in undeveloped State-owned land eliminated some links from further consideration.

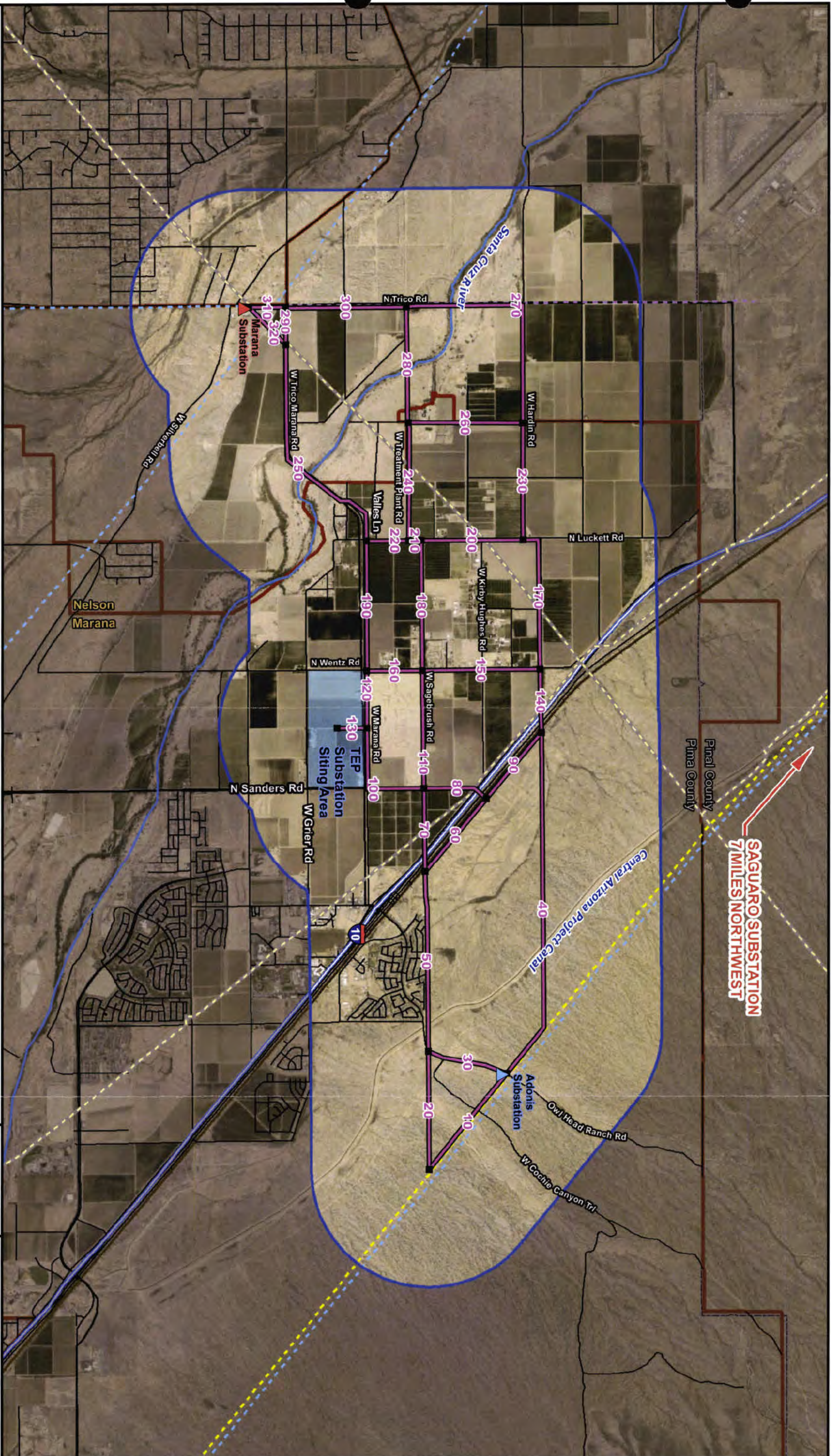
BMcD then completed detailed environmental data collection and analysis for lands within the Project area and determined the overall level of potential impact that the Project's route alternatives would have on the various environmental resources. This research included field visits to confirm existing site conditions and reviews of future planning documents and data, including communications with government agencies and landowners.

## **PUBLIC ENGAGEMENT**

AEPCO and BMcD initiated multiple public participation activities, including a project website (<https://azgtsaguaromarana.com/>), jurisdictional meetings, agency briefings, landowner contacts, newsletters, emails, a telephone information line, and social media posts. Through these activities, AEPCO requested and received public and agency feedback on the transmission line route alternatives. Using this information, AEPCO and BMcD examined the overall compatibility of the routes, incorporated feedback from agencies and the public, and identified a Proposed Route (refer to Figure 1) to be presented to the Arizona Power Plant and Transmission Line Siting Committee ("Siting Committee") and the Arizona Corporation Commission ("Commission") to consider in this application.

## **CONCLUSIONS**

The planning process conducted for this Project initially allowed for consideration of a broad range of reasonable alternative transmission line locations, and then focused on specific details and construction feasibility to assist AEPCO in identifying final transmission line routes. The decision to carry forward the Proposed Route (refer to Figure 1) in this CEC application was based on approximately 20 months of detailed environmental and engineering analysis and communications with stakeholders throughout the Project area.



**SAGUARO SUBSTATION**  
7 MILES NORTHWEST

**Reference Features**

- Study Area
- Interstate
- Major Roads
- Local Road
- Railroad
- County Boundary
- Municipal Boundary

**Utilities**

- ▲ Existing Substation
- ▲ Proposed Substation
- Existing Pipeline

**Existing Transmission Lines**

- - - Existing 138kV Transmission Line
- - - Existing 115kV Transmission Line
- - - Existing 24.9kV Distribution Line

**Preliminary Route Segments**

- Route Link
- Route Link Node
- 100 Route Link Number



**Figure 2**  
**Preliminary Route Segments**  
Saguaro - Marana 115/138kV  
Transmission Line Project  
Arizona G&T Cooperatives

This application includes the environmental evaluation and documentation relevant to the Project required by Arizona Administrative Code R14-3-219. The Project complies with land use plans and results in minimal adverse impacts on wildlife and vegetation, scenic areas, historic sites and structures, archaeological sites, and other factors to be considered by the Siting Committee. Moreover, the Project is supported by agencies, landowners, and residents within the communities. The Proposed Route presented in this CEC application is also considered environmentally compatible. In short, the CEC requested in this application balances, in the broad public interest, the need for an adequate, economical, and reliable supply of electric power with the desire to minimize impacts on the environment and ecology. As such, AEPCO respectfully requests that the Siting Committee grant the requested CEC for the Project and that the Commission approve the CEC.

## APPLICATION FOR CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY

1) "Name and address of the applicant, or in the case of a joint project, the applicants."

Arizona Electric Power Cooperative, Inc.  
1000 S Highway 80  
Benson, Arizona 85602

2) "Name, address and telephone number of a representative of an applicant who has access to technical knowledge and background information concerning the application in question and who will be available to answer questions or furnish additional information."

Mr. Kevin Barnes  
Environmental Permitting and Land Services Manager  
Arizona Electric Power Cooperative, Inc.  
1000 South Highway 80  
Benson, Arizona 85602  
520-586-5457

3) "State each date on which applicant has filed a ten-year plan in compliance with A.R.S. § 40-360.02 and designate each such filing in which the facilities for which this application is made were described. If they have not been previously described in a ten-year plan, state the reasons therefore."

In compliance with A.R.S. § 40-360.02, AEPCO and TEP have filed Ten-Year Plans each year from the inception of the statutory requirement through 2022. The facilities for which this application is made were described in multiple Plan filings by both AEPCO and TEP, as identified in the following table.

Filing Year	Docket Number	Project Name	Point of Origin	Interim Point	Point of Termination
AEPCO					
2015, 2016	E-00000D-15-0001	Marana to Thornydale to Saguaro 115 kV Interconnection	Marana Substation	Thornydale Substation	Saguaro Substation
2017, 2018	E-00000D-17-0001	Marana to Thornydale to Saguaro 115 kV Interconnect	Marana Substation	Thornydale Substation	Saguaro Substation
2019, 2020	E-00000D-19-0007	Thornydale to Saguaro 115 kV Interconnection	Marana Substation	Adonis Substation	Saguaro Substation

2021, 2022	E-99999A- 21-0009	Saguaro-Marana	Saguaro Substation	Adonis Substation	Marana Substation
TEP					
2007, 2008	E-00000D- 05-0040	Tortolita Substation – Marana Substation – North Loop Substation 138 kV	Tortolita 138 kV Substation	Marana 138 kV Substation	North Loop 138 kV Substation
2009, 2010	E-00000D- 09-0020	Tortolita Substation – Marana Substation – North Loop Substation 138 kV	Tortolita 138 kV Substation	Marana 138 kV Substation	North Loop 138 kV Substation
2011, 2012	E-00000D- 11-0017	Tortolita Substation – Marana Substation – North Loop Substation 138 kV	Tortolita 138 kV Substation	Marana 138 kV Substation	North Loop 138 kV Substation
2013, 2014	E-00000D- 13-0002	Tortolita Substation – Marana Substation – North Loop Substation 138 kV	Tortolita 138 kV Substation	Marana 138 kV Substation	North Loop 138 kV Substation
2015, 2016	E-00000D- 15-0001	Tortolita Substation – Marana Substation – North Loop Substation 138 kV	Tortolita 138 kV Substation	Marana 138 kV Substation	North Loop 138 kV Substation
2017, 2018	E-00000D- 17-0001	Tortolita Substation – Marana Substation – North Loop Substation 138 kV	Tortolita 138 kV Substation	Marana 138 kV Substation	North Loop 138 kV Substation
2019, 2020	E-00000D- 19-0007	Tortolita Substation – Marana Substation – North Loop Substation 138 kV	Tortolita 138 kV Substation	Marana 138 kV Substation	North Loop 138 kV Substation
2021, 2022	E-99999A- 21-0009	Tortolita Substation – Marana Substation – North Loop Substation 138 kV	Tortolita 138 kV Substation	Marana 138 kV Substation	North Loop 138 kV Substation

**4) "Description of the proposed facility, including:"**

**a) "With respect to an electric generating plant:"**

There are no electrical generating plants included in the Project.

**b) "With respect to proposed transmission line:"**

**i) "Nominal voltage for which the line is designed; description of the proposed structures and switchyards or substations associated therewith; and purpose for constructing said transmission line."**

**(1) Nominal Voltage:**

The normal voltages of the proposed Project's transmission lines are 115kV and 138kV.

**(2) Description of proposed structures:**

The proposed double-circuit 115kV/138kV and single-circuit 115kV transmission lines are anticipated to be constructed using steel monopole structures. The structures would be 65 to 85 feet in height on average, and up to 120 feet in height to accommodate spanning key features such as the Interstate 10 corridor. The average span length between structures would range between approximately 300 to 600 feet apart but could be shorter or longer depending on final engineering design to accommodate site conditions. The structures will have self-weathering steel, and conductors will have a non-specular finish to reduce visibility. Variations may be required to achieve site-specific mitigation objectives or meet site-specific engineering requirements.

Conceptual drawings showing the typical structures that may be used are provided in Exhibit G.

**(3) Description of proposed substations:**

The planned Trico Adonis Substation and the future TEP substation will contain typical substation equipment, including dead-end structures, bus work, switches, transformers, breakers, communication equipment, and a control structure.

**(4) Purpose of constructing said transmission line:**

The purpose of the Project is to deliver electrical power between the planned Trico Adonis Substation and the existing AEPCO Marana Substation with the construction of a new 115kV transmission line. The Project will interconnect AEPCO with the existing APS Saguaro Substation located approximately seven miles northwest of the planned Trico Adonis Substation. TEP has identified the need for a new 138kV substation within the town of Marana. TEP will need a 138kV circuit to connect with the existing TEP 138kV Quad Circuit.

The Project will increase electric reliably and serve members' and customers' growing energy needs, as well as add transmission capacity to support the development of future

energy generation projects.

- ii) **“Description of geographical points between which the transmission line will run the straight-line distance between such points and the length of the transmission line for each alternative route for which application is made.”**

**(1) Description of geographical points between which the transmission line will run**

A portion of the Project is an AEPCO/TEP double-circuit 115/138kV transmission line, and a portion of the Project is an AEPCO single-circuit transmission line.

Proposed Route

The transmission line originates at the planned Trico Adonis Substation. The location of the planned Adonis Substation enables AEPCO to connect to an existing transmission line, then interconnect to the existing APS Saguaro Substation located approximately seven miles northwest of the planned Adonis Substation. In the future, TEP will connect its 138kV circuit to the existing TEP 138 kV Quad Circuit adjacent to the planned Adonis Substation. The proposed double-circuit 115/138kV transmission line would proceed west approximately four miles crossing Interstate 10, continuing to the intersection of West Marana Road and North Sanders Road. Between North Sanders Road and North Wentz Road, the 138kV line will be terminated for future use by TEP once a new substation location has been definitively located. From the new substation location, the line will proceed another three to four miles west as a single circuit 115kV transmission line to the existing AEPCO Marana Substation.

**(2) Straight-line distance between such points:**

The straight-line distance for the Proposed Route transmission line is approximately 6.85 miles.

**(3) Length of transmission line for the alternative route:**

The approximate length for the Proposed Route is listed in the following table.

*Table 1: Length of Transmission Line Route*

Transmission Line Routes	Total Length (miles)
AEPCO	7.98
TEP	3.78

- iii) **“Nominal width of Right-of-Way required, nominal length of spans, maximum height of supporting structures and minimum height of conductor above ground.”**

**(1) Nominal width of Right-of-Way required:**

The right-of-way would be up to approximately 100 to 120 feet wide within the

requested corridor and may be co-located along existing roads or other utility rights-of-way. The location of the alignment for the right-of-way within this corridor will be determined according to site-specific design and environmental factors.

**(2) Nominal length of spans:**

The typical span length between structures will be approximately 300 to 600 feet, with variations made to achieve site-specific mitigation objectives or meet site specific engineering requirements. The average span length within private easements would be approximately 500-600 feet. The average span length within public rights-of-way would be approximately 300-400 feet.

**(3) Maximum height of structures above ground:**

The height of the supporting structures will not exceed 120 feet above ground.

**(4) Minimum height of conductor above ground:**

The minimum height of the conductor above existing grade will be 65 feet above ground.

- iv) **To the extent available, the estimated costs of the proposed transmission line and route, stated separately. (If application contains alternative routes, furnish an estimate for each route and a brief description of the reasons for any variations in such estimates.)"**

The estimated costs for the Proposed Route are listed in the following table.

*Table 2: Cost of Transmission Line Alternatives*

<b>Transmission Line Route</b>	<b>Total Length (miles)</b>	<b>Right-of-Way Costs (USD)</b>	<b>Construction Costs</b>	<b>Total Costs</b>
AEPCO	7.98	\$870,480	\$5,940,000	\$6,810,480
TEP	3.78	\$200,707	\$1,980,000	\$2,180,707
<b>Total</b>	--	<b>\$1,071,187</b>	<b>\$7,920,000</b>	<b>\$8,991,187</b>

- v) **"Description of proposed route and switchyard locations. (If application contains alternative routes, list routes in order of applicant's preference with a summary of reasons for such order of preference and any changes such alternative routes would require in the plans reflected in (i) through (iv) hereof)."**

**Description of proposed route:**

See response to (4)(b)(ii), above.

**Description of alternative route and switchyard locations:**

- vi) "For each alternative route for which application is made, list the ownership percentages of land traversed by the entire route (federal, state, Indian, private, etc.)."

The approximate land ownership percentages for the Proposed Route are listed in the following table.

*Table 3: Transmission Line Route Land Ownership*

<b>Transmission Line Routes</b>	<b>Total Length (Miles)</b>	<b>Private (Percent)</b>	<b>Municipal (Percent)</b>	<b>State (Percent)</b>	<b>Federal (Percent)</b>
AEPCO	7.98	67.9	4.0	23.0	5.1
TEP	3.78	40.3	0	48.8	10.9

- 5) "List the areas of jurisdiction [as defined in A.R.S. § 40-360(1)] affected by each alternative site or route and designate those proposed sites or routes, if any, which are contrary to the zoning ordinances or master plans of any of such areas of jurisdiction."

The Proposed Route is located within the jurisdiction of the Town of Marana and Pima County, Arizona, within federal, State, and privately owned land. No routes are contrary to the zoning ordinances or master plans of their jurisdictions.

- 6) "Describe any environmental studies applicant has performed or caused to be performed in connection with this application or intends to perform or cause to be performed in such connection, including the contemplated date of completion."

The Applicant has evaluated available secondary and field data related to biological resources, visual resources, cultural resources, recreational resources, land use, noise levels, and communications signals to assess the potential impacts that may result from the construction, operation, and maintenance of the Project. These evaluations are included in Exhibits B, C, D, E, F, H, and I to this application.

The Applicant has also conducted an extensive public and agency outreach process to gather information and comments relative to the Project. Information collected and analyzed in conjunction with the outreach process is included in Exhibit J of this application.

ARIZONA ELECTRIC POWER COOPERATIVE, INC.

By:



04/28/22

**Kevin Barnes, RWA, Environmental Permitting and Land Services Manager**

## EXHIBIT A – LOCATION MAP AND LAND USE INFORMATION

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As stated in the Arizona Administrative Code R14-3-219, Exhibit 1:

*Exhibit A:*

*1. Where commercially available, \*\* a topographic map, 1:250,000 scale, showing the proposed plant site and the adjacent area within 20 miles thereof. If application is made for alternative plant sites, all sites may be shown on the same map, if practicable, designated by applicant's order of preference.*

*2. Where commercially available, \*\* a topographic map, 1:62,500 scale, or each proposed plant site, showing the area within two miles thereof. The general land use plan within this area shall be shown on the map, which shall also show the areas of jurisdiction affected and any boundaries between such areas of jurisdiction. If the general land use plan is uniform throughout the area depicted, it may be described in the legend in lieu of an overlay.*

*3. Where commercially available, \*\* a topographic map, 1:250,000 scale, showing any proposed transmission line route of more than 50 miles in length and the adjacent area. For routes less than 50 miles in length, use a scale of 1:62,500. If application is made for alternative transmission line routes, all routes may be shown on the same map, if practicable, designated by applicant's order of preference.*

*4. Where commercially available, \*\* a topographic map, 1:62,500 scale, of each proposed transmission line route of more than 50 miles in length showing that portion of the route within two miles of any subdivided area. The general land use plan within the area shall be shown on a 1:62,500 map required for Exhibit A-3, and for the map required by this Exhibit A-4, which shall also show the areas of jurisdiction affected and any boundaries between such areas of jurisdiction. If the general land use plan is uniform throughout the area depicted, it may be described in the legend in lieu of an overlay.*

*\*\*If a topographic map is not commercially available, a map of similar scale, which reflects prominent or important physical features of the area in the vicinity of the proposed site or route shall be substituted.*

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### OVERVIEW

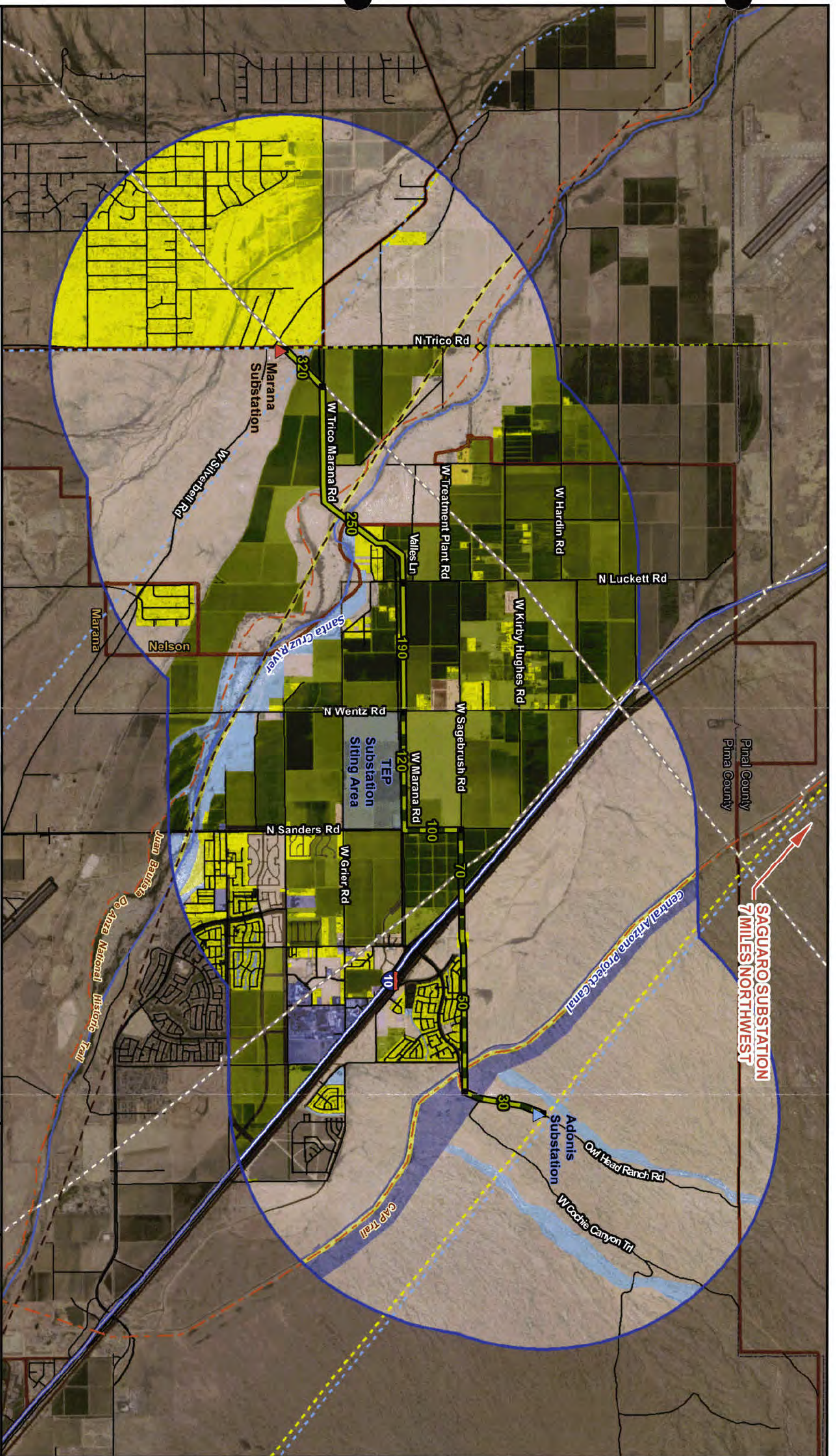
This section summarizes existing and future land uses in the Project area based on a comprehensive inventory of the existing and planned uses, jurisdictional boundaries, and land ownership patterns.

The following exhibits are required by the Arizona Administrative Code R14-3-219 to support the land use studies conducted for this application:

- Exhibit A-1 illustrates land ownership within the Project area
- Exhibit A-2 illustrates jurisdiction encompassing the Project area
- Exhibit A-3 illustrates existing land use within the Project area
- Exhibit A-4 illustrates planned land use within the Project area







SAGUARO SUBSTATION  
7 MILES NORTHWEST

**Reference Features**

- Study Area
- Interstate
- Major Roads
- Local Road
- Trail
- Trailhead
- Railroad
- County Boundary
- Municipal Boundary

**Utilities**

- Existing Substation
- Proposed Substation
- Existing Pipeline

**Existing Transmission Lines**

- Existing 138kV Transmission Line
- Existing 115kV Transmission Line
- Existing 24.9kV Distribution Line

**Existing Land Use**

- Agriculture
- Commercial
- Industrial
- Open Space/Park
- Public/Institutional
- Residential
- River/Wash
- Transportation
- Utility
- Vacant/Undeveloped

**Proposed Route**

- Proposed Route Single Circuit 115kV
- Proposed Route Double Circuit 115/138kV
- Route Link Node
- Route Link Number

Scale in Feet  
1 inch = 4,000 feet (1:48,000)  
When Plotted at 11x17

Arizona G&T Cooperatives  
BURNS & MCDONNELL

**Exhibit A-3**  
**Existing Land Use**  
Saguaro - Marana 115/138kV Transmission Line Project  
Arizona G&T Cooperatives



The Saguaro to Marana 115/138kV Transmission Line Project is located predominately on private land (67.9%), as well as federal (5.1%), state (23.0%), and municipal (4.0%) land management agencies as illustrated on Exhibit A-1 – Land Ownership. The Project is within the jurisdiction of the Town of Marana and Pima County, and the State of Arizona as illustrated on Exhibit A-2 – Jurisdiction. Other key agencies with jurisdiction in the area are Central Arizona Project (“CAP”), Bureau of Reclamation, and Arizona Department of Transportation (“ADOT”).

The Project area is approximately 43 square miles and is located approximately between West Hardin Road on the north, West Marana/W Trico Marana Road on the south, North Trico Road on the west and West Cochise Canyon Trail on the east. Three major linear features bisect the study area trending from northwest to southeast including the Santa Cruz River in the western portion of the Project area, Interstate 10/Union Pacific Railroad in the central portion of the Project area, and the CAP Canal in the eastern portion of the study area. These major features help influence land use development patterns in the Project area.

The primary existing land uses in the study area include residential, commercial, industrial, public/institutional, airports, agricultural, canals, rivers, transportation, parks/recreation/open space and vacant/undeveloped.

## INVENTORY METHODS

The Project team consulted with the planning jurisdictions of Town of Marana, Pima County, and Arizona State Land Department (“ASLD”) on existing and future land uses. Each of these entities were contacted to collect and discuss existing and future land use data. The Make Marana 2040 General Plan and the Pima Prospers – Pima County Comprehensive Plan 2015 was referenced to accurately identify any future land use plans within the study area.

Electronic data including general/comprehensive planning documents, and aerial imagery (e.g., Google Maps, Bing Maps, National Agricultural Imagery Program 2020-2021) was gathered from various online and agency sources to compose a comprehensive geographical information system (“GIS”) database of existing and planned land uses.

The existing and planned land use data were mapped in the GIS database and field reviews were conducted between summer 2020 and fall of 2021 to verify the information was accurate. Field reviews were conducted in September 2020, June 2021, and November 2021.

AEPCO also conducted briefings with jurisdictional representatives during the siting process to keep them informed regarding the project’s status and to allow them to comment on the existing and future land use data, as well as the preliminary route alternatives and Proposed Route. After the briefings, the agencies provided additional information in the form of conceptual plans, maps, and written descriptions of several new developments that had recently been proposed, approved or in the process of being approved. The GIS database and maps were updated periodically to reflect new information received from the jurisdictions.

## INVENTORY RESULTS

### Existing Land Uses

The major categories inventoried as existing land uses included residential, commercial, industrial, public/institutional, airports, agricultural, canals, rivers, transportation, parks/recreation/open space and vacant/undeveloped. The existing land uses inventoried in the Project area are illustrated on Exhibit A-3 – Existing Land Use. These categories are described in further detail as follows:

- Residential land uses include single-family, multi-family, and mobile homes in densities ranging from low (less than 2 units per acre) to high (more than 15 units per acre).
- Commercial land uses include retail establishments, office buildings, automotive repair, stockyards/feed stores, landscape nurseries, and warehouses.
- Industrial land uses may include manufacturing facilities and fabrication.
- Public/institutional land uses include churches, government facilities, schools/educational facilities.
- Airports can include rural airstrips, Marana Regional Airport, Pinal Airpark and associated airspace.
- Agricultural land uses include farmland, sheds/barns, arenas, processing facilities, and irrigation facilities.
- Parks/recreation/open space lands are designated by the managing jurisdiction or agency for open space. Typically, they include municipal/recreational parks, riverbeds/washes, trails/trailheads, and non-developable open space (e.g., areas with slopes in excess of 15 percent).
- Transportation corridors including highways, major arterial roads, local access roads, and unimproved agricultural service roads.
- Vacant/undeveloped lands are areas with no existing development. Typically, there are no structures or buildings present on the properties, and the tracts of land are in a non-developed state. These areas may be disturbed or undisturbed.

Residential uses are dispersed throughout the Project area including isolated or small clusters of rural residences along West Marana Road, North Wentz Road and North Luckett Road. There is one master planned residential development, San Lucas Community, located east of Interstate 10 along West Cochise Trail.

Commercial development occurs at the southwest corner of the intersection of Interstate 10 and West Marana Road consisting of restaurants and retail facilities. There are some dispersed commercial developments occurring in the agricultural areas including a landscape nursery, auto repair shops, and stockyard/feed store.

Industrial facilities are minimal and primarily occur along Interstate 10 frontage roads southwest of the Interstate 10/West Marana Road interchange.

The major transportation route in the Project area is Interstate 10, bisecting the central portion of the Project area, trending northwest to southeast.

There are several other major arterial roadways crossing through the Project area that form the general grid patterns where land uses occur. These roads provide access to agricultural, residential, recreation, and commercial land uses on both sides of Interstate 10. Roadways west of Interstate 10 include North Sanders Road, North Wentz Road, North Luckett Road, West Grier Road, West Sagebrush Road, West Kirby Hughes Road, and West Hardin Road. Roadways east of Interstate 10 include North Cochise Canyon Trail and North Adonis Road.

The area east of the CAP Canal is largely a natural undeveloped desert upland area leading to the flat lands/drainages at the base of the west side of the Tortolita Mountains. The Santa Cruz River is a predominantly natural riparian corridor and cuts through the western portion of the Project area trending northwest to southeast.

There are several 115kV and 138kV transmission lines present throughout the Project area, as well as 24.5kV and lower voltage distribution lines. There are parallel 115kV and 138kV transmission lines in a corridor crossing through the Project area east of the CAP Canal where the proposed Adonis Substation will be located. There are three 115kV lines and a 24.5kV distribution line within west side of the Project area near North Trico Road connecting into the Marana Substation. Numerous distribution lines that serve rural residents and agricultural irrigation are located along most of the major arterial roads and crossing through undeveloped desert lands.

There is a railroad owned by Union Pacific Railroad ("UPRR") that crosses through the central portion of the Project area paralleling the east side of Interstate 10. Also paralleling the railroad is a petroleum pipeline corridor owned by Kinder Morgan and fiber optic lines owned by AT&T and PF.Net. There is a natural gas pipeline corridor near the Marana Substation crossing through the Project area towards the northeast near the intersection of Interstate 10 and North Wentz Road.

The Project area consists of a wide range of existing land uses dispersed throughout the Project area as depicted in the photographs on the following pages.



*Rural Residences*



*San Lucas Residential Community*



*Agricultural/Farmstead Land*



*Industrial Development*



*West Marana Road*



*Santa Cruz River Bridge West Marana Road*



*CAP Canal*



*CAP Trail*



*Interstate 10/West Marana Road Interchange and Frontage Road*



*Interstate 10/West Sagebrush Road Intersection and Frontage Road*



*Interstate 10/Frontage Road*



*Union Pacific Railroad*



*115kV Wooden H-Frame and 138kV Quad Circuit Transmission Line Corridor*



*Marana Substation*

## **Planned Land Uses**

Two levels of planned developments were identified: general plan uses and approved developments. General plan land uses (e.g., residential, commercial/employment, industrial, parks/preservation, schools etc.) are land use categories defined in planning documents from respective jurisdictions. Approved developments are defined as developments that have been submitted to a jurisdiction and may be at various stages design and approval ranging from preliminary to final plat. The planned land uses inventoried in the Project area are illustrated on Exhibit A-4 – Planned Land Use.

The major categories inventoried for future land use included all existing and planned residential, commercial, industrial, public/quasi-public, schools/educational facilities, vacant/undeveloped, and recreation/parks (e.g., existing development was assumed to remain in the future). Based on general plans, the extent of agricultural lands is expected to decrease in the future and may be replaced in entirety; these areas are anticipated to convert to residential, business park, commercial, industrial, and open space. Much of the land that is currently used for agriculture is planned for residential or employment/commercial uses. Most of the central and western portion of the study area is classified as traditional neighborhoods and master planned neighborhood areas. These master plan areas are defined as areas guided by separate development approvals which establish the land use, densities, and intensities of specific areas, such as Sanders Groves, Villages of Tortolita, and Uptown at Marana (Town of Marana 2019).

Other future land uses taken into consideration during the project siting process include the review of recreational or undeveloped land use areas within the study area. The Pima County Planning and Regulation Department identifies existing and proposed recreational opportunities such as county parks, open space, and trails within Pima County (Pima County 2015). Parks and recreational areas such as the CAP Canal and CAP Trail, found in the eastern portion of the study area, and the Juan Bautista National Historic Trail, found in the western portion of the study area, were identified and examined to preserve the recreational use and scenic quality of the area to the extent possible.

## **IMPACT ASSESSMENT METHODOLOGY**

### **Impact Criteria**

Resource compatibility was the initial element in determining the level of impact that would occur on each land use. The presence or absence of existing transmission lines also was a factor in determining impacts, as the introduction of new structures would constitute a greater impact than rebuilding or upgrading an existing line. In addition, site-specific factors were considered including the nature of the potential losses or restrictions on land use. For each area of affected land use, only the impacts within the assumed right-of-way of each route alternative were assessed.

The impact assessment was conducted to determine the effect of the Preferred Routes on existing and future land uses. The impact assessment for each transmission line route was based on the criteria described below in Table A-1.

**Table A-1 – Land Use Impact Assessment Criteria**

<b>Impact Rating</b>	<b>Criteria</b>
Low	<ul style="list-style-type: none"><li>• Minimal potential conflicts with existing and planned land uses</li><li>• Routes would have minimal conflict with agency planning guidelines</li><li>• Examples may include residential areas with existing power and distribution lines; commercial or industrial areas; areas with good construction and maintenance access (e.g., roads); previously disturbed areas; and future general planned residential, commercial, and industrial areas</li></ul>
Moderate	<ul style="list-style-type: none"><li>• Some conflicts with existing and planned land uses; however, the potential for mitigation efforts to be successful may reduce impacts</li><li>• Examples may include commercial areas; primary and secondary roads with no existing transmission lines; residential areas with existing transmission lines where homes are not displaced, or access restricted permanently and/or temporarily; agricultural and/or ranching uses; undisturbed areas that have minimal recreational value and are planned for development; and future approved residential developments</li></ul>
High	<ul style="list-style-type: none"><li>• Route conflicts with existing and planned land uses (e.g., land areas may be identified as protected by agency planning guidelines and mitigation may not effectively reduce impacts to a lower level)</li><li>• Examples may include existing residential areas without transmission and distribution lines where homes are displaced or access restricted permanently and/or temporarily, existing or planned school areas, existing or planned open space areas, airports, and areas with utilities recently placed underground</li></ul>

## **MITIGATION MEASURES**

The impact assessment considered several mitigation measures that AEPCO will include in the final project design to reduce potential impacts on existing and planned land uses. The list below identifies the mitigation measures that would be implemented to reduce land use impacts resulting from the proposed facilities.

1. All construction vehicle movement outside of the right-of-way will be restricted to predesignated access, contractor-acquired access, or public roads.
2. Access to all lands adjacent to the transmission line will be maintained during construction, unless otherwise agreed to by the landowners.
3. The limits of construction activities typically will be predetermined, with activity restricted to and confined within those limits.
4. Irrigation facilities (e.g., canals, tanks, water lines, wells) will be repaired or replaced to pre-disturbed conditions as required by the landowner agency if they are damaged or destroyed by construction activities.
5. All existing roads will be left in a condition equal to or better than their condition prior to the construction of the transmission line.

6. Fences and gates, if damaged or destroyed by construction activities, will be repaired or replaced to their original pre-disturbed condition as required by the landowner.
7. During operation of the transmission line, the right-of-way will be maintained free of construction-related debris.
8. Structures will comply with Federal Aviation Administration guidelines and military aircraft safety requirements to minimize aircraft hazards.

## IMPACT ASSESSMENT RESULTS

The following sections provide a general description of the potential impacts on existing and planned land uses for the proposed transmission line route. The potential impacts consider the existing, approved plans, and general plan conditions, as well as previously described mitigation measures incorporated into the project description. Parcels of land with approved development plans were considered to be more sensitive than those with general plans with no specific development plans. The rationale for this difference in impact levels is that general plan users would have the most opportunity to incorporate the proposed transmission lines into the future uses. Approved plans for specific land uses may have less opportunity to incorporate the proposed transmission lines, while existing land uses would have the least opportunity to plan or account for the proposed transmission lines.

Potential impacts from the Proposed Route and associated link segments on land use are summarized in Table A-2. As indicated below, most of the transmission line routes are projected to have low to moderate impacts.

**Table A-2 – Land Use Impact Assessment Results**

<b>Preferred Route Link Segment</b>	<b>Existing Land Use</b>	<b>Planned Land Use</b>
30	<ul style="list-style-type: none"> <li>Low impacts to undeveloped desert land where transmission line would follow existing road</li> <li>Moderate to high impacts on open space along CAP Trail</li> </ul>	<ul style="list-style-type: none"> <li>Low impacts to general planned recreation and residential development</li> </ul>
50	<ul style="list-style-type: none"> <li>Low impacts to undeveloped desert land</li> <li>High impact to a rural farmstead and corral</li> </ul>	<ul style="list-style-type: none"> <li>Moderate impacts to approved plans for commercial development in the Villages of Tortolita</li> </ul>
70	<ul style="list-style-type: none"> <li>Low impacts to agricultural land, where transmission line would follow existing road</li> <li>Low to moderate impacts crossing railroad tracks, natural gas pipeline, fiber optic line, and Interstate 10</li> </ul>	<ul style="list-style-type: none"> <li>Low to moderate impacts to approved commercial development in Uptown at Marana</li> </ul>
100	<ul style="list-style-type: none"> <li>Low impacts to agricultural land, where transmission line would</li> </ul>	<ul style="list-style-type: none"> <li>Low to moderate impacts to approved residential development in Sanders</li> </ul>

Preferred Route Link Segment	Existing Land Use	Planned Land Use
	follow existing road	Grove or Uptown at Marana
120	<ul style="list-style-type: none"> <li>Low impacts to agricultural land, where transmission line would follow existing road</li> </ul>	<ul style="list-style-type: none"> <li>Low to moderate impacts to approved residential development in Sanders Grove</li> </ul>
190	<ul style="list-style-type: none"> <li>Low impacts to agricultural land, where transmission line would follow existing road</li> </ul>	<ul style="list-style-type: none"> <li>Low impacts to general planned residential development</li> </ul>
250	<ul style="list-style-type: none"> <li>Low impacts to agricultural land, where transmission line would follow existing road</li> <li>Moderate to high impacts to rural residences</li> <li>Moderate to high impacts on open space along Santa Cruz River and Juan Bautista National Scenic Trail</li> </ul>	<ul style="list-style-type: none"> <li>Low impacts to general planned residential development</li> </ul>
320	<ul style="list-style-type: none"> <li>Low impacts to agricultural and undeveloped land, where transmission line would follow existing road</li> <li>Low to moderate impacts paralleling natural gas pipeline</li> </ul>	<ul style="list-style-type: none"> <li>Low impacts to general planned employment development</li> </ul>

Table A-3 includes a summary of impacts for land use by route and link segment for each of the Proposed Route and associated link segments.

**Table A-3 – Land Use Impact Assessment Route and Link Segment Summary**

Preferred Route Link Segment	Mileage	Existing Land Use			Planned Land Use		
		High	Moderate	Low	High	Moderate	Low
30	0.69	0.14	0.55	0.00	0.15	0.55	-
50	1.53	0.39	1.14	-	0.26	1.14	0.14
70	0.71	-	0.18	0.52	-	0.20	0.51
100	0.99	-	0.01	0.99	-	0.36	0.63
120	0.49	-	-	0.49	-	-	0.49
190	1.10	-	0.01	1.09	-	1.09	0.01
250	2.03	0.29	0.47	1.27	0.29	1.75	-
320	0.45	-	0.02	0.42	-	0.45	-
<b>Route Total</b>	<b>7.99</b>	<b>0.82</b>	<b>2.38</b>	<b>4.78</b>	<b>0.69</b>	<b>5.53</b>	<b>1.77</b>

Note: Tabulating mileage numbers may result in slight differences between totals due to rounding.

## CONCLUSIONS

Most of the impacts on existing and future land use resulting from construction, operation, and maintenance of the Proposed Route would be low to moderate. This is primarily due to the routes being located within existing agricultural or undeveloped lands, where the line would parallel existing roads. High impacts would occur where the route would cross trails and designated open space used for recreation along the CAP Canal and Santa Cruz River. Other moderate to high impacts would occur where the proposed route could cross through rural residential properties where there are corrals for livestock. Moderate impacts could also occur to approved developments including Villages at Tortolita, Sanders Grove, and Uptown at Marana, which includes future residential and commercial development.

Standard design features and mitigation measures incorporated into the project during planning, final design, right-of-way acquisition, and construction may further reduce impacts. AEPCO will work with landowners, residents, and affected jurisdictions to reduce or minimize potential effects from the Proposed Route.

## REFERENCES

Pima County. 2015. Pima Prospers Comprehensive Plan. Available at  
[https://webcms.pima.gov/UserFiles/Servers/Server\\_6/File/Government/Pima%20Prospers/Official%20Plan/Official%20with%20revisions/Final%20Policy%20Document\\_Rev%202.19.pdf](https://webcms.pima.gov/UserFiles/Servers/Server_6/File/Government/Pima%20Prospers/Official%20Plan/Official%20with%20revisions/Final%20Policy%20Document_Rev%202.19.pdf)

Town of Marana. 2019. Make Marana 2040 General Plan. Available at  
<https://static1.squarespace.com/static/54cc191ce4b0f886f4762582/t/5e3d9511fa2d9e26eee804cd/1599766108480/Make+Marana+General+Plan+2040.pdf>.

## EXHIBIT B – ENVIRONMENTAL STUDIES

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As stated in the Arizona Administrative Code R14-3-219, Exhibit 1:

*Exhibit B:*

*Attach any environmental studies which applicant has made or obtained in connection with the proposed site(s) or route(s). If an environmental report has been prepared for any federal agency or if a federal agency has prepared an environmental statement pursuant to Section 102 of the National Environmental Policy Act, a copy shall be included as a part of this exhibit.*

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The Siting Study Report Exhibit B-1 and Cultural Resources Class 1 Survey Report Exhibit B-2 are presented in the following pages.

*Exhibit B-1—Siting Study Report*

# Siting Study Report

## Arizona G&T Cooperatives

**Marana – Thornydale 115-kV Transmission Line Project  
Project No. 115355**

**Final  
11/4/2020**

# **Siting Study Report**

prepared for

**Arizona G&T Cooperatives  
Marana – Thornydale 115-kV Transmission Line Project  
Benson, Arizona**

**Project No. 115355**

**Final  
11/4/2020**

prepared by

**Burns & McDonnell  
Phoenix, Arizona**

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## LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Term/Phrase/Name</u>
ACC	Arizona Corporation Commission
AGL	Above ground level
AzGT	Arizona G&T Cooperatives
CEC	Certificate of Environmental Sensitivity
CFR	Code of Federal Regulations
CLS	Conservation Land System
FAA	Federal Aviation Administration
kV	Kilovolt
ROC	Required Obstacle Clearance
TERPS	Terminal Instrument Procedures

## 1.0 PROJECT OVERVIEW

Arizona G&T Cooperatives (AzGT) has conducted a study to determine the feasibility of siting and permitting a new 115-kilovolt (kV) transmission line between the existing Marana and Thornydale Substations (located on the west and east side of Interstate 10, respectively) near Marana, Arizona, and is referred to as the Marana – Thornydale 115-kV Transmission Line Project (Project). The purpose and need for the new transmission line route are to help deliver power to meet growing residential, commercial, and industrial load in the area, while providing increased reliability to serve customers well into the future.

The objective of the siting study is to determine if select transmission line route alternative links are feasible in meeting the Project purpose and need, while fulfilling the regulatory requirements to successfully permit the Project. This siting study will be the first phase of a multi-phase process should AzGT decide to move forward with obtaining a Certificate of Environmental Sensitivity (CEC) from the Arizona Corporation Commission (ACC).

Burns & McDonnell has conducted this siting study in coordination with AzGT. The methods and results of the study are described below, along with conclusions and recommendations for AzGT to consider when determining how to proceed with the Project.

## 2.0 PROJECT STUDY AREA

The Project is located within the jurisdiction of the Town of Marana and Pima County, Arizona. The Project study area is approximately 78.8 square miles and is located along Interstate 10, situated between the existing Marana Substation and Thornydale Substation. The Marana Substation is located within Pima County, approximately 0.25 miles south of the intersection of North Trico Road and West Marana Road. The Thornydale Substation is located within Pima County along the north side of West Tangerine Road, approximately 1.5 miles east of Interstate 10.

The study area consists of a wide range of existing and planned land uses dispersed throughout the study area as depicted in the photographs below. Development is relatively sparse within the desert and agricultural landscape, including residential communities and rural residences, commercial development, industrial facilities, community facilities/schools, the Marana Regional Airport, and highways/roads.



*Marana Substation*



*Thornydale Substation*



*Desert Lands East of Interstate 10*



*Agricultural Land West of Interstate 10*



*Interstate 10 and Railroad Corridor*



*Industrial Development*



*Santa Cruz River*



*Commercial Development*



*Marana Schools*



*Rural Residences*

### **3.0 SITING STUDY**

#### **3.1 Methods**

The process of identifying and evaluating potential transmission line routes was conducted in sequential steps with review of data and input from AzGT at key intervals during the process. Data sources were collected primarily from the Town of Marana and Pima County GIS databases, Google Earth, and other secondary sources of information. A field review was also conducted on September 15, 2020, to confirm data and validate the preliminary route alternatives that were developed during the siting studies. There are five steps to completing a typical siting study for the proposed transmission line. At this stage of the study, only the first two steps were completed, but steps three through five would be completed if the study moves into the next phase of more detailed analysis, public/agency involvement, and permitting.

##### **3.1.1 Step One (completed)**

A study area and required facilities were defined by Burns & McDonnell and AZGT based on the Project purpose and need. After definition of the study area, inventories of existing resources were conducted, primarily consisting of existing and planned land uses, but also giving consideration of visual resources, cultural resources (archaeological and historic), and biological resources (habitat/conservation areas).

##### **3.1.2 Step Two (completed)**

An opportunities and constraints analysis was conducted to identify the sensitivity of the environment to the construction of a transmission line. Opportunity areas were also identified where a transmission line would be considered most compatible due to existing linear features such as transmission and distribution power lines. Each existing and planned land use category was assigned a sensitivity level based on the sensitivity of those uses to the introduction of a transmission line within that use category. The highest sensitivity included undeveloped desert or agricultural land, while the least compatible would be residential areas or schools. Opportunity areas for preliminary alternative links primarily followed section lines, half-section lines, property boundaries, and existing power lines and roads. The results of the sensitivity mapping allowed preliminary alternative links (short segments of potential transmission line segments between other intersecting segments) to be defined. A field review of the preliminary alternative links to confirm relative feasibility was also conducted.

##### **3.1.3 Step Three (to be completed)**

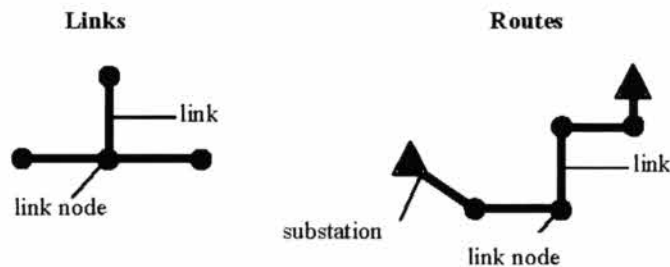
Step 3 would consist of narrowing down the range of preliminary alternative links, including recommending some alternative links to be carried forward for additional analysis and other links for elimination due to undesirable environmental and engineering factors or other technical considerations

(e.g., constructability and right-of-way). Agency and public input may be gathered at this point to provide additional information supporting continued evaluation of the alternative links or elimination of other alternative links.

### 3.1.4 Step Four (to be completed)

In Step Four, alternative links are combined to form complete transmission routes (connections between two substations). After transmission line routes are identified, detailed environmental analyses (e.g. impact assessment and mitigation planning) are conducted on each route segment to evaluate the potential impacts of each route with respect to environmental resources (land use, visual, cultural, and biological resources) present along each route. Agency and public input may be gathered at this point to provide additional information supporting continued evaluation of the routes or elimination of other routes.

The diagram below illustrates the way alternative links were combined into transmission line routes.



### 3.1.5 Step Five (to be completed)

The final step will be for AzGT to select the preferred route for permitting and construction. AzGT will consider several factors, including regulatory approvals, environment, engineering, cost, right-of-way acquisition, and public comment when making route decisions. Once a preferred route and any alternative routes are identified, they will be presented in the CEC application to be reviewed by the Arizona Power Plant and Transmission Line Siting Committee and approved by the ACC.

## 3.2 Data Collection

The Project team identified available environmental data primarily from the planning jurisdictions of the Town of Marana and Pima County, Arizona for information on existing and future land uses. Additional data was collected via other electronic data sources and mapping services including the following:

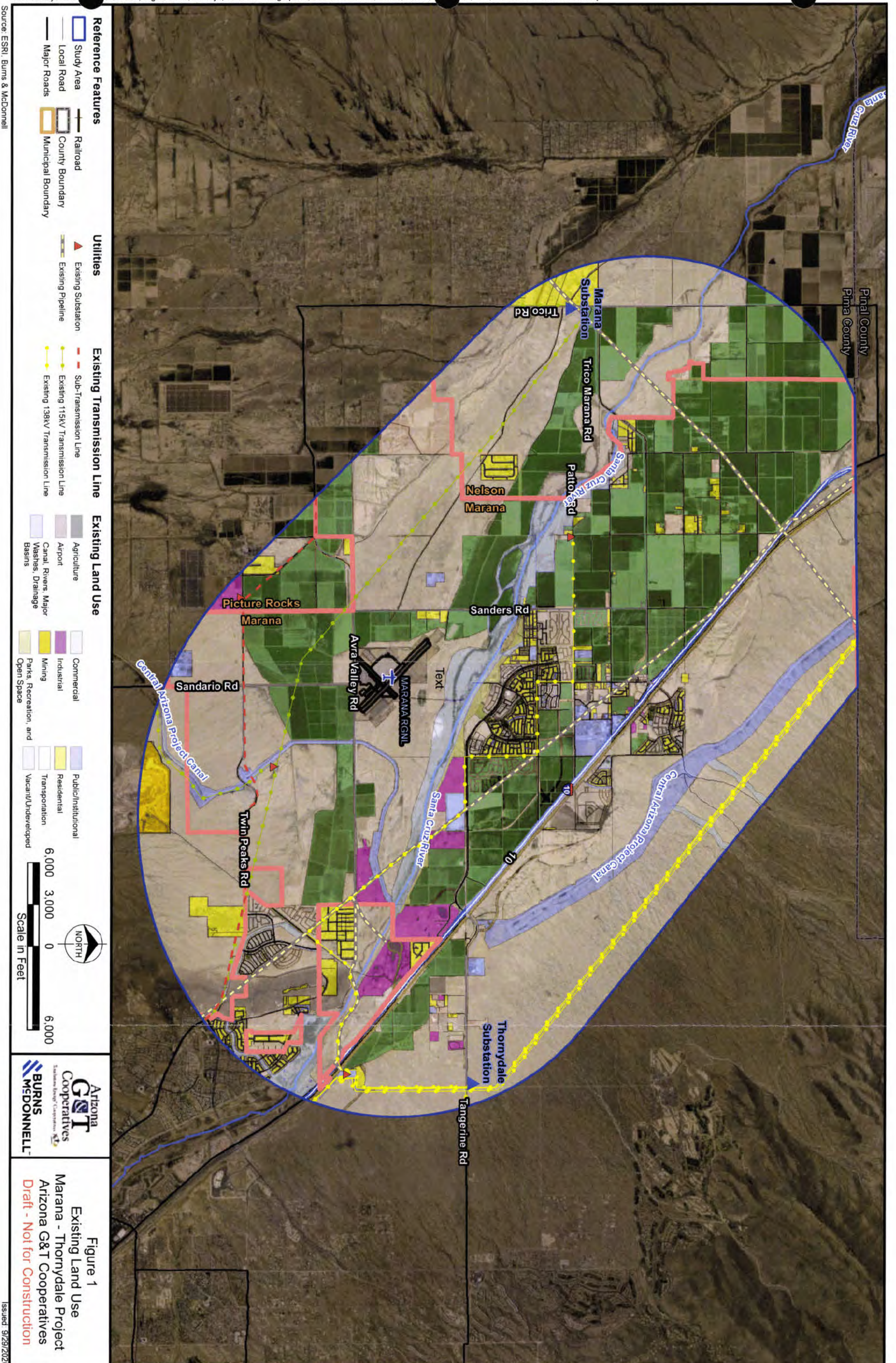
- Federal Aviation Administration (FAA)
- U.S. Forest Service

- U.S. Geological Survey
- U.S. Department of Agriculture - Natural Resource Conservation Service
- U.S. Fish and Wildlife Service
- U.S. Army Corps of Engineers
- Federal Emergency Management Agency
- U.S. Department of Agriculture - National Agricultural Statistics Service
- National Conservation Easement Database
- U.S. Census Bureau
- National Center for Education Statistics
- ESRI
- U.S. Department of Transportation - Bureau of Transportation Statistics
- U.S. Energy Information Administration
- Hitachi ABB Power Grid – Enterprise Software Velocity Suite
- Federal Communications Commission
- Google Earth

### **3.2.1 Land Use**

An inventory was conducted to determine where existing land uses may be affected with the construction, operation, and maintenance of the proposed 115-kV transmission line. Information was compiled from Pima County and Town of Marana maps and planning documents, as well as aerial photography. Existing land uses included residential, commercial, industrial, public-quasi-public, school or educational facilities, and mixed-use developments, as well as airports. Existing land uses are more concentrated in the Town of Marana and along Interstate 10. Existing land uses in rural areas are more dispersed and situated primarily within the agricultural areas along section lines/roads. Figure 1 (Existing Land Use) illustrates the location and type of land uses within the study area.

Planned land uses incorporated existing developed land uses (i.e., residential, commercial, industrial, public- quasi-public, school or educational facilities, and mixed use), along with known approved developments, jurisdictional general plans, and conceptual plans provided by developers where available. Future uses were assigned to those lands with existing agricultural or vacant/undeveloped uses, according to the plans.



All jurisdictional planning documents (e.g., general plans and available specific plans) used were the current resources for the municipalities for 2020. Aerial imagery (2018) was used for this analysis. A field review was conducted in September 2020 to review the existing conditions in the study area. Figure 2 (Planned Land Use) illustrates the location and type of planned land uses within the study area.

### **3.2.2 Federal Aviation Administration/Marana Regional Airport**

Utilizing publicly available data, the Terminal Instrument Procedures (TERPS) for the Marana Regional Airport were modeled. The Part 77 Imaginary Surfaces for this airport were also modeled and combined with the TERPS 3D surface, including the Required Obstacle Clearance (ROC), to develop a 3D surface representing the maximum elevation (above mean sea level) that the top of a structure could reach before being considered an obstruction to navigable airspace. This surface was then compared to the Digital Elevation Model for Pima County to develop a surface depicting the maximum height above ground level (AGL) that a structure could be built to without being considered an obstruction to navigable airspace. This analysis is based on the best publicly available data (as of the date of the study) and should not be considered a replacement for filing any proposed structure with the FAA as required by CFR Title 14 Part 77.9. Due to the close proximity to the Marana Regional Airport, all potential routes for this Project will require notice to the FAA (no matter the height of the structure). Figure 3 (FAA Marana Airport Height Restrictions) illustrates the height restrictions for vertical structures associated with the proposed 115-kV transmission line.

### **3.2.3 Biological Resources and Conservation Areas**

Biological resources data, including conservation and special management areas, has been compiled by Pima County within the Maeveen Marie Behan Conservation Lands System (CLS). The goal of the CLS is to balance development and biological diversity within the jurisdiction of Pima County, by encouraging growth outside designated conservation areas. These conservation lands potentially contain valuable habitat including wildlife, avian, and vegetation species within the study area. The policies within the CLS would not exclusively prohibit the development of the proposed 115-kV transmission line, but mitigation measures may need to be incorporated into the design and construction process to reduce potential effects to conservation lands. Figure 4 (Biological Resources and Conservation Areas) illustrates key areas that are emphasized in the Pima County CLS, including riparian habitat along the Santa Cruz River, desert lands, ridgelines associated with mountains/foothills, and select agricultural lands.

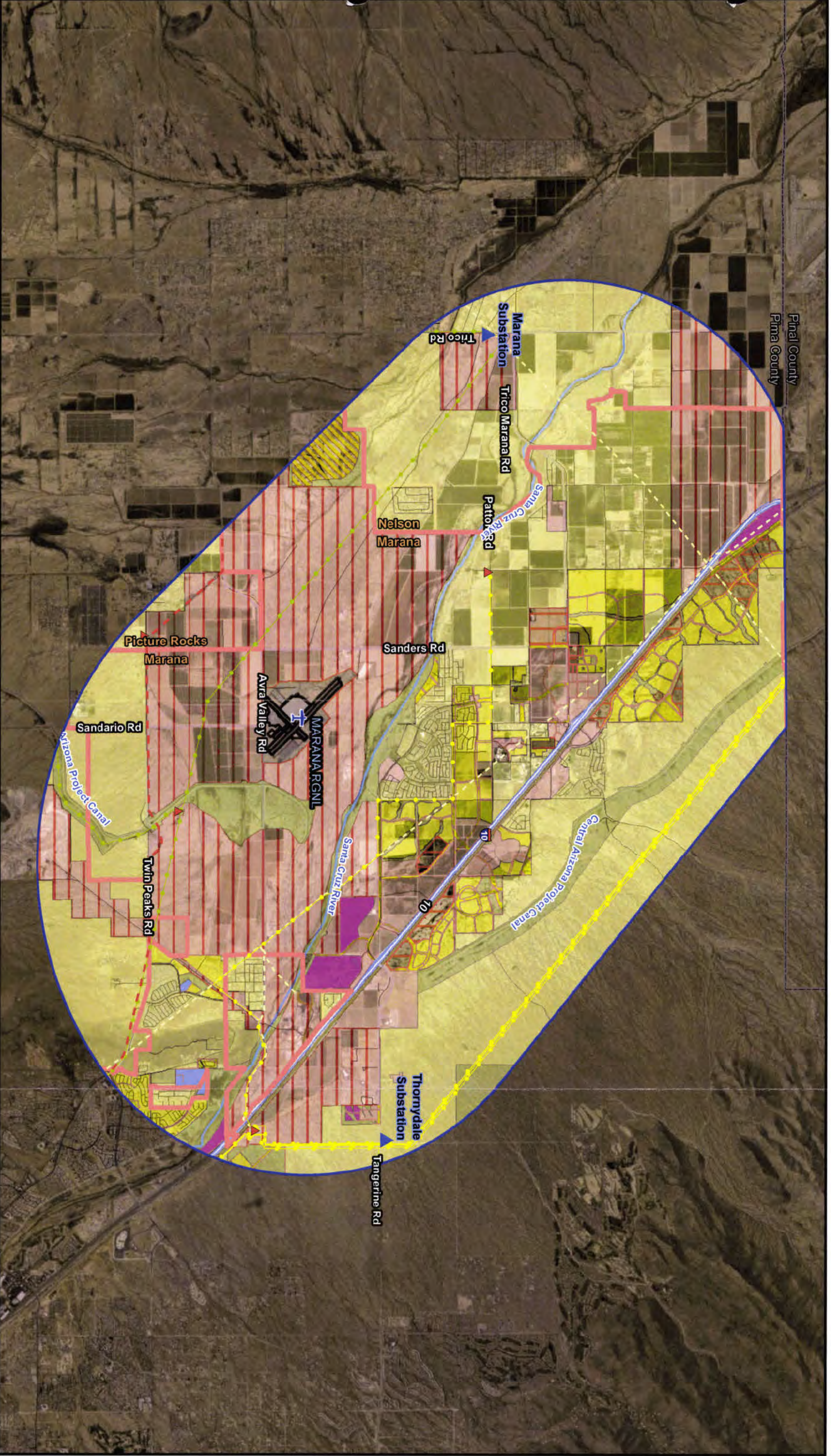
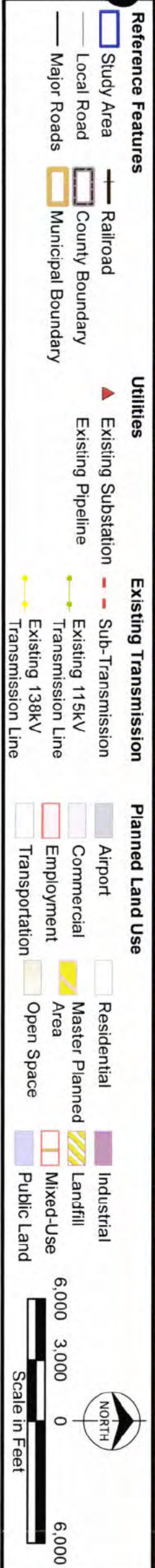


Figure 2  
Planned Land Use  
Marana - Thornydale Project  
Arizona G&T Cooperatives  
Draft - Not for Construction

Source: ESRI, Burns & McDonnell

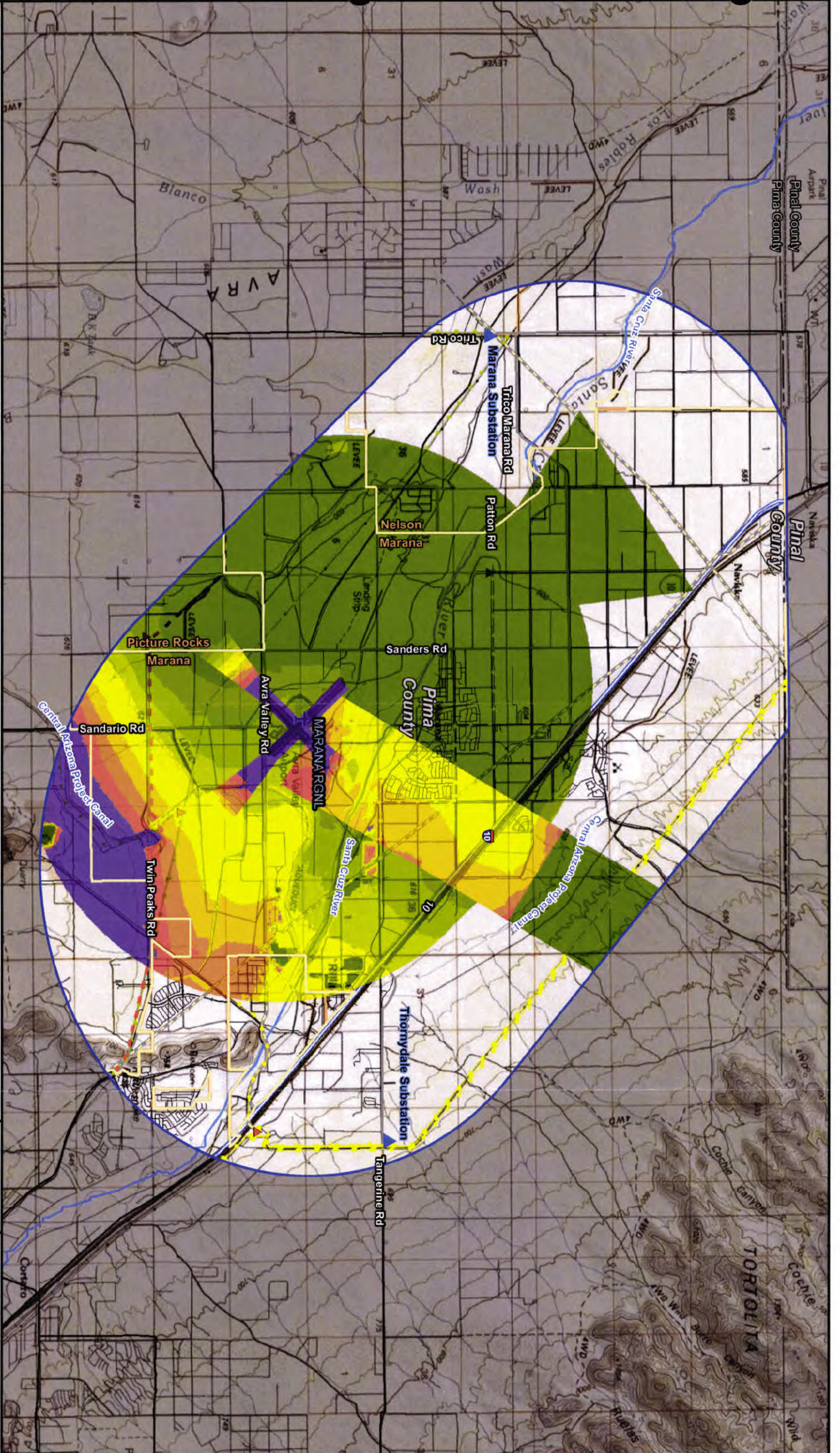
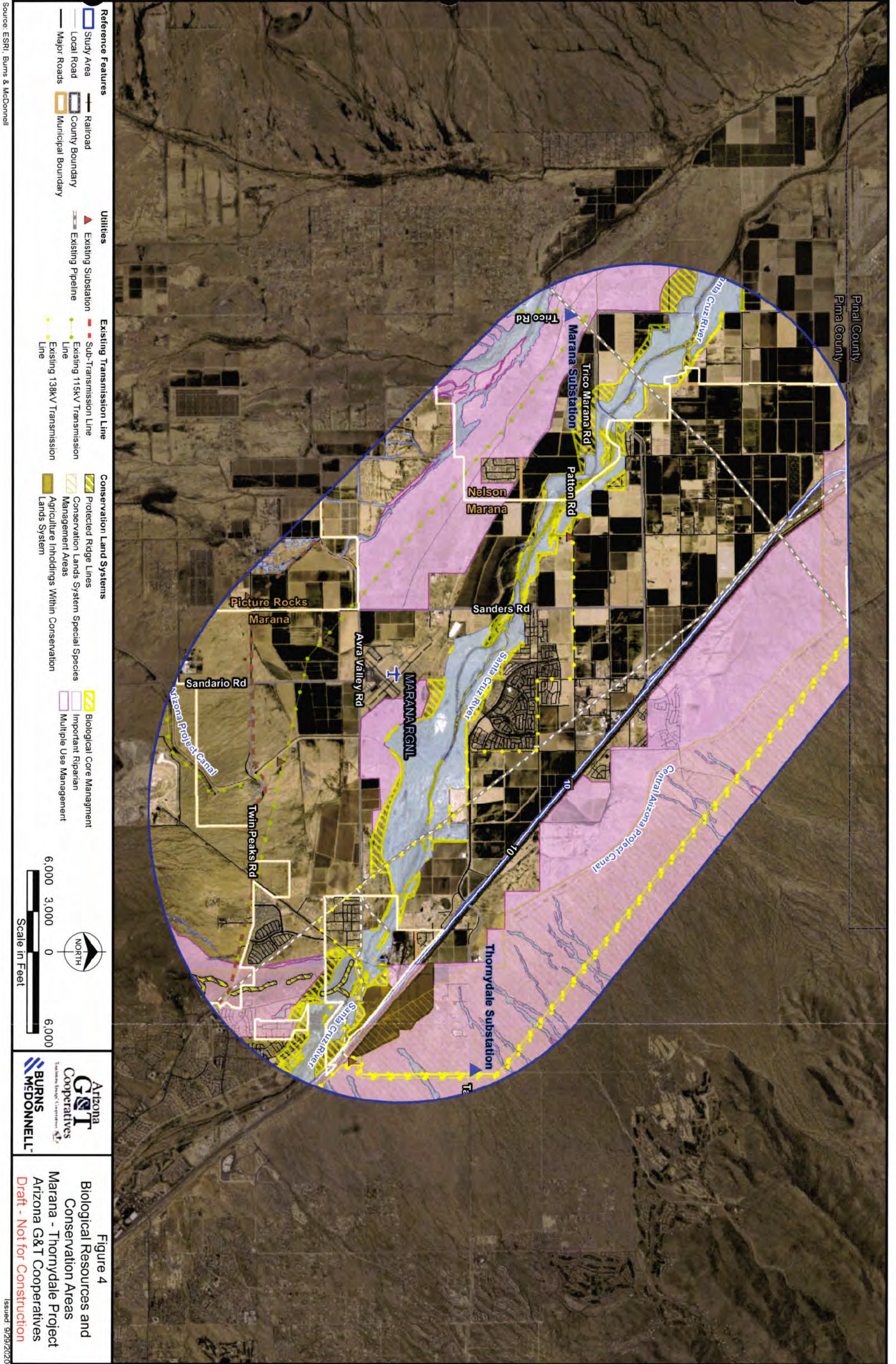


Figure 3

FAA Marana Airport  
Height Restrictions  
Marana - Thornydale Project  
Arizona G&T Cooperatives  
Draft - Not for Construction



### 3.3 Opportunities and Constraints Analysis

The opportunities and constraints analysis was completed to determine the most suitable locations within the study area for construction and operation of the proposed 115-kV transmission line. The objective of the opportunities and constraints analysis was to determine:

- locations that minimize impacts to sensitive resource areas (existing residences, schools, airports, etc.)
- locations that maximize the use of existing siting opportunities (existing power lines, roads, canals, etc.)

The criteria used to conduct the opportunities and constraints analysis is based upon the premise that each inventoried land use type has an inherent level of sensitivity (i.e., constraints) to the introduction of a new transmission line. Typically, the higher the level of sensitivity of a land use type, the lower the compatibility with a new transmission line. The sensitivity levels have been derived from experience with past projects and includes input from planning professionals, agencies, and the public. This opportunities and constraints analysis has been accepted by federal, state, and municipal planning and regulatory agencies for the development of energy and utility infrastructure.

Sensitivity levels range from low to high sensitivity. Typically, residential land use would be less compatible than a commercial or industrial use because power lines and substation sites could resemble some of the facilities or uses at commercial or industrial facilities (e.g., light towers, communication towers).

Additionally, transportation corridors, existing power line corridors, section lines, half-section lines, and other linear facilities were considered opportunities for locating the proposed 115-kV transmission line.

Previous studies have been conducted to help identify areas that better lend themselves to accommodate this transmission line (opportunities) and locations that would be less accommodating for the transmission line (constraints). The criteria shown in the opportunities and constraints table below assists in identifying route opportunities for the construction, operation, and maintenance of the new 115-kV transmission line, and minimizes impacts of the line to residences or other sensitive areas. For example, an arterial roadway would be considered a high-ranking opportunity to locate the new power line. However, that same arterial road would rank lower in a residential community (an area of high constraint) than it would within a commercial zone (an area of moderate constraint). The criteria used in identifying locations of opportunity and constraints are listed in Table 3-1.

**Table 3-1: Opportunities and Constraints Criteria**

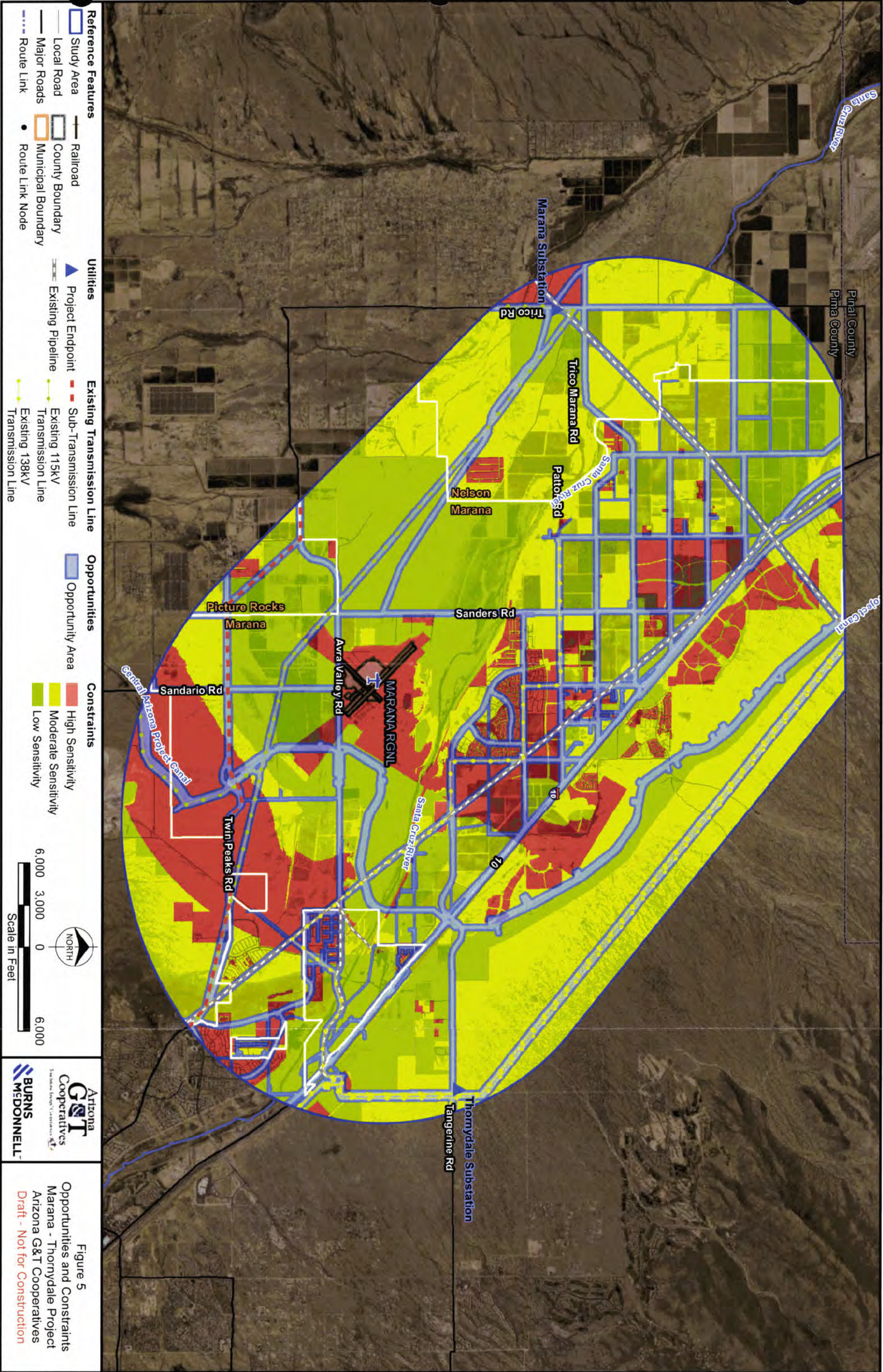
<b>Existing Land Use Constraints</b>	
<b>Category</b>	<b>Sensitivity Level</b>
Residential Low Density	High
Residential Medium Density	High
Residential High Density	High
Subdivision Under Construction	High
Schools/Educational Facilities	High
Parks, Trails, and Designated Scenic Roads	High
Recreation (golf course, racetrack, paintball park, etc.)	Moderate
Open Space/Greenbelt	Moderate
Commercial	Moderate
Public/Quasi-Public	Moderate
Transportation (Roadways)	Moderate
Agriculture/Corral/Stock Tank	Low
Construction Laydown Area/Nursery	Low
Industrial/Mining	Low
Canal	Low
Utility Facilities (substations, pump stations, water treatment, communications, flood control, etc.)	Low
<b>Planned Land Use Constraints</b>	
<b>Category</b>	<b>Sensitivity Level</b>
Residential – Final Plat	High
Residential – Preliminary Plat	Moderate
Residential – General Plan	Moderate
Commercial – Final Plat	Moderate
Commercial – Preliminary Plat	Low
Commercial – General Plan	Low
Commercial, Resort/Hotel – General Plan	Moderate
Commercial, Mixed Use – General Plan	Low
School/Education Facilities – Final Plat	High
Schools/Education Facilities – General Plan	Moderate
Industrial – General Plan	Low

Planned Land Use Constraints	
Category	Sensitivity Level
Transportation (Roadways) – Final Plat	Moderate
Transportation (Roadways) – Preliminary Plat	Low
Transportation (Roadways) – General Plan	Low
Recreation Trail – General Plan	Moderate
Park/Golf Course – Final Plat	Moderate
Park/Golf Course – General Plan	Low
Open Space – Final Plat	Moderate
Open Space – Preliminary Plat	Low
Open Space – General Plan	Low
Preserve – General Plan	Moderate
Public/Quasi-Public – General Plan	Low
Opportunities	
Category	Opportunity Level
Overhead Transmission Line Corridors	High
Overhead 12-kV Distribution Line (suitable for co-location)	High
Canal	High
Highways (State Route)	High
Arterial Roadways	High
Utility Facilities (substations, pump stations, water treatment, communications., flood control, etc.)	High

Existing and planned land use data was used to identify areas that are most suitable for construction of the proposed 115-kV transmission lines. The results of the sensitivity analysis are shown on Figure 5 (Opportunities and Constraints) below and illustrate a composite of all the opportunities and constraints within the study area. Opportunity areas, including following existing power lines and major roadways, are shown in blue. Areas with low sensitivity, including industrial or undeveloped areas, are shown in green; areas with moderate sensitivity, such as commercial areas or business parks, are shown in yellow; and areas with high sensitivity, such as residential areas and schools, are shown in red.

### 3.4 Alternatives Identification

The results of the opportunities and constraints analysis were used to assist with the identification of alternative route links, which are illustrated on Figure 6 (Alternative Route Links).



Reference Features

Study Area

Local Road

Major Roads

Railroad

County Boundary

Municipal Boundary

Utilities

Existing Substation

Existing Pipeline

Existing Transmission Line

Sub-Transmission Line

Existing 115kV Transmission Line

Existing 138kV Transmission Line

Alternative

Route Link

Route Link

Route Link Number

6,000

3,000

0

6,000

Scale in Feet

NORTH

Arizona G&T Cooperatives

BURNS MEDONNELL

Figure 6

Alternative Route Links

Marana - Thornydale Project

Arizona G&T Cooperatives

Draft - Not for Construction

Issued: 9/29/2020

Links are defined as short segments of potential transmission line alignment that are subsequently combined to form routes (connections) between two substations. The map illustrates a composite of all the opportunities and constraints within the study area along with the alternative route links that were identified. Alternative route links were added along many of the opportunity areas (e.g. power lines, section lines, roadways) where adjacent land uses had low to moderate sensitivity levels. In some cases, alternative links crossed land uses with high sensitivity to connect to other links required to form a complete route. Overall, the alternative links would be considered reasonably compatible with the existing and planned land uses, especially in areas with existing power lines and road right-of-way that can be utilized for construction and operation of the proposed 115-kV transmission line.

The alternatives links and the associated existing land use and planned land use and are listed in Table 3-2 below.

**Table 3-2: Alternative Route Link Summary**

<b>Alternative Route Link Number (Miles)</b>	<b>Existing Land Use</b>	<b>Planned Land Use</b>	<b>Constraints Sensitivity Level (Feet) (split between resource types)</b>	<b>Comments</b>
5 (0.19 miles)	Vacant/Undeveloped	Employment	Low (990)	
10 (0.15 miles)	Vacant/Undeveloped	Employment	Low (810)	
15 (0.25 miles)	Vacant/Undeveloped	Employment	Low (1340)	
20 (2 miles)	Road, Vacant/Undeveloped	Employment, Rural Residential	Moderate (3600), Low (6940)	
25 (0.12 miles)	Agricultural, Vacant/Undeveloped	Employment	Low (650)	
30 (0.13 miles)	Vacant/Undeveloped	Employment	Low (710)	
35 (1.03 miles)	Agricultural, Road, Vacant/Undeveloped	Employment, Rural Residential	Moderate (5370), Low (40)	
40 (0.31 miles)	Agricultural	Employment	Low (1660)	
45 (0.29 miles)	Agricultural, Vacant/Undeveloped	Employment	Low (1550)	
50 (0.23 miles)	Vacant/Undeveloped	Employment	Low (1210)	
55 (2.97 miles)	Agricultural, Public/Institutional,	Rural Residential,	Moderate (15690)	Santa Cruz River Crossing

<b>Alternative Route Link Number (Miles)</b>	<b>Existing Land Use</b>	<b>Planned Land Use</b>	<b>Constraints Sensitivity Level (Feet) (split between resource types)</b>	<b>Comments</b>
	Road, Vacant/Undeveloped	Traditional Neighborhood		
60 (1.38 miles)	Agricultural, Vacant/Undeveloped	Rural Residential, Traditional Neighborhood	Moderate (7300)	Santa Cruz River Crossing
65 (1.49 miles)	Agricultural, Road, Vacant/Undeveloped	Employment, Rural Residential, Traditional Neighborhood	Moderate (7810), Low (60)	Santa Cruz River Crossing
70 (0.98 miles)	Agricultural, Vacant/Undeveloped	Employment, Rural Residential	Moderate (1610), Low (3550)	
75 (2.8 miles)	Agricultural, Public/Institutional, Residential, Rivers, Major Washes and Drainage Basins, Vacant/Undeveloped	Employment, Rural Residential, Traditional Neighborhood	High (330), Moderate (10750), Low (3700)	Santa Cruz River Crossing
80 (1.58 miles)	Road, Vacant/Undeveloped	Employment, Rural Residential	Moderate (3740), Low (4620)	
85 (0.85 miles)	Agricultural, Road	Traditional Neighborhood	Moderate (4480)	
90 (0.6 miles)	Agricultural, Road	Traditional Neighborhood	Moderate (3170)	
95 (0.34 miles)	Residential, Rivers, Major Washes and Drainage Basins, Road, Vacant/Undeveloped	Rural Residential, Traditional Neighborhood	High (50), Moderate (1750)	
100 (1.03 miles)	Rivers, Major Washes and Drainage Basins, Vacant/Undeveloped	Rural Residential, Traditional Neighborhood	Moderate (5440)	Santa Cruz River Crossing
105 (0.72 miles)	Agricultural, Residential, Road	Traditional Neighborhood	High (1250), Moderate (2520)	Santa Cruz River Crossing
110 (0.8 miles)	Residential, Rivers, Major Washes and Drainage Basins, Road, Vacant/Undeveloped	Rural Residential, Traditional Neighborhood	High (1470), Moderate (2750)	

<b>Alternative Route Link Number (Miles)</b>	<b>Existing Land Use</b>	<b>Planned Land Use</b>	<b>Constraints Sensitivity Level (Feet) (split between resource types)</b>	<b>Comments</b>
115 (3.78 miles)	Agricultural, Road, Vacant/Undeveloped	Employment, Low Density Residential, Rural Residential	Moderate (9260), Low (13640)	
120 (2.03 miles)	Road, Vacant/Undeveloped	Employment, Rural Residential	Moderate (4570), Low (6140)	
125 (0.36 miles)	Agricultural	Traditional Neighborhood	Moderate (1890)	
130 (0.6 miles)	Agricultural	Traditional Neighborhood	Moderate (3140)	
135 (0.11 miles)	Agricultural	Traditional Neighborhood	Moderate (560)	
140 (0.5 miles)	Agricultural, Road	Traditional Neighborhood	Moderate (2660)	
145 (1.1 miles)	Agricultural, Commercial, Residential, Road	Master Planned Area, Medium Low Density Residential, Traditional Neighborhood	High (280), Moderate (5530)	
150 (0.36 miles)	Agricultural, Road	Traditional Neighborhood	Moderate (1900)	
155 (0.04 miles)	Agricultural, Road	Traditional Neighborhood	Moderate (220)	
160 (0.75 miles)	Agricultural	Employment, Traditional Neighborhood	Moderate (100), Low (3850)	
165 (0.75 miles)	Agricultural	Employment, Traditional Neighborhood	Moderate (2980), Low (990)	
170 (1.07 miles)	Agricultural, Road	Master Planned Area, Medium Low Density Residential, Traditional Neighborhood	High (30), Moderate (5650)	
175 (0.31 miles)	Agricultural, Rivers, Major Washes and Drainage Basins	Traditional Neighborhood	Moderate (1610)	
180 (0.48 miles)	Agricultural, Road	Employment, Medium Low Density Residential	High (40), Moderate (20), Low (2450)	

<b>Alternative Route Link Number (Miles)</b>	<b>Existing Land Use</b>	<b>Planned Land Use</b>	<b>Constraints Sensitivity Level (Feet) (split between resource types)</b>	<b>Comments</b>
185 (0.53 miles)	Agricultural, Road	Traditional Neighborhood	Moderate (2820)	
190 (0.51 miles)	Agricultural, Road	Medium Low Density Residential, Traditional Neighborhood	High (40), Moderate (2630)	
195 (0.5 miles)	Agricultural	Traditional Neighborhood	Moderate (2660)	
200 (1.36 miles)	Agricultural, Road, Vacant/Undeveloped	Employment	Moderate (270), Low (6900)	
205 (2.48 miles)	Agricultural, Residential, Road, Vacant/Undeveloped	Employment	High (660), Moderate (1310), Low (11120)	
210 (0.5 miles)	Agricultural, Public/Institutional	Traditional Neighborhood	Moderate (2630)	
215 (1.01 miles)	Agricultural, Public/Institutional, Road, Vacant/Undeveloped	Traditional Neighborhood	Moderate (5320)	
220 (0.53 miles)	Agricultural, Road, Vacant/Undeveloped	Medium Low Density Residential, Traditional Neighborhood	High (40), Moderate (2760)	
225 (1.02 miles)	Agricultural, Commercial, Public/Institutional, Road	Master Planned Area, Mixed Use, Traditional Neighborhood	Moderate (5360)	
230 (0.47 miles)	Agricultural	Medium Low Density Residential	High (2490)	
235 (1 miles)	Agricultural, Road	Commercial, Master Planned Area, Medium Density Residential, Medium High Density Residential, Medium Low Density	High (4060), Moderate (1070), Low (160)	

<b>Alternative Route Link Number (Miles)</b>	<b>Existing Land Use</b>	<b>Planned Land Use</b>	<b>Constraints Sensitivity Level (Feet) (split between resource types)</b>	<b>Comments</b>
		Residential, Mixed Use, Open Space		
240 (0.5 miles)	Agricultural	Medium Low Density Residential	High (2610)	
245 (1 miles)	Agricultural, Road	Low-Medium Density Residential, Master Planned Area, Medium Density Residential, Medium Low Density Residential, Open Space	High ( 4910), Moderate (180), Low (200)	
250 (0.5 miles)	Agricultural	Master Planned Area, Medium Low Density Residential	High (2590), Moderate (70)	
255 (1.06 miles)	Agricultural, Road, Vacant/Undeveloped	I-10 Corridor, Master Planned Area, Medium Density Residential, Medium Low Density Residential, Mixed Use, Open Space	High (4710), Moderate (700), Low (200)	Interstate 10 Crossing
260 (0.63 miles)	Agricultural, Road, Vacant/Undeveloped	I-10 Corridor, Medium Density Residential, Medium Low Density Residential, Open Space	High (2630), Moderate (620), Low (90)	Interstate 10 Crossing
265 (1.54 miles)	Agricultural, Road	Employment	High (670), Moderate	Significant FAA Restrictions (Poles limited to less than 80 feet tall)

<b>Alternative Route Link Number (Miles)</b>	<b>Existing Land Use</b>	<b>Planned Land Use</b>	<b>Constraints Sensitivity Level (Feet) (split between resource types)</b>	<b>Comments</b>
			(1360), Low (6110)	
270 (0.8 miles)	Agricultural	Employment	Low (4220)	
275 (1.32 miles)	Agricultural, Road	Employment	Moderate (140), Low (6830)	
280 (1.77 miles)	Agricultural, Road, Vacant/Undeveloped	Employment	Moderate (150), Low (9180)	
285 (0.28 miles)	Vacant/Undeveloped	Master Planned Area, Medium-Low Density Residential, Mixed Use, Open Space	High (90), Moderate (670), Low (730)	
290 (0.22 miles)	Vacant/Undeveloped	Mixed Use, Open Space	Moderate (970), Low (160)	
295 (0.18 miles)	Vacant/Undeveloped	Master Planned Area, Medium-Low Density Residential, Mixed Use	High (60), Moderate (900)	
300 (1.57 miles)	Public/Institutional, Vacant/Undeveloped	Master Planned Area, Medium-Low Density Residential, Mixed Use, Open Space, Traditional Neighborhood	High (1590), Moderate (5180), Low (1500)	
305 (0.41 miles)	Vacant/Undeveloped	Mixed Use	Moderate (2150)	
310 (0.92 miles)	Vacant/Undeveloped	Mixed Use	Moderate (2520)	
315 (0.53 miles)	Agricultural, Residential, Road, Vacant/Undeveloped	Master Planned Area, Traditional Neighborhood	High (240), Moderate (2550)	

Alternative Route Link Number (Miles)	Existing Land Use	Planned Land Use	Constraints Sensitivity Level (Feet) (split between resource types)	Comments
320 (3.19 miles)	Agricultural, Residential, Road, Vacant/Undeveloped	Commercial, Employment Center, Master Planned Area, Medium Density Residential, Medium High Density Residential, Town Center High Density District, Town Center Institutional District, Traditional Neighborhood	High (9870), Moderate (6940)	Significant FAA Restrictions (Poles limited to less than 80 feet tall); Interstate 10 Crossing
325 (0.5 miles)	Agricultural, Road	Master Planned Area, Mixed Use	Moderate (2630)	
330 (1.88 miles)	Agricultural, Public/Institutional, Residential, Road, Vacant/Undeveloped	Commercial, Downtown Zone, Employment Center, I-10 Corridor, Master Planned Area, Residential, Traditional Neighborhood	High (1510), Moderate (8370), Low (80)	Interstate 10 Crossing
335 (0.48 miles)	Agricultural	Low-Medium Density Residential, Master Planned Area, Mixed Use, Open Space	High (1400), Moderate (990), Low (120)	
340 (1.16 miles)	Agricultural, Road, Vacant/Undeveloped	Commercial, I-10 Corridor, Master Planned Area, Mixed Use, Neighborhood Commercial, Regional Commercial	Moderate (4230), Low (1850)	Interstate 10 Crossing

Alternative Route Link Number (Miles)	Existing Land Use	Planned Land Use	Constraints Sensitivity Level (Feet) (split between resource types)	Comments
345 (0.71 miles)	Agricultural, Road, Vacant/Undeveloped	I-10 Corridor, Low-Medium Density Residential, Master Planned Area, Mixed Use, Open Space, Regional Commercial	High (1650), Moderate (1940), Low (150)	Interstate 10 Crossing
350 (0.48 miles)	Agricultural, Vacant/Undeveloped	Employment	Low (2520)	
355 (0.73 miles)	Vacant/Undeveloped	Employment	Low (3840)	
360 (2.64 miles)	Public/Institutional, Road, Vacant/Undeveloped	Employment, Open Space	High (11200), Moderate (2310), Low (390)	Significant FAA Restrictions (Poles limited to less than 80 feet tall)
365 (1.33 miles)	Public/Institutional, Residential, Vacant/Undeveloped	Master Planned Area, Mixed Use, Open Space, Traditional Neighborhood	High (710), Moderate (5990), Low (310)	
370 (1.54 miles)	Commercial, Industrial, Public/Institutional, Road, Vacant/Undeveloped	Commercial, Master Planned Area, Mixed Use, Open Space	Moderate (3200), Low (4930)	
375 (0.97 miles)	Public/Institutional, Vacant/Undeveloped	Employment, Open Space	Low (5120)	
380 (2.05 miles)	Public/Institutional, Vacant/Undeveloped	Employment, Open Space	High (7940), Moderate (1790), Low (1100)	Significant FAA Restrictions (Poles limited to less than 80 feet tall)
385 (2.21 miles)	Public/Institutional, Rivers, Major Washes and Drainage Basins, Vacant/Undeveloped	Open Space, Rural Residential	Moderate (10350), Low (1290)	
390 (1.21 miles)	Public/Institutional	Open Space	Low (6410)	
395 (1.52 miles)	Public/Institutional, Road, Vacant/Undeveloped	Commercial, Open Space,	High (3480), Moderate	Significant FAA Restrictions (Poles limited to less than 80 feet tall)

<b>Alternative Route Link Number (Miles)</b>	<b>Existing Land Use</b>	<b>Planned Land Use</b>	<b>Constraints Sensitivity Level (Feet) (split between resource types)</b>	<b>Comments</b>
		Traditional Neighborhood	(3680), Low (890)	
400 (1.54 miles)	Residential, Road, Vacant/Undeveloped	Commercial, Master Planned Area, Medium Density Residential, Office/Business 1, Office/Business 3, Open Space, Open Space/Drainage, Traditional Neighborhood	High (2260), Moderate (5210), Low (660)	Significant FAA Restrictions (Poles limited to less than 80 feet tall)
405 (1.2 miles)	Public/Institutional, Rivers, Major Washes and Drainage Basins, Vacant/Undeveloped	Open Space, Rural Residential	Moderate (3990), Low (2340)	
410 (1.77 miles)	Public/Institutional	Open Space	Low (9370)	
415 (1.72 miles)	Agricultural, Commercial, Industrial, Parks, Recreation and Open Space, Public/Institutional, Rivers, Major Washes and Drainage Basins, Road, Vacant/Undeveloped	Employment, Open Space	High (270), Moderate (1620), Low (7170)	Santa Cruz River Crossing
420 (1.11 miles)	Agricultural, Public/Institutional, Road, Vacant/Undeveloped	Employment, Open Space	High (40), Moderate (3070), Low (2760)	Significant FAA Restrictions (Poles limited to less than 80 feet tall)
425 (0.75 miles)	Industrial, Parks, Recreation and Open Space, Rivers, Major Washes and Drainage Basins, Vacant/Undeveloped	Employment, Open Space	High (200), Moderate (40), Low (3690)	Santa Cruz River Crossing
430 (0.83 miles)	Vacant/Undeveloped	Employment	Low (4380)	

<b>Alternative Route Link Number (Miles)</b>	<b>Existing Land Use</b>	<b>Planned Land Use</b>	<b>Constraints Sensitivity Level (Feet) (split between resource types)</b>	<b>Comments</b>
435 (0.32 miles)	Agricultural, Road, Vacant/Undeveloped	Employment, Master Planned Area	Moderate (1680)	
440 (0.42 miles)	Agricultural, Industrial, Road, Vacant/Undeveloped	Employment, Master Planned Area, Regional Retail Center	Moderate (440), Low (1750)	
445 (0.73 miles)	Agricultural	Auto Park, Master Planned Area	Moderate (3870)	
450 (0.27 miles)	Agricultural, Vacant/Undeveloped	Auto Park, Master Planned Area, Regional Retail Center	Moderate (1420)	
455 (0.13 miles)	Road, Vacant/Undeveloped	I-10 Corridor, Master Planned Area	High (650)	Significant FAA Restrictions (Poles limited to less than 80 feet tall)
460 (0.27 miles)	Agricultural	Auto Park, Commercial	High (560), Moderate (850)	Significant FAA Restrictions (Poles limited to less than 80 feet tall)
465 (0.35 miles)	Road, Vacant/Undeveloped	Master Planned Area	High (540), Moderate (1320)	Significant FAA Restrictions (Poles limited to less than 80 feet tall)
470 (0.27 miles)	Vacant/Undeveloped	Mandarina Transportation Corridor, Master Planned Area	High (460), Moderate (950)	Significant FAA Restrictions (Poles limited to less than 80 feet tall)
475 (0.13 miles)	Agricultural, Vacant/Undeveloped	Auto Park, I-10 Corridor, Mandarina Transportation Corridor, Master Planned Area	Moderate (660)	
480 (0.5 miles)	Agricultural	Auto Park, Regional Retail Center	Moderate (2630)	
485 (0.45 miles)	Agricultural	Regional Retail Center	Moderate (2390)	
490 (0.71 miles)	Agricultural, Road	Master Planned Area, Regional Retail Center	Moderate (3750)	

<b>Alternative Route Link Number (Miles)</b>	<b>Existing Land Use</b>	<b>Planned Land Use</b>	<b>Constraints Sensitivity Level (Feet) (split between resource types)</b>	<b>Comments</b>
495 (0.23 miles)	Road, Vacant/Undeveloped	Mandarina Corridor, Mandarina Transportation Corridor, Master Planned Area	High (40), Moderate (1160)	
500 (0.5 miles)	Vacant/Undeveloped	Mandarina Transportation Corridor	Moderate (2630)	
505 (0.13 miles)	Agricultural, Vacant/Undeveloped	I-10 Corridor, Mandarina Transportation Corridor, Master Planned Area, Regional Retail Center	Moderate (670)	Interstate 10 Crossing
510 (0.56 miles)	Agricultural, Road	I-10 Corridor, Regional Retail Center	Moderate (2800), Low (150)	
515 (0.63 miles)	Public/Institutional, Vacant/Undeveloped	Master Planned Area, Open Space	Moderate (3050), Low (320)	
520 (1.58 miles)	Vacant/Undeveloped	Rural Residential	Moderate (8330)	
525 (1.06 miles)	Public/Institutional, Vacant/Undeveloped	Open Space, Rural Residential	Moderate (4310), Low (1270)	
530 (1.2 miles)	Public/Institutional	Open Space	Low (6330)	
535 (0.69 miles)	Public/Institutional, Road, Vacant/Undeveloped	Mandarina Transportation Corridor, Mandarina Village Center, Master Planned Area, Open Space	High (1500), Moderate (1470), Low (660)	
540 (0.74 miles)	Road, Vacant/Undeveloped	Commercial, Mandarina Transportation Corridor, Master Planned Area	Moderate (3710), Low (190)	

<b>Alternative Route Link Number (Miles)</b>	<b>Existing Land Use</b>	<b>Planned Land Use</b>	<b>Constraints Sensitivity Level (Feet) (split between resource types)</b>	<b>Comments</b>
545 (0.24 miles)	Agricultural, Vacant/Undeveloped	Commercial, I-10 Corridor, Regional Retail Center	Moderate (1130), Low (100)	Interstate 10 Crossing
550 (1.18 miles)	Agricultural, Industrial, Parks, Recreation and Open Space, Rivers, Major Washes and Drainage Basins, Road, Vacant/Undeveloped	Commerce Park, Commercial, Employment, I-10 Corridor, Master Planned Area, Open Space	High (670), Moderate (3080), Low (2480)	Significant FAA Restrictions (Poles limited to less than 80 feet tall); Interstate 10 Crossing, Santa Cruz River Crossing
555 (1.66 miles)	Agricultural, Industrial, Public/Institutional, Road, Vacant/Undeveloped	Buffer, Commercial, Employment, I-10 Corridor, Open Space, Traditional Neighborhood	High (600), Moderate (4010), Low (4150)	Significant FAA Restrictions (Poles limited to less than 80 feet tall); Interstate 10 Crossing
560 (1.74 miles)	Road, Vacant/Undeveloped	Employment	High (6320), Moderate (170), Low (2700)	Significant FAA Restrictions (Poles limited to less than 80 feet tall)
565 (1.66 miles)	Public/Institutional, Vacant/Undeveloped	Low Density Residential, Open Space	Moderate (7620), Low (1170)	
570 (0.56 miles)	Public/Institutional	Open Space	Low (2960)	
575 (0.27 miles)	Road, Vacant/Undeveloped	Commercial	Moderate (120), Low (1300)	
580 (0.15 miles)	Public/Institutional	Open Space	Low (790)	
585 (1.6 miles)	Vacant/Undeveloped	Low Density Residential, Rural Residential, Tortolita Preserve	Moderate (8480)	
590 (0.49 miles)	Public/Institutional, Road, Vacant/Undeveloped	Commercial, Open Space	Moderate (460), Low (2120)	
595 (1.82 miles)	Public/Institutional, Vacant/Undeveloped	Low Density Residential, Open Space	Moderate (11540), Low (200)	

<b>Alternative Route Link Number (Miles)</b>	<b>Existing Land Use</b>	<b>Planned Land Use</b>	<b>Constraints Sensitivity Level (Feet) (split between resource types)</b>	<b>Comments</b>
600 (1.98 miles)	Commercial, Road, Vacant/Undeveloped	Commercial, Low Density Residential	Moderate (13180)	
605 (2.35 miles)	Agricultural, Industrial, Road, Vacant/Undeveloped	Employment, I-10 Corridor, Low Density Residential, Open Space	Moderate (3530), Low (8850)	Interstate 10 Crossing
610 (2.9 miles)	Agricultural, Public/Institutional, Residential, Road, Vacant/Undeveloped	Employment, I-10 Corridor, Low Density Residential, Open Space	High (2200), Moderate (2750), Low (10370)	Interstate 10 Crossing
615 (0.76 miles)	Vacant/Undeveloped	Low Density Residential	Moderate (4020)	
620 (0.52 miles)	Public/Institutional, Vacant/Undeveloped	Low Density Residential	Moderate (2730)	
625 (0.53 miles)	Road, Vacant/Undeveloped	Low Density Residential	Moderate (2770)	
630 (0.06 miles)	Public/Institutional, Vacant/Undeveloped	Low Density Residential	Moderate (330)	

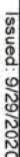
## 4.0 PRELIMINARY ROUTES

After identification of the alternative links and field review, there were four preliminary routes identified for AzGT to consider for more detailed studies and permitting (Figure 7).

Route 1 is approximately 14.7 miles long and is the northernmost route. It begins at the Marana Substation, crossing through primarily agricultural lands west of Interstate 10, and then crosses into undeveloped desert and parallels a major existing transmission line corridor through the desert into the Thornydale Substation. Crossing the Santa Cruz River corridor would be very short and within a cleared area with an existing paved roadway/bridge and existing overhead transmission line. This route follows major roadways or gravel service roads throughout the agricultural lands and follows a two-track dirt road along the transmission line that is in very good condition. The route did not appear to have any notable conflicts with existing or planned land uses identified to date.

Route 2, which is approximately 13.1 miles, starts at the Marana Substation and also crosses through primarily agricultural lands west of Interstate 10 and then crosses into undeveloped desert and parallels a major existing transmission line corridor through the desert into the Thornydale Substation. Crossing the Santa Cruz River corridor would be very short and within a cleared area with an existing paved roadway/bridge and existing overhead transmission line. This route follows major roadways or gravel service roads throughout the agricultural lands and follows a two-track dirt road along the transmission line that is in very good condition. The route may potentially have a few more conflicts with existing rural residences and agricultural operations along West Sagebrush Road. The route would also be next to a residential subdivision located just east of Interstate 10 along West Chochie Canyon Trail.

Route 3 is approximately 11.1 miles long and is the shortest route identified in the study. Starting at the Marana Substation, this route crosses through primarily agricultural lands west of Interstate 10 and then crosses into undeveloped desert and parallels a major existing transmission line corridor through the desert into the Thornydale Substation. Crossing the Santa Cruz River corridor would be much longer, as the river corridor/floodplain is much wider (<1 mile) and may require more vegetation clearing and disturbance. This route follows major roadways or gravel service roads throughout the agricultural lands and follows a two-track dirt road along the transmission line that is in very good condition. The route may potentially have a few more conflicts with existing land uses, including residences and commercial development, especially along the north side of West Barnett Road. The route may also have more potential conflict with planned residential and commercial development that is expected along West Barnett Road and Interstate 10.



Route 4 is the longest route and travels southward around the Marana Regional Airport. Starting at the Marana Substation, this route crosses through primarily desert and agricultural lands west of Interstate 10 and then crosses into more developed commercial and industrial land near Interstate 10. Crossing the Santa Cruz River is relatively short and is adjacent to a landfill and sand/gravel operations. This route follows a two-track dirt road along an existing transmission line west of Marana Regional Airport that is in very good condition. The future development around the airport is commercial or business park and would be relatively compatible, especially with the existing transmission line corridor. One of the key concerns with this route is the proximity to the flight lines associated with aircraft landing and departure from the airport. There may need to be lower structure height design considerations and approval from the FAA before this route could be constructed.

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

The proposed 115-kV transmission line will require preparation of a CEC application for approval of a route. This application will be submitted to the Arizona Power Plant and Transmission Line Siting Committee for review and finally to the ACC for approval. The application will require specific engineering and environmental studies to be deemed complete before a decision is rendered regarding the Project.

Each of the preliminary routes described in this report would generally be considered feasible based upon studies conducted to date. However, each of these routes would need to be studied in more detail prior to deciding which route and any alternatives would be carried forward for permitting. The following items are recommended to be completed in the next phase and will assist in preparing a complete CEC application that can be approved by the ACC.

- Environmental inventory, impact assessment and mitigation planning studies.
- Environmental surveys for biological and cultural resources.
- Engineering/design, constructability, right-of-way, and cost studies.
- Agency, landowner, and public outreach to gather input and gain support for the Project.



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*Exhibit B-2 – Cultural Resources Class I Survey Report*

# A Cultural Resources Assessment for the Saguaro to Marana 115/138kV Transmission Line Project Study Area

Prepared for: Arizona G&T Cooperatives of Arizona Electric Power Cooperative, Inc.  
Prepared by: WestLand Engineering & Environmental Services  
Date: March 23, 2022; Revised April 13, 2022  
Project No./Report No.: 1608.36/2022-053

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Figure 6	Overlay of the Study Area on the 1967 1:24,000 (7.5' series) Marana, Arizona USGS quadrangle

## Appendices

Appendix A.	Archaeological Records Search
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## 1. INTRODUCTION

Arizona G&T Cooperatives of Arizona Electric Power Cooperative, Inc., contracted WestLand Engineering & Environmental Services (WestLand) to conduct a cultural resources assessment of the Saguaro to Marana 115/138kV Transmission Line Project Study Area to determine whether portions of the Study Area had been previously surveyed for cultural resources, to determine whether historic properties eligible for inclusion or already listed in the Arizona or National Registers of Historic Places (A/NRHP) are present within the Study Area, and to provide recommendations concerning the potential of the Preliminary Routes to impact cultural resources.

The Study Area was defined as the series of Preliminary Routes plus a 1-mile buffer (**Figure 1**). The Study Area consists of approximately 19,600 acres of private, county, municipal, state, and Bureau of Reclamation lands within portions of Sections 1, 10–15, 22–27, and 34–36 of Township 11 South, Range 10 East; portions of Sections 7–24 and 27–30 of Township 11 South, Range 11 East; and Portions of Sections 18 and 19 of Township 11 South, Range 12 East, Gila and Salt River Baseline and Meridian, as depicted on the West of Marana and Marana, Arizona, U.S. Geological Survey (USGS) 7.5-minute quadrangles (**Figure 2.a–c**).

## 2. ARCHAEOLOGICAL RESEARCH AND RECORDS SEARCH

WestLand conducted a cultural resources assessment of the Study Area by reviewing existing cultural resources information in files available in the State of Arizona's online database AZSITE, the Archaeological Records Office of the Arizona State Museum (ASM), and the A/NRHP. As part of WestLand's archival records search, available General Land Office (GLO) plats and USGS quadrangle maps were examined for information pertinent to identifying potential archaeological resources or historic properties (i.e., sites, buildings, structures, objects, or districts greater than 50 years old) in the Study Area.

According to the records reviewed, 105 cultural resources inventories have been conducted within the Study Area (**see Appendix A, Figures A.1.a–c and Table A.1**). These inventories include large block surveys such as the Northern Tucson Basin Survey and numerous linear surveys for roads, transmission lines, pipelines, and aqueducts. Only 10 of the projects were conducted in the last 10 years, though additional projects conducted in the 2000s may also meet modern standards.

Within the Study Area, 185 archaeological sites have been previously recorded (**Figures A.2.a–c and Table A.2** [Appendix A]). Within the Study Area, 19 sites are associated with historical Euroamerican use of the area; 159 sites are prehistoric, with most attributed to the Hohokam; five sites have both prehistoric and historical components; and two sites are of unknown age and affiliation.

During the records check, the ASM informed WestLand that they are currently involved in efforts to consolidate a number of the sites within the Study Area. The revised consolidated boundaries are not yet

available but are likely to result in more areas being inside archaeological site boundaries, particularly along the northern Preliminary Route leaving the proposed Adonis Substation. The sites that will be consolidated by the ASM are identified in **Table A.2**.

A file search of the A/NRHP databases indicates that no sites listed on either register are located within the project area (National Park Service 2022; Arizona State Parks 2022).

### 3. HISTORICAL MAP REVIEW

GLO plats and USGS topographic quadrangles can be extremely helpful in tracing the historical development of a particular area, as well as in the field-identification of historical sites. To this end, WestLand reviewed the historical maps listed below dating between 1895 and 1967 to assess the presence of historical features that could potentially be considered historic properties or cultural resources.

- **GLO plat for Township 11 South, Range 12 East, Gila and Salt River Meridian, Arizona, surveyed in 1895 and officially filed 1-8-1897.** The plat does not depict any features within the Study Area.
- **GLO plat for Township 11 South, Range 12 East, Gila and Salt River Meridian, Arizona, surveyed in 1931–1932 and officially filed 12-21-1933.** The plat does not depict any features within the Study Area.
- **GLO plat for Township 11 South, Range 11 East, Gila and Salt River Meridian, Arizona, surveyed in 1895 and officially filed 1-8-1897 (Figure 3).** A number of roads are depicted in the Study Area, including the “Road from Picacho to Tucson” in Sections 7, 8, 16, 17, 22, and 23, as well as the Southern Pacific Railroad in Sections 7, 8, 16, 17, 21, 22, and 27. A corral labeled “Wakefield” is depicted in Sections 15 and 16. An irrigation ditch is also depicted extending from the corral and passing through Sections 15, 22, and 27 within the Study Area.
- **GLO plat for Township 11 South, Range 10 East, Gila and Salt River Meridian, Arizona, surveyed in 1911 and officially filed 4-15-1913 (Figure 4).** This plat depicts a roughly north-south road in Sections 10, 11, and 14 that leads to the Edwards Dobson well and house. Another road, oriented east-west, is depicted in Section 13 and a roughly northwest-southeast road is depicted in Section 25 and forks in the SW  $\frac{1}{4}$  of the section.
- **GLO plat for Township 11 South, Range 10 East, Gila and Salt River Meridian, Arizona, surveyed in 1911 and 1921–1922 and officially filed 9-25-1924 (Figure 5).** This plat depicts numerous roads in Sections 22–27 and 34, as well as possible fields in Sections 27, 34, and 35.

- **1967 1:24,000-scale (7.5' series) Marana, Arizona, USGS quadrangle (Figure 6).** This map depicts numerous roads and features throughout the Study Area, including Interstate 10 and its frontage road, the Southern Pacific Railroad and Marana Siding, and a number of buildings including residences and the Junior High School. Two pipelines are also depicted on this map. One pipeline is within Section 8, and the second crosses Sections 16, 21, and 22 within the Study Area. This map also depicts a borrow pit in Section 15, siphons in Sections 16 and 17, and wells in Sections 17 and 20.

#### 4. ASSESSMENT OF THE STUDY AREA

WestLand performed a cultural resources assessment to better inform the evaluation of Preliminary Routes for the Saguaro to Marana 115/138kV Transmission Line Project Study Area. In order to understand previous survey coverage and known archaeological site density, WestLand reviewed existing archaeological survey and site information available in the AZSITE archaeological database and at the ASM Archaeological Records Office and examined historical maps of the Study Area to assess the potential for additional historical sites that have not yet been recorded.

Approximately 49 percent of the Study Area has been previously surveyed for cultural resources. However, less than 5 percent has been surveyed within the past 10 years. Along the Preliminary Routes, approximately 19 miles (or 65 percent of the routes) have been previously surveyed, with less than 3 miles (or 9 percent of the routes) surveyed in the last 10 years. Many of the previous surveys date to the 1980s through the early 2000s, prior to the widespread adoption of GPS technology by cultural resources consultants. WestLand recommends that any previously unsurveyed portions of the Preferred Route, once it is determined, should be subjected to 100 percent pedestrian survey. Any surveys older than 10 years along the Preferred Route should be carefully evaluated against current standards, and resurvey is recommended for any areas that have not been surveyed to current standards.

Previous site records show that 185 archaeological sites have been recorded within the Study Area. NRHP eligibility was assessed for these sites based on available information in AZSITE. Of the 185 known sites, 37 have been determined or recommended eligible for listing in the A/NRHP, 23 have been determined or recommended not eligible for listing, 123 have been recommended unevaluated by previous records, and eligibility information was not available for two sites. WestLand recommends avoidance of eligible and unevaluated sites whenever feasible. Avoidance may be achieved by choosing a Preferred Route with the least archaeological impacts but also by adjusting transmission structure spans and routing access roads around sites. If any unevaluated sites cannot be avoided by the project, a testing plan should be developed and implemented in order to fully evaluate these sites and make eligibility recommendations. If any eligible archaeological sites cannot be avoided by the project, a Historic Properties Treatment Plan should be developed and implemented prior to ground disturbance.

Site density is highest in the eastern portion of the Study Area. AZ AA:12:251(ASM), the Marana Platform Mound Community, is a large prehistoric habitation center. The dissected alluvial fan surrounding AZ AA:12:251(ASM) is a dense archaeological landscape with recorded villages, farmsteads, rock pile fields, roasting pits, and other specialized activity areas. Subsurface cultural deposits and human remains are highly likely to be encountered through this area. The Preliminary Routes Segments 40 and 10 pass through this area, intersecting a number of sites as currently mapped. The ASM consolidation will result in even more of the segment falling within site boundaries. The east-to-west portion of Segment 40 also does not follow an existing disturbed right-of-way, as many other segments do. Avoidance of sites in this area is not likely to be possible; therefore, WestLand recommends that this northern route not be included in the Preferred Route.

## 5. REFERENCES

### Arizona State Parks

- 2022 State Register of Historic Places. Online database, <https://d2umhuunwbec1r.cloudfront.net/gallery/0004/0051/6C59BF0C13FB42FA9804DCA7A9F174D2/ARHP%20List.pdf>, accessed 14 March 2022.

### National Park Service

- 2022 National Register Database and Research. Online database, <https://www.nps.gov/subjects/nationalregister/database-research.htm>, accessed 14 March 2022.

## FIGURES

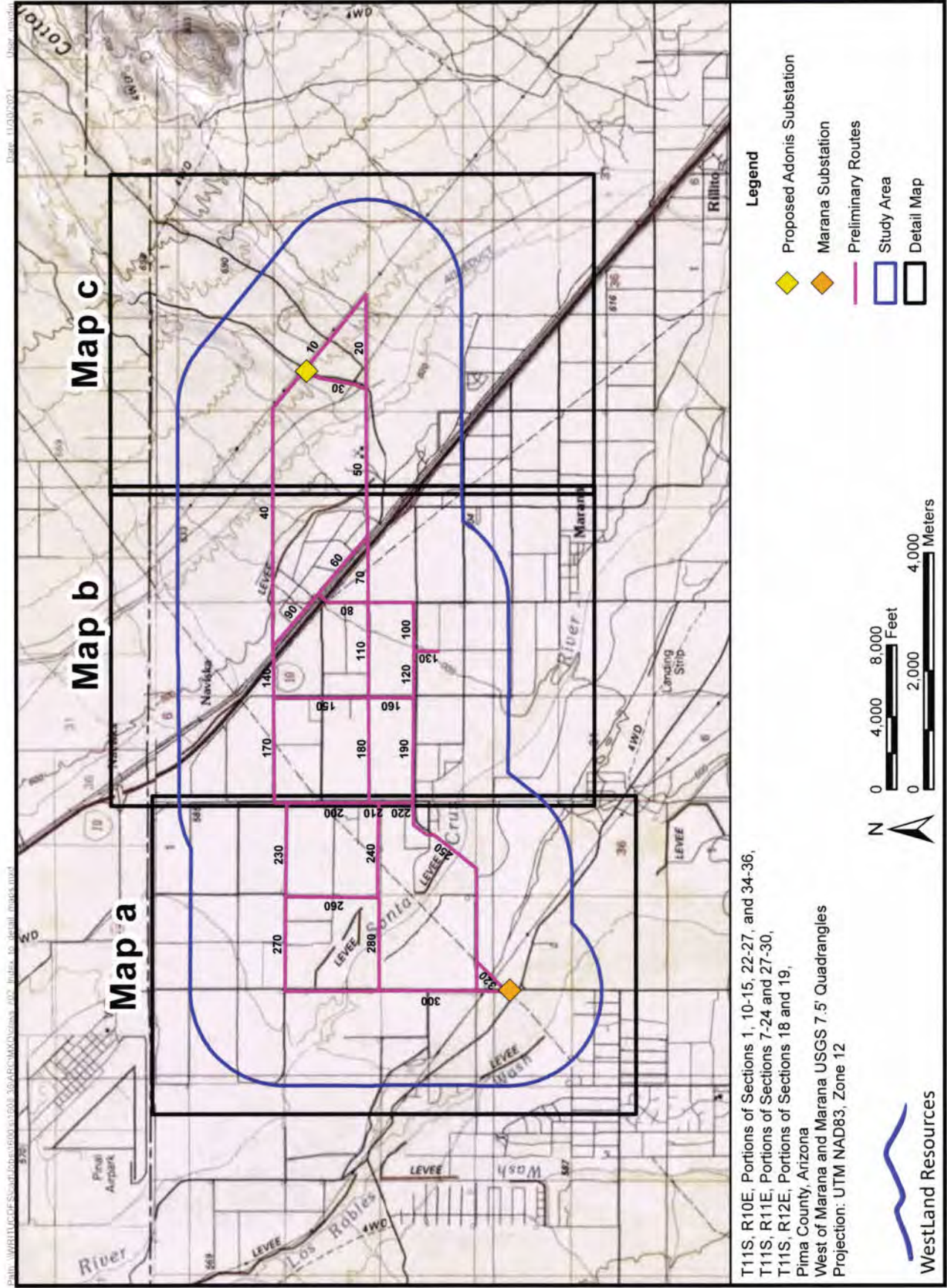


Figure 1. Index to detail maps

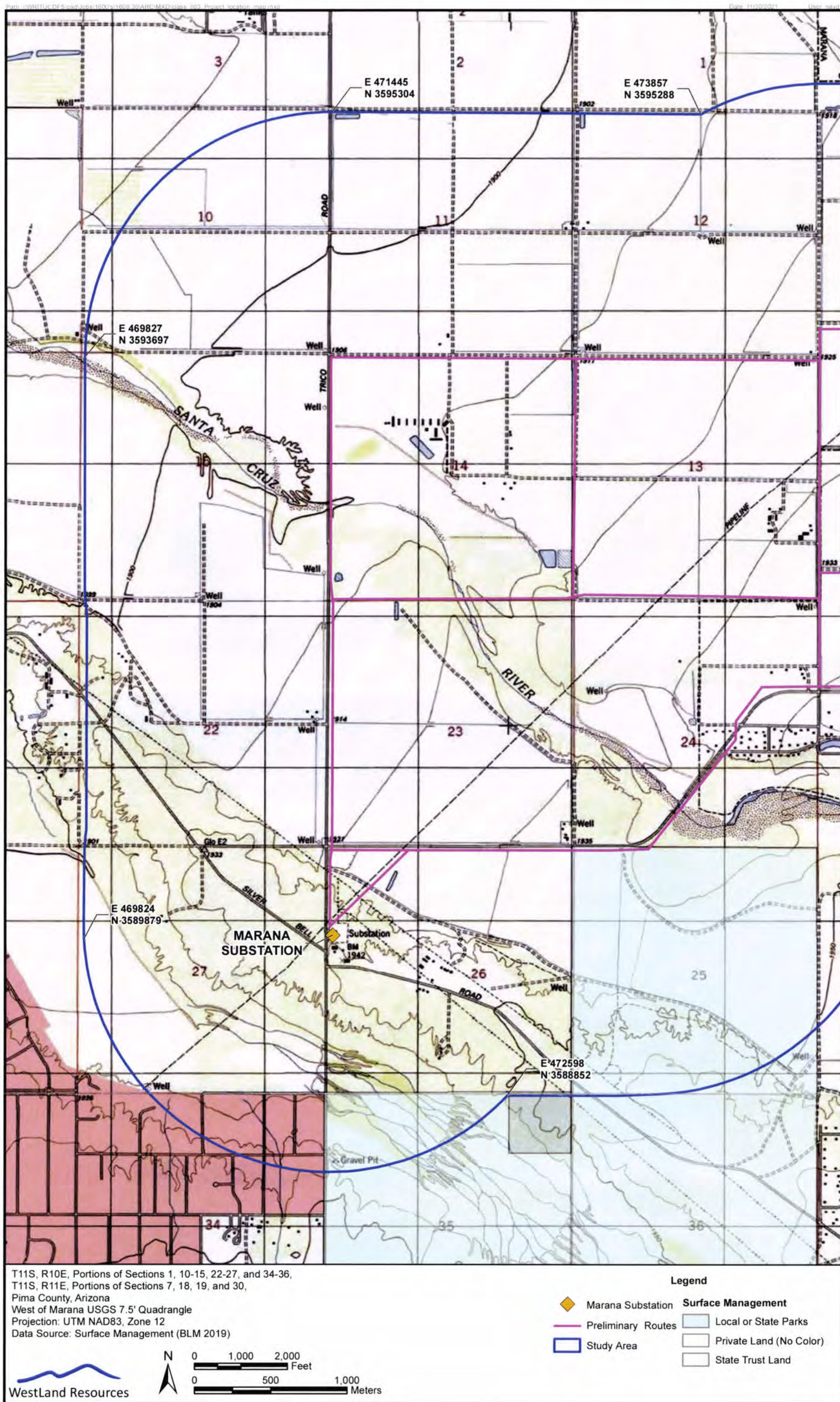


Figure 2.a. Study Area showing surface management

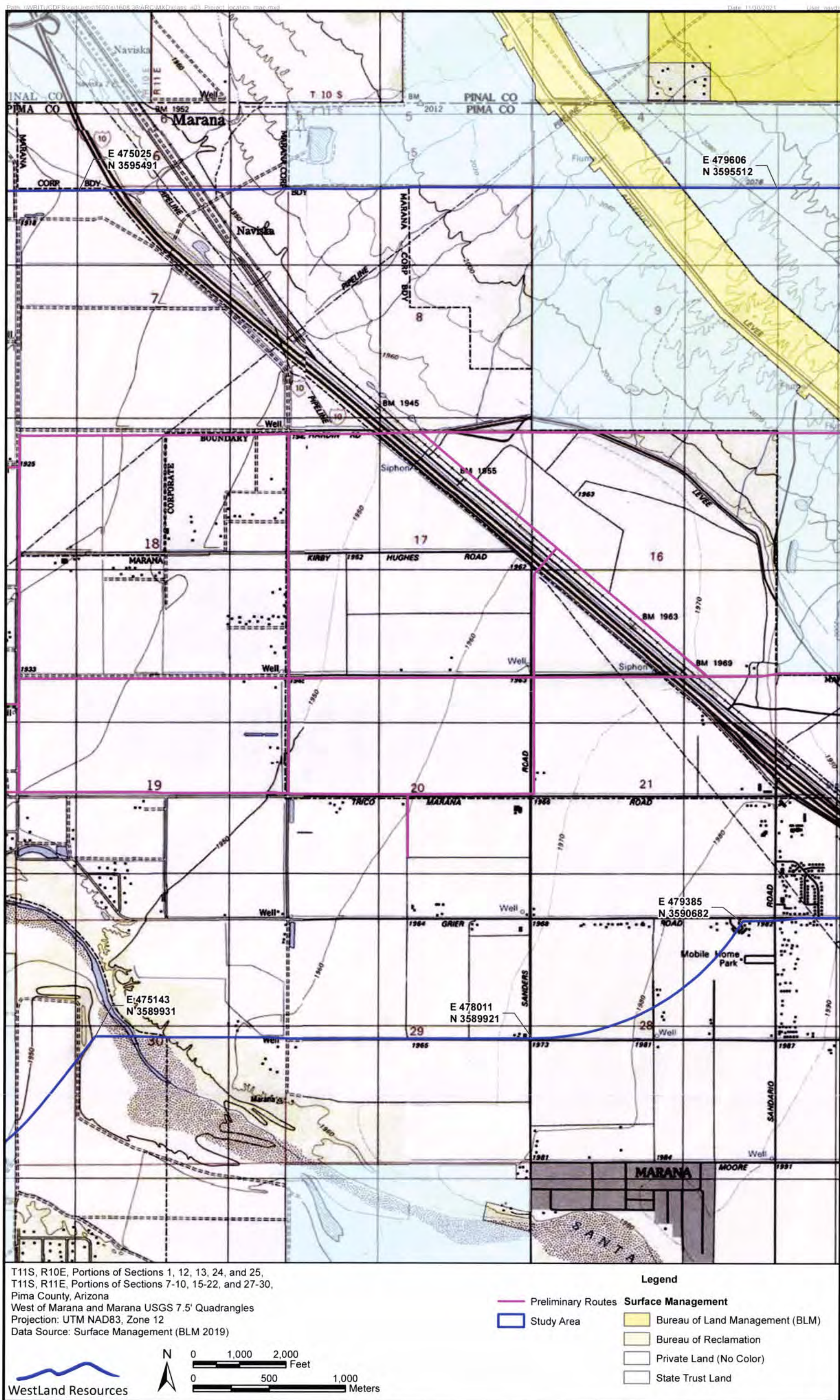


Figure 2.b. Study Area showing surface management

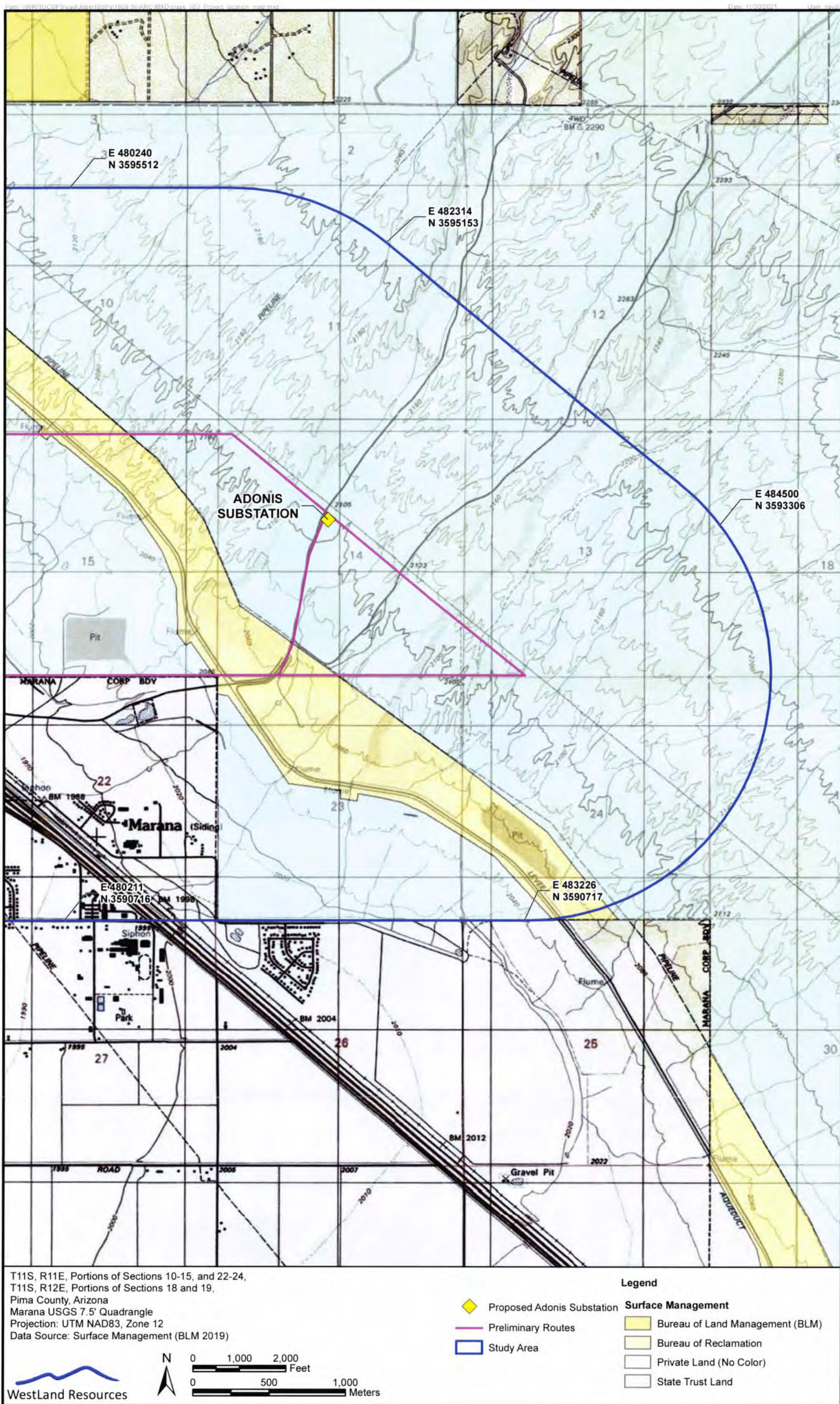


Figure 2.c. Study Area showing surface management

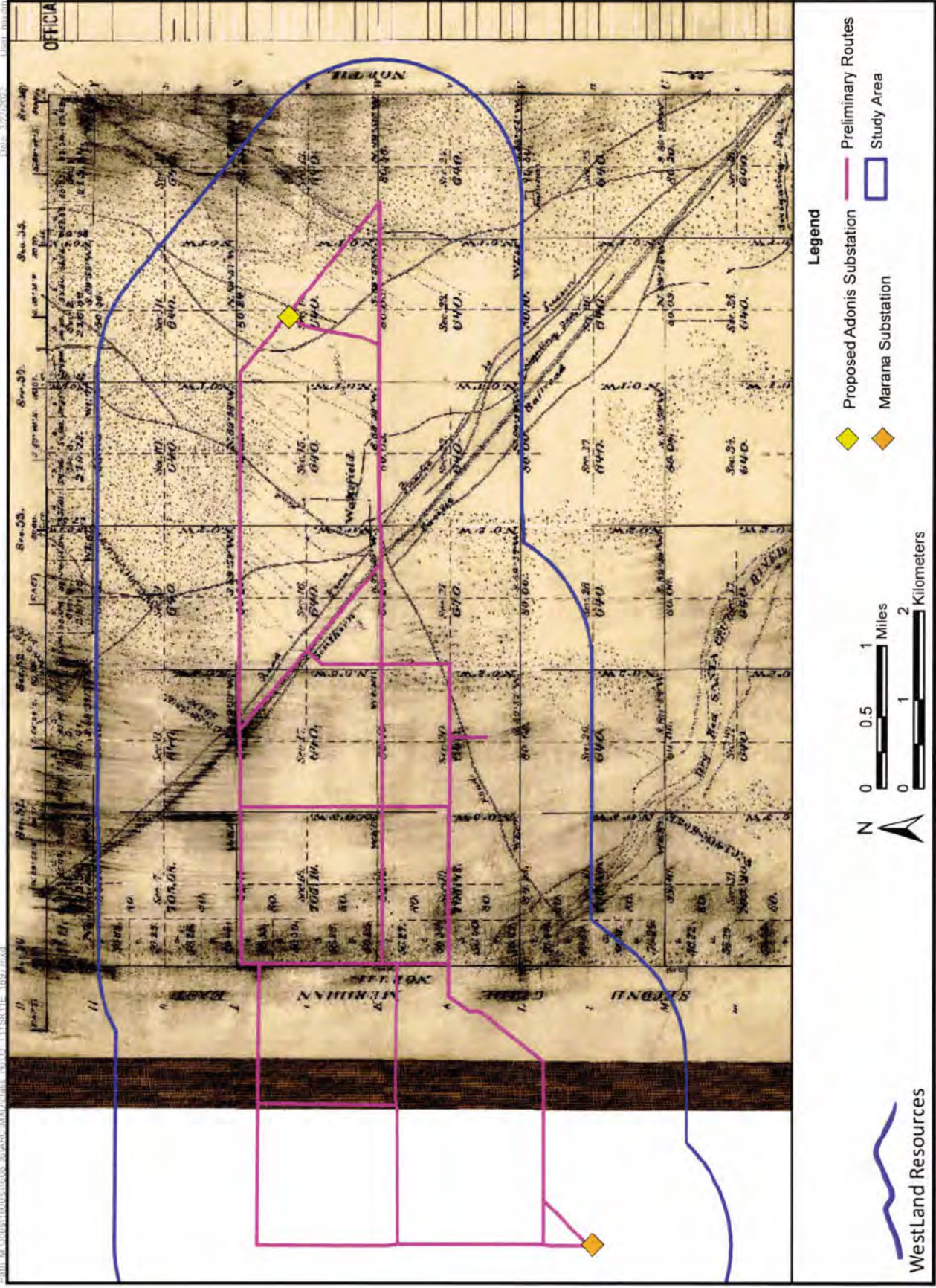


Figure 3. Overlay of the Study Area on the General Land Office plat of Township 11 South, Range 11 East, officially filed 1-8-1897

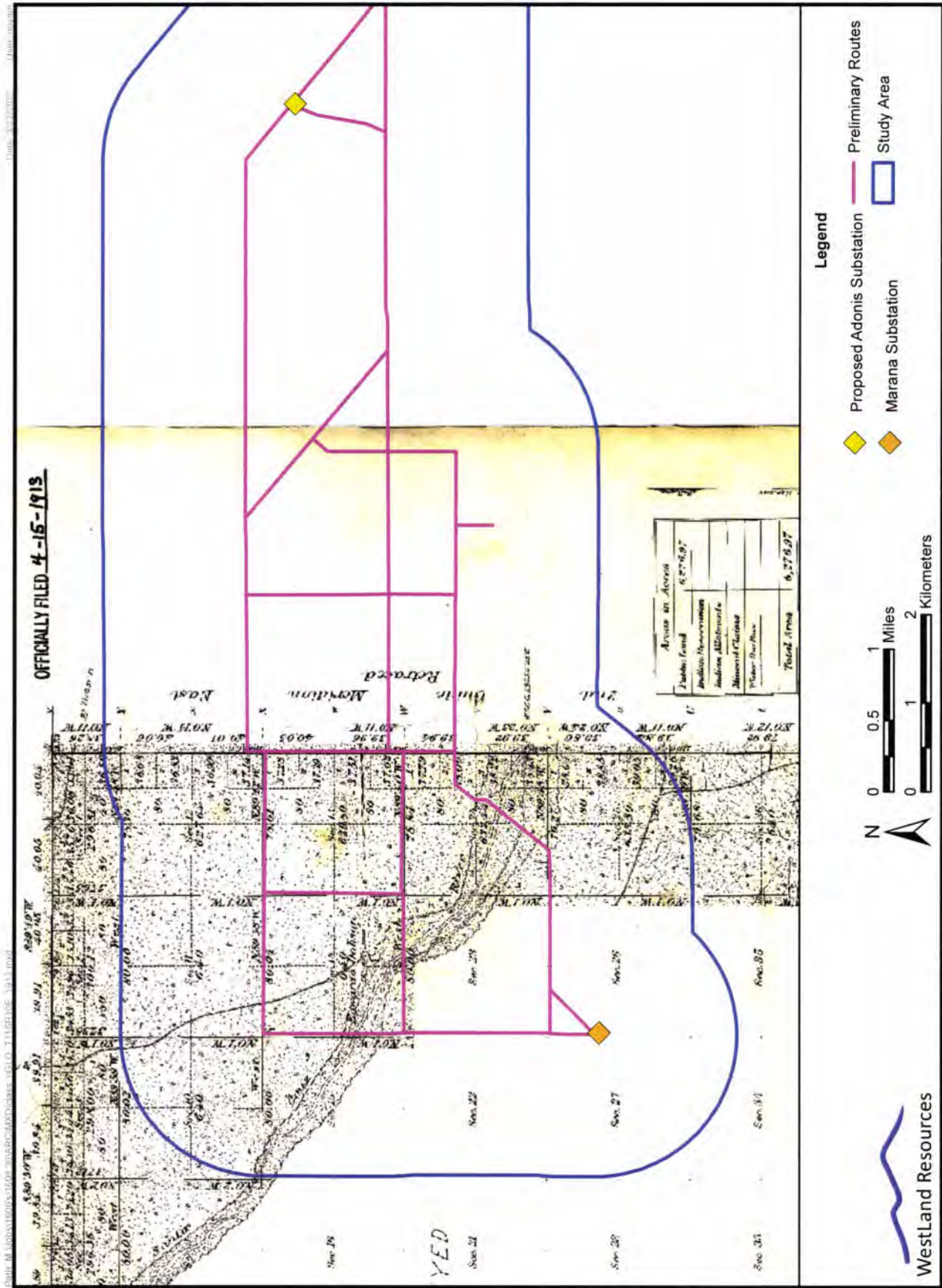
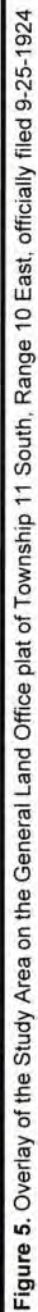
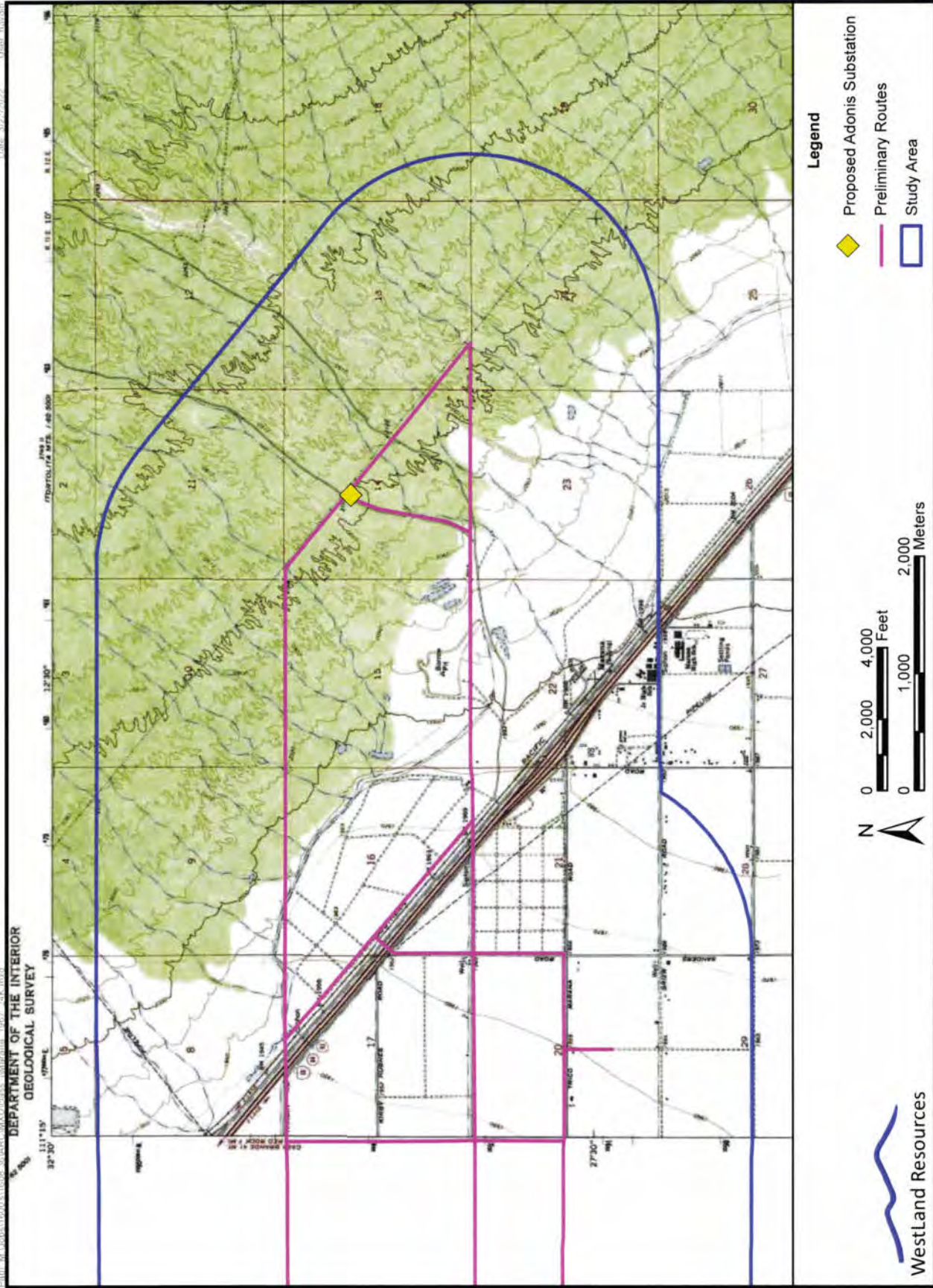


Figure 4. Overlay of the Study Area on the General Land Office plat of Township 11 South, Range 10 East, officially filed 4-15-1913





**Figure 6.** Overlay of the Study Area on the 1967 1:24,000 (7.5' series) Marana, Arizona USGS quadrangle

## APPENDIX A

### Archaeological Records Search

Figure A.2 depicts information that is considered sensitive and may be protected under federal, state, and local laws. As such, it has been redacted from this report.

**Table A.1. Previous archaeological surveys intersecting the Study Area**

Agency Project No.	Project Name	Reference
1955-3.ASM 1	Southern Pacific Pipeline Survey	McConville and Holzkamper (1955)
1979-39.ASM 2	TG&E Northern Tucson Transmission Line Survey	Rozen (1979)
1980-249.ASM 3	Tucson Aqueduct Phase A–CAP	McCarthy (1982)
1981-174.ASM 4	The Northern Tucson Basin Survey: Phase 1	Madsen et al. (1993)
1982-34.ASM 5	CAP Tucson Aqueduct Phase A Class III Survey	Czaplicki (1984)
1982-108.ASM 6	Marana Canning Co., Inc.	Urban (1982)
1982-160.ASM 7	Tucson Aqueduct Phase A	Czaplicki (1984)
1982-215.ASM 8	Tucson Aqueduct–Central Arizona Project	Lincoln 1982)
1983-198.ASM 9	Northern Tucson Basin Survey / Marana Phase II	Fish et al. (1992)
1984-31.ASM 10	Trico-Marana Survey	Castalia (1984)
1984-183.ASM 11	Tucson Aqueduct	Lincoln (1984)
1985-91.ASM 12	Bowie-Marana Surveys	Sires (1985a, 1985b)
1985-167.ASM 13	Western Area Power Administration's Saguaro to Tucson Reconductoring	Effland and Green (1985)
1987-222.ASM 14	U.S. Telecom Buried Fiber Optic Cable	O'Brien et al. (1987)
1988-86.ASM 15	Marana Substation Survey	Maldonado (1988)
1988-87.ASM 16	Tangerine Road Survey	Slawson (1988)
1989-165.ASM 17	Santa Cruz River Channelization	Doelle (1989)
1991-234.ASM 18	Trico Survey	Doak (1991)
1992-62.ASM 19	Rillito Loop	Adams (1992)
1992-250.ASM 20	Three Points to Marana Survey	Slaughter (1992)
1992-289.ASM 21	Red Rock Loop	Crary and Macnider (1992)
1994-420.ASM 22	Berry Aces Survey	Doak (1994a)
1994-425.ASM 23	Marana Survey	Doak (1994b)
1995-405.ASM 24	Lower Santa Cruz Survey	Antone and Rieder (1995)
1995-435.ASM 25	Marana Survey	Heuett (1995)
1997-414.ASM 26	Marana Dairy Tie Line Survey	Olson (1997)
1998-494.ASM 27	Marana Circuit Survey	Hesse (1998)
1999-204.ASM 28	Los Robles/Silverbell Road 1.25 Mile Cable Corridor (SVS #17)	Kaldahl (1999a)

**Table A.1. Previous archaeological surveys intersecting the Study Area**

Agency Project No.	Project Name	Reference
1999-206.ASM 29	Marana Wastewater Treatment Facility: Cultural Resources Assessment	Kaldahl (1999b)
1999-362.ASM 30	Phase I of the Tucson Freeway Management System	Hill and Garcia (1999)
1999-587.ASM 31	PBNS Level 3 Fiber Optic Line	Doak (1999)
2000-16.ASM 32	Marana/Honea Heights Colonia WWM Sewerline-Cultural Resources Assessment	Jones (2000)
2000-111.ASM 33	WS HYX-206 Marana Wastewater Treatment Facility 9.5-acre Expansion	Kaldahl (2000)
2000-253.ASM 34	Saguaro Power Plant Facilities Project	Punzmann (2000)
2000-565.ASM 35	Marana/Honea Heights Colonia WWM Sewerline	Jones (2001)
2000-571.ASM 36	Simpson Farms Survey–Tucson Audubon Society's North Simpson Farm Agricultural Restoration Project	Stevens (2001a)
2000-572.ASM 37	North Simpson Farms Survey	Stevens (2001b)
2000-621.ASM 38	Marana Cir. 15 & 16 Rebuild and Avra Valley Tie Line Project	Hesse and Archer (2000)
2000-723.ASM 39	AT&T NexGen/Core Project Link 3 Class 3 Survey	Kearns et al. (2001)
2000-822.ASM 40	Tucson Maintenance–I-10	Barnes and Wright (2001)
2001-128.ASM 41	TRICO ARCO Farms Overhead Power Line Conversion	Neves (2001)
2001-293.ASM 42	Silverbell and Trico Survey	Hayes and Klune (2001)
2001-295.ASM 43	River Road, Cloud Road, Mountain Shadows Road, and Trico-Marana Road Survey	Jones and Dart (2001)
2001-406.ASM 44	Survey of Six Proposed Reroutes for a Proposed Fiber Optic Cable ROW	Baker and Webb (2001)
2001-580.ASM 45	TEP Pole Replacement	Fuller (2001a)
2001-582.ASM 46	Qwest Marana	Fuller (2001b)
2003-43.ASM 47	Avra Valley Fire District Survey	Ruble (2002)
2003-456.ASM 48	18 Power Pole Replacement Localities	Knoblock and Hathaway (2002)
2003-517.ASM 49	Sagebrush Survey	Moses (2003b)
2003-544.ASM 50	Qwest Survey along Trico Road	Altschul (2002)
2003-910.ASM 51	Cultural Resources Survey of the 360Networks Fiber Optics Lines	Railey et al. (2001)
2003-948.ASM 52	TRICO Marana Estates Rebuild Project	Twilling (2003)
2003-1070.ASM 53	EPNG Tucson Class III Survey	Hesse and Gutierrez (2004)
2003-1137.ASM 54	Sandario Road Survey	Klucas (2003)
2003-1254.ASM 55	Marana Gardens II	Moses (2003a)
2003-1264.ASM 56	I-10 Geotech Monitoring	Terhune and Garcia (2007)

**Table A.1. Previous archaeological surveys intersecting the Study Area**

Agency Project No.	Project Name	Reference
2004-9.ASM 57	Marana Gardens	Doak (2003)
2004-331.ASM 58	East Line Expansion, Arizona Portion	William Self Associates (2005)
2004-626.ASM 59	Add. C: El Paso to Los Angeles Fiber Optic Cable Project: EPGN Ironwood and Farrell-Murphy Reroutes	Hesse (2001)
2004-666.ASM 60	East Marana Properties Environmental Services	Barr (2004)
2004-679.ASM 61	AT&T NexGen/Core Project	Baker (2004)
2004-1747.ASM 62	Marana Gin Property at NW Corner of Sandario & Trico Rds., 39.09 Acre Cultural Resources Survey(0304S#14)	McKee and Dart (2004)
2005-159.ASM 63	U of A Marana Farm	DeJongh and Dart (2005)
2005-180.ASM 64	Circuit 14 Survey	Doak (2005)
2005-509.ASM 65	Santa Cruz Farms	Ruble (2005)
2005-569.ASM 66	North Trico Rd. Electric Cable	Barr (2005)
2005-1056.ASM 67	Tortolita Mountain Ranch Enviro Services	Barr and Tucker (2006)
2005-1264.ASM 68	Sanders Road and Barnett Road Survey	Hopkins (2005)
2006-251.ASM 69	Marana Substation North	Levstik and Fahrni (2006)
2006-329.ASM 70	Arboles Verde Survey	Moore (2006)
2006-521.ASM 71	Picacho Quarry Access Road	Schilling (2006)
2006-625.ASM 72	Marana Substation Monitoring	Barr (2006a)
2006-681.ASM 73	Martin and Buckelew Farm Survey	Cook (2006, 2007)
2006-769.ASM 74	Trico Circuit 13 Rebuild	Barr (2006b)
2006-867.ASM 75	Trico Dove Mountain West Tie Line	Hesse and Levstik (2007)
2006-928.ASM 76	AT&T NexGen/Core Project	Freuden (2006)
2007-43.ASM 77	TRICO Arco Farms to Mule Deer Road Testing and Monitoring	Hesse (2008)
2007-77.ASM 78	Marana Substation Monitoring-Trico	Tucker (2006)
2007-85.ASM 79	Marana Place	Bild (2007)
2007-822.ASM 80	EPNG Line 2111 PIP	Hesse and Levstik (2008)
2008-355.ASM 81	EPNG Line 1007 FERC Reports & Baseline Studies	Hesse and Barr (2009); Hesse et al. (2009)
2008-621.ASM 82	Adonis Substation	Shelley (2009)
2008-757.ASM 83	Geologic Soil Investigations for the Proposed Northwest Reservoir, Tucson Reliability Division	Donaldson (2008)
2009-163.ASM 84	UP Estrella-Stockham CR Services	West and Ezzo (2007)

**Table A.1. Previous archaeological surveys intersecting the Study Area**

Agency Project No.	Project Name	Reference
2009-238.ASM 85	Trico Road Survey	Doak (2009)
2009-348.ASM 86	Trico Circuits 12 & 18 Rebuild	Barr (2009)
2009-461.ASM 87	Barnett Channel Survey	Lascaux and Howell (2009)
2009-497.ASM 88	Hardin Road Sewer Trunk Main Survey	Hesse (2007)
2009-787.ASM 89	San Lucas Floodwall ASLD	Jones (2009)
2009-827.ASM 90	Circuit 15 Rebuild	Barr (2010a)
2010-25.ASM 91	Dove Mountain West Tie-Line Archaeology	Barr (2010b)
2010-446.ASM 92	Trico Marana Survey	Doak (2010)
2010-519.ASM 93	Marana Domestic Water Improvement District System Upgrade	Dore and Buckles (2010)
2010-539.ASM 94	Marana to Sandario Tap Inventory	Buckles et al. (2009)
2011-299.ASM 95	Trico Double Circuit Rebuild	Rawson (2011)
2012-541.ASM 96	Tucson Aqueduct Reaches 3-5 Site Reassessment	Schilling (2013)
2013-311.ASM 97	Atlas 1438	Slawson (2013)
2013-466.ASM 98	Sandario Road Sidewalk	Hooper (2013)
2013-471.ASM 99	Saguaro to North Loop Transmission Line Project	CH2MHILL (2010)
2014-360.ASM 100	Veterans Memorial Cemetery Access Road	Buckles (2014)
2016-288.ASM 101	Santa Cruz Farms Monitoring	Diehl (2016)
2019-16.ASM 102	De Anza National Historic Trail at Oit Pars Trailhead	Hesse (2019)
2020-292.ASM 103	Adonis Road Class III	Stone (2020)
WRI 527.113 104	Adonis Sewer Literature Review	King (2018)
WRI 1814.01 105	Marana Veterans Cemetery Cultural Resources	King (2013)

Table A.2. Known archaeological sites intersecting the Study Area

Site Number (ASM)	Will Be Consolidated by ASM?	Site Type	Age and Cultural Affiliation	Reference	NRHP Eligibility
AZ Y:3:50 (South Gila Ditch) <sup>1</sup>	No	Features	Euroamerican/Middle to Late Historic (1800–1950)	Estes et al. (2005)	Recommended eligible (a)
AZ Z:2:40 (Southern Pacific Railroad Mainline–Southern Route) <sup>2</sup>	No	Artifact scatter with features	Euroamerican/Middle to Late Historic (1800–1950)	West and Ezzo (2007)	Recommended eligible (a)
AZ AA:2:118 (Historic SR 84) <sup>3</sup>	No	Historic road	Euroamerican/Late Historic (1900–1950)	Baker and Webb (2001); William Self Associates (2005); Barr and Tucker (2006); West and Ezzo (2007); Lascaux and Howell (2009); Maldonado (1988); Hesse (1998); Hesse and Archer (2000); Hesse (2001); Fuller (2001b); Barr (2004); Barr (2005); Ruble (2005); Moore (2006); Barr (2006a); Barr (2006b); Tucker (2006); Barr (2009); Buckles et al. (2009); Doak (2010); Rawson (2011); Diehl (2016)	Determined eligible (d)
AZ AA:11:12 (Hog Farm Ballcourt Site) <sup>4</sup>	No	Artifact scatter with features	<ul style="list-style-type: none"> <li>Hohokam/Colonial Period (750–950 A.D.) and Classic Period (1100–1450 A.D.)</li> <li>Euroamerican/Historic (1500–1950)</li> </ul>		Determined eligible (d) (SHPO-2006-1859)
AZ AA:11:31 <sup>5</sup>	No	Artifact scatter with feature	Native American/Ceramic (200–1500 A.D.)	Czaplicki and Mayberry (1983) Downum (1993)	Not evaluated
AZ AA:11:34 <sup>6</sup>	No	Artifact scatter	Hohokam/Early Ceramic period (200–1000 A.D.)	Czaplicki and Mayberry (1983)	Not evaluated
AZ AA:11:43 <sup>7</sup>	No	Artifact scatter	Hohokam/Ceramic period (200–1500 A.D.)	Czaplicki and Mayberry (1983); Downum (1993)	Not evaluated

Table A.2. Known archaeological sites intersecting the Study Area

Site Number (ASM)	Will Be Consolidated by ASM?	Site Type	Age and Cultural Affiliation	Reference	NRHP Eligibility
AZ AA:11:48 <sup>8</sup>	No	Artifact scatter	Native American/Ceramic (200–1500 A.D.)	Downum (1993)	Not evaluated
AZ AA:11:54 <sup>9</sup>	No	Artifact scatter	Hohokam/Ceramic period (200–1500 A.D.)	Downum (1993)	Not evaluated
AZ AA:11:55 <sup>10</sup>	No	Artifact scatter	Hohokam/Ceramic period (200–1500 A.D.)	Downum (1993)	Not evaluated
AZ AA:11:56 <sup>11</sup>	No	Artifact scatter	Hohokam/Ceramic period (200–1500 A.D.)	Downum (1993)	Not evaluated
AZ AA:11:61 <sup>12</sup>	No	Artifact scatter	Native American/Ceramic (200–1500 A.D.)	Downum (1993)	Not evaluated
AZ AA:11:62 <sup>13</sup>	No	Artifact scatter	Native American/Ceramic (200–1500 A.D.)	Downum (1993)	Not evaluated
AZ AA:11:63 <sup>14</sup>	No	Artifact scatter	Native American/Ceramic (200–1500 A.D.)	Downum (1993)	Not evaluated
AZ AA:11:64 <sup>15</sup>	No	Artifact scatter with feature	Native American/Ceramic (200–1500 A.D.)	Downum (1993)	Not evaluated
AZ AA:11:90 <sup>16</sup>	No	Artifact scatter	Hohokam/Ceramic period (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:11:93 <sup>17</sup>	No	Artifact scatter	Hohokam/Ceramic period (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:11:133 <sup>18</sup>	No	Artifact scatter	Hohokam/Ceramic period (200–1500 A.D.)	Stevens (2001a); Stevens (2001b)	Not evaluated (SHPO-2000-3216)
AZ AA:11:135 <sup>19</sup>	No	Artifact scatter	Hohokam/Ceramic period (200–1500 A.D.)	Hesse (2001); Moore (2006); Buckles et al. (2009)	Determined eligible (d) (SHPO-2006-1859)
AZ AA:11:136 <sup>20</sup>	No	Artifact scatter	Hohokam/Ceramic period (200–1500 A.D.)	Hesse (2001); Moore (2006)	Determined eligible (d) (SHPO-2006-1859)
AZ AA:11:139 <sup>21</sup>	No	Artifact scatter with features	<ul style="list-style-type: none"> <li>Hohokam/Ceramic period (200–1500 A.D.)</li> <li>Euroamerican/Historic (1500–1950)</li> </ul>	Barr (2004); Tucker (2007)	Recommended not eligible
AZ AA:11:204 <sup>22</sup>	No	Artifact scatter	Euroamerican/Historic (1500–1950)	Barr and Tucker (2006)	Determined not eligible (SHPO-2006-2293)
AZ AA:11:207 <sup>23</sup>	No	Artifact scatter	Euroamerican/Late Historic (1900–1950)	Levstik and Fahrni (2006)	Recommended not eligible
AZ AA:11:208 <sup>24</sup>	No	Artifact scatter with features	Euroamerican/Late Historic (1900–1950)	Levstik and Fahrni (2006)	Recommended eligible (a) and (d)

Table A.2. Known archaeological sites intersecting the Study Area

Site Number (ASM)	Will Be Consolidated by ASM?	Site Type	Age and Cultural Affiliation	Reference	NRHP Eligibility
AZ AA:11:221 <sup>25</sup>	No	Information not available	Information not available	Tucker (2007)	Information not available
AZ AA:11:222 <sup>26</sup>	No	Information not available	Information not available	Tucker (2007)	Information not available
AZ AA:11:223 <sup>27</sup>	No	Artifact scatter	Euroamerican/Historic (1500–1950)	Hesse (2007)	Recommended not eligible
AZ AA:11:237 <sup>28</sup>	No	Feature	Euroamerican/Late Historic (1900–1950)	Buckles et al. (2009); Dore and Buckles (2010)	Determined eligible (SHPO-2008-2010)
AZ AA:11:240 <sup>29</sup>	No	Feature	Euroamerican/Late Historic (1900–1950)	Buckles et al. (2009)	Recommended not eligible
AZ AA:11:246 <sup>30</sup>	No	Artifact scatter	Euroamerican/Late Historic (ca. 1950s–1960s)	King (2013)	Recommended not eligible
AZ AA:12:123 <sup>31</sup>	Yes; under AZ AA:12:123	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	McCarthy (1982)	Not evaluated
AZ AA:12:126 <sup>32</sup>	No	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	McCarthy (1982)	Not evaluated
AZ AA:12:251 <sup>33</sup>	Yes; under AZ AA:12:251	Artifact scatter with features	Hohokam/Middle to Late Ceramic (1100–1450 A.D.)	Tucker (2007)	Determined eligible (d) (SHPO 2007-09-14)
AZ AA:12:355 <sup>34</sup>	Yes; under AZ AA:12:368	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Donaldson (2008); Barr (2010b); Schilling (2013)	Not evaluated
AZ AA:12:356 <sup>35</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Lincoln (1984)	Recommended not eligible
AZ AA:12:357 <sup>36</sup>	No	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Donaldson (2008) Schilling (2013)	Not evaluated
AZ AA:12:358 <sup>37</sup>	Yes; under AZ AA:12:358	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992) Schilling (2013)	Determined eligible (d) (SHPO-2010-1469)
AZ AA:12:359 <sup>38</sup>	Yes; under AZ AA:12:365	Artifact scatter	Euroamerican/Historic (1500–1950)	Fuller (2001a) Hesse and Levstik (2007)	Not evaluated
AZ AA:12:360 <sup>39</sup>	Yes; under AZ AA:12:365	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Whitaker (2007) Fergusson (2010) Schilling (2013)	Not evaluated

Table A.2. Known archaeological sites intersecting the Study Area

Site Number (ASM)	Will Be Consolidated by ASM?	Site Type	Age and Cultural Affiliation	Reference	NRHP Eligibility
AZ AA:12:361 <sup>40</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Schilling (2013)	Recommended eligible (d)
AZ AA:12:362 <sup>41</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Schilling (2013)	Recommended eligible (d)
AZ AA:12:364 <sup>42</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Schilling (2013)	Recommended not eligible
AZ AA:12:365 <sup>43</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fuller (2001a) Whitaker (2007) Fergusson (2010) Schilling (2013)	Determined eligible (d) (SHPO-2010-0826)
AZ AA:12:366 <sup>44</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Schilling (2013)	Recommended not eligible
AZ AA:12:367 <sup>45</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Schilling (2013)	Not evaluated (SHPO-2008-0982)
AZ AA:12:368 <sup>46</sup>	Yes; under AZ AA:12:368	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Donaldson (2008) Schilling (2013)	Recommended not eligible
AZ AA:12:369 <sup>47</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Urban (1982)	Not evaluated
AZ AA:12:382 <sup>48</sup>	No	Artifact scatter with feature	<ul style="list-style-type: none"> <li>Archaic/Archaic (8000 B.C.–200 A.D.)</li> <li>Hohokam/Ceramic (200–1500 A.D.)</li> </ul>	Terhune and Garcia (2007); Buckles (2009); Howell (2010)	Not evaluated
AZ AA:12:460 <sup>49</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Fuller (2001a); Knoblock and Hathaway (2002); Fahrni (2003); Whitaker (2007); Fergusson (2010); Schilling (2013)	Determined eligible (d) (SHPO-2010-0826)
AZ AA:12:461; <sup>50</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Fuller (2001a); Whitaker (2007); Fergusson (2010); Schilling (2013)	Determined eligible (d) (SHPO-2010-0826)
AZ AA:12:462 <sup>51</sup>	Yes; under AZ AA:12:368	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Czaplicki (1984); Donaldson (2008); Schilling (2013)	Recommended not eligible

Table A.2. Known archaeological sites intersecting the Study Area

Site Number (ASM)	Will Be Consolidated by ASM?	Site Type	Age and Cultural Affiliation	Reference	NRHP Eligibility
AZ AA:12:463 52	Yes; under AZ AA:12:368	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Czaplicki (1984); Donaldson (2008); Schilling (2013)	Recommended not eligible
AZ AA:12:464 53	Yes; under AZ AA:12:368	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Czaplicki (1984); Donaldson (2008); Schilling (2013)	Recommended not eligible
AZ AA:12:466 54	Yes; under AZ AA:12:358	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Schilling (2013)	Not evaluated (SHPO-2008-0982)
AZ AA:12:469 55	No	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Fuller (2001a); Whitaker (2007); Donaldson (2008); Fergusson (2010)	Determined eligible (d) (SHPO-2010-1469)
AZ AA:12:470 56	Yes; under AZ AA:12:470	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Fuller (2001a); Hesse and Levstik (2007); Whitaker (2007); Donaldson (2008); Barr (2010b); Fergusson (2010)	Determined eligible (d) (SHPO-2010-1469)
AZ AA:12:471 57	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Fuller (2001a); Whitaker (2007); Fergusson (2010)	Determined not eligible (SHPO-2010-0826)
AZ AA:12:472 58	No	Artifact scatter with feature	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:473 59	No	Artifact scatter with feature	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:508 60	No	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Fuller (2001a); Whitaker (2007); Donaldson (2008); Fergusson (2010)	Determined not eligible (SHPO-2010-0826)
AZ AA:12:509 61	No	Artifact scatter with feature	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:510 62	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated

Table A.2. Known archaeological sites intersecting the Study Area

Site Number (ASM)	Will Be Consolidated by ASM?	Site Type	Age and Cultural Affiliation	Reference	NRHP Eligibility
AZ AA:12:511	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Fuller (2001a); Whitaker (2007); Donaldson (2008); Fergusson (2010)	Determined not eligible (SHPO-2010-0826)
AZ AA:12:512	Yes; under AZ AA:12:518	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:514	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:517	No	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Hesse and Levstik (2007); Donaldson (2008)	Determined eligible (d) (SHPO-2007-1999)
AZ AA:12:518	Yes; under AZ AA:12:518	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Hesse and Levstik (2007); Donaldson (2008)	Determined eligible (d) (SHPO-2007-1999)
AZ AA:12:519	No	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:520	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008); Schilling (2013)	Not evaluated
AZ AA:12:521	Yes; under AZ AA:12:470	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:522	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:523	No	Artifact scatter with feature	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:524	No	Artifact scatter	• Hohokam/Ceramic (200–1500 A.D.) • Euroamerican/Historic (1500–1950)	Fish et al. (1992)	Not evaluated
AZ AA:12:525	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:536	Yes; under AZ AA:12:358	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Fuller (2001a); Hesse and Levstik (2007); Whitaker (2007); Fergusson (2010); Schilling (2013)	Determined eligible (d) (SHPO-2010-0826)

Table A.2. Known archaeological sites intersecting the Study Area

Site Number (ASM)	Will Be Consolidated by ASM?	Site Type	Age and Cultural Affiliation	Reference	NRHP Eligibility
AZ AA:12:537 <sup>76</sup>	Yes; under AZ AA:12:358	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:538 <sup>77</sup>	Yes; under AZ AA:12:358	Features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:539 <sup>78</sup>	No	Artifact scatter with feature	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:540 <sup>79</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:541 <sup>80</sup>	Yes; under AZ AA:12:470	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:542 <sup>81</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:543 <sup>82</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:544 <sup>83</sup>	Yes; under AZ AA:12:358	Features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:545 <sup>84</sup>	Yes; under AZ AA:12:358	Features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:546 <sup>85</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:547 <sup>86</sup>	Yes; under AZ AA:12:470	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:548 <sup>87</sup>	No	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:549 <sup>88</sup>	No	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:550 <sup>89</sup>	Yes; under AZ AA:12:358	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:551; <sup>90</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Neves (2001); Hesse (2008)	Not evaluated
AZ AA:12:552 <sup>91</sup>	No	Artifact scatter with feature	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:553 <sup>92</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated

Table A.2. Known archaeological sites intersecting the Study Area

Site Number (ASM)	Will Be Consolidated by ASM?	Site Type	Age and Cultural Affiliation	Reference	NRHP Eligibility
AZ AA:12:554 <sup>93</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:557; <sup>94</sup>	Yes; under AZ AA:12:365	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Neves (2001); Hesse (2008)	Not evaluated
AZ AA:12:558; <sup>95</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:559 <sup>96</sup>	Yes; under AZ AA:12:358	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:560; <sup>97</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:561 <sup>98</sup>	Yes; under AZ AA:12:358	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated (SHPO-2008-0982)
AZ AA:12:562 <sup>99</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:563 <sup>100</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Neves (2001); Hesse (2008)	Not evaluated
AZ AA:12:564 <sup>101</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992) Schilling (2013);	Recommended eligible (d)
AZ AA:12:565 <sup>102</sup>	No	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:566 <sup>103</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:567 <sup>104</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Neves (2001); Hesse (2008)	Not evaluated
AZ AA:12:568 <sup>105</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Neves (2001); Hesse (2008)	Not evaluated
AZ AA:12:569 <sup>106</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:570 <sup>107</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:571 <sup>108</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated

Table A.2. Known archaeological sites intersecting the Study Area

Site Number (ASM)	Will Be Consolidated by ASM?	Site Type	Age and Cultural Affiliation	Reference	NRHP Eligibility
AZ AA:12:573 <sup>109</sup>	No	Features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:574 <sup>110</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:575 <sup>111</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Fuller (2001a); Fahrni (2003); Hesse and Levstik (2007); Whitaker (2007); Fergusson (2010)	Determined not eligible (d) (SHPO-2010-0826)
AZ AA:12:576 <sup>112</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Neves (2001); Hesse (2008); Schilling (2013)	Recommended eligible (d)
AZ AA:12:577 <sup>113</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Schilling (2013)	Recommended eligible (d)
AZ AA:12:578 <sup>114</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:579 <sup>115</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Schilling (2013)	Not evaluated
AZ AA:12:580 <sup>116</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:582 <sup>117</sup>	No	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:584 <sup>118</sup>	No	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:585 <sup>119</sup>	Yes; under AZ AA:12:365	Features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:586 <sup>120</sup>	No	Features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:587 <sup>121</sup>	No	Features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:589 <sup>122</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:590 <sup>123</sup>	Yes; under AZ AA:12:365	Features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated

Table A.2. Known archaeological sites intersecting the Study Area

Site Number (ASM)	Will Be Consolidated by ASM?	Site Type	Age and Cultural Affiliation	Reference	NRHP Eligibility
AZ AA:12:591 <sup>124</sup>	Yes; under AZ AA:12:123	Artifact scatter with feature	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:592 <sup>125</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:593 <sup>126</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:594 <sup>127</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:595 <sup>128</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Hesse and Levstik (2007); Donaldson (2008); Barr (2010b)	Determined eligible (d) (SHPO-2010-1469)
AZ AA:12:596 <sup>129</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:597 <sup>130</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:598 <sup>131</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:601 <sup>132</sup>	Yes; under AZ AA:12:365	Features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:602 <sup>133</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Whitaker (2007)	Not evaluated
AZ AA:12:623 <sup>134</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:624 <sup>135</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Schilling (2013)	Not evaluated
AZ AA:12:625 <sup>136</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:626 <sup>137</sup>	Yes; under AZ AA:12:365	Features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:627 <sup>138</sup>	No	Features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:628 <sup>139</sup>	No	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:629 <sup>140</sup>	Yes; under AZ AA:12:365	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated

Table A.2. Known archaeological sites intersecting the Study Area

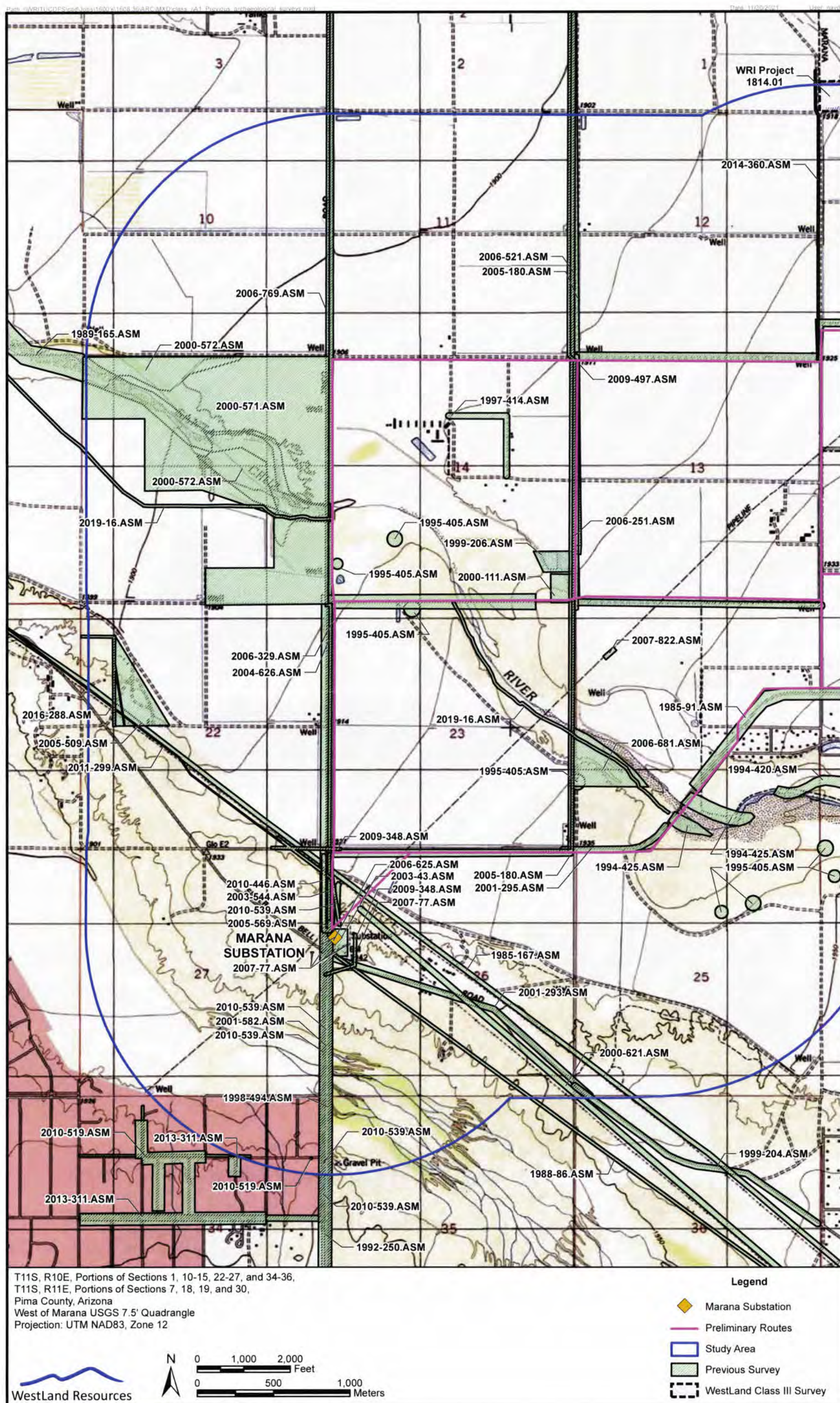
Site Number (ASM)	Will Be Consolidated by ASM?	Site Type	Age and Cultural Affiliation	Reference	NRHP Eligibility
AZ AA:12:630 <sup>141</sup>	Yes; under AZ AA:12:251	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:631 <sup>142</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:632 <sup>143</sup>	Yes; under AZ AA:12:251	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:633 <sup>144</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:634 <sup>145</sup>	No	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:635 <sup>146</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:636 <sup>147</sup>	No	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated (SHPO-2008-0982)
AZ AA:12:637 <sup>148</sup>	No	Artifact scatter with feature	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:638 <sup>149</sup>	No	Artifact scatter with feature	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:639 <sup>150</sup>	No	Artifact scatter with feature	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:640 <sup>151</sup>	No	Artifact scatter with feature	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:642 <sup>152</sup>	No	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:643 <sup>153</sup>	No	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008)	Not evaluated
AZ AA:12:644 <sup>154</sup>	No	Artifact scatter with feature	<ul style="list-style-type: none"> <li>Hohokam/Ceramic (200–1500 A.D.)</li> <li>Unknown/unknown</li> </ul>	Fish et al. (1992); Donaldson (2008); Schilling (2013)	Not evaluated
AZ AA:12:645 <sup>155</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Donaldson (2008); Schilling (2013)	Not evaluated
AZ AA:12:646 <sup>156</sup>	Yes; under AZ AA:12:646	Artifact scatter with features	Hohokam/Ceramic, Tanque Verde phase (1100–1450 A.D.)	Fish et al. (1992); Jones (2009)	Determined eligible (d) (SHPO-2010-1680)
AZ AA:12:647 <sup>157</sup>	No	Artifact scatter with feature	<ul style="list-style-type: none"> <li>Hohokam/Ceramic (200–1500 A.D.)</li> <li>Unknown/Unknown</li> </ul>	Fish et al. (1992)	Not evaluated

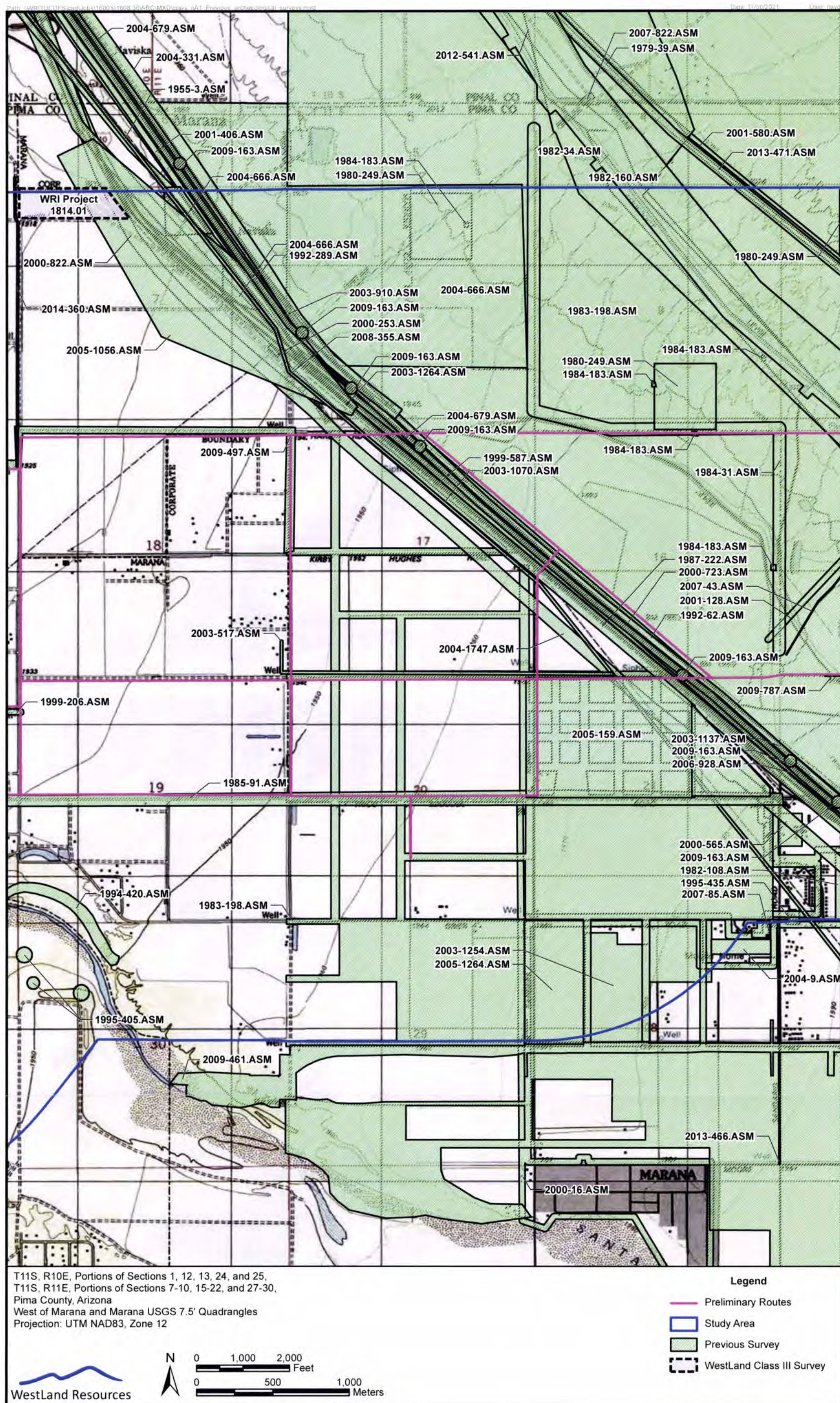
Table A.2. Known archaeological sites intersecting the Study Area

Site Number (ASM)	Will Be Consolidated by ASM?	Site Type	Age and Cultural Affiliation	Reference	NRHP Eligibility
AZ AA:12:648 <sup>158</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:649 <sup>159</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:668 <sup>160</sup>	Yes; under AZ AA:12:646	Feature	Native American/Late Ceramic (1300–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:669 <sup>161</sup>	Yes; under AZ AA:12:646	Artifact scatter with feature	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:682 <sup>162</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Tucker (2007)	Not evaluated
AZ AA:12:683 <sup>163</sup>	Yes; under AZ AA:12:683	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992); Tucker (2007); Fish et al. (1992); Adams 1992; Klucas (2002); Twilling (2003); Doak (2009); Jones (2009)	Determined eligible (d) (SHPO 2007-1466)
AZ AA:12:685 <sup>164</sup>	No	Artifact scatter with feature	Hohokam/Ceramic (200–1500 A.D.)	Adams 1992; Klucas (2002)	Recommended not eligible
AZ AA:12:687 <sup>165</sup>	Yes; under AZ AA:12:646	Artifact scatter with feature	Hohokam/Ceramic (200–1500 A.D.)	Fish et al. (1992)	Not evaluated
AZ AA:12:740 <sup>166</sup>	No	Artifact scatter	Hohokam/Ceramic (200–1500 A.D.)	Doak (1991)	Not evaluated
AZ AA:12:741 <sup>167</sup>	No	Artifact scatter with feature	Hohokam/Middle Ceramic (1000–1300 A.D.)	Adams 1992; Baker and Webb (2001); Barnes and Wright (2001); Kearns et al. (2001); Railey et al. (2001); Terhune and Garcia (2007); Jones (2008)	Determined eligible (d) (SHPO-2007-1466)
AZ AA:12:742 <sup>168</sup>	No	Artifact scatter with features	Euroamerican/Historic (1500–1950)	Kearns et al. (2001); Railey et al. (2001); Freuden (2006); Terhune and Garcia (2007)	Determined not eligible (SHPO-2007-1466)
AZ AA:12:831 <sup>169</sup>	No	Artifact scatter	Hohokam/Middle Ceramic (1000–1300 A.D.)	Deaver (1998)	Not evaluated
AZ AA:12:857 <sup>170</sup>	No	Artifact scatter	<ul style="list-style-type: none"> <li>Native American/Prehistoric (1200 B.C.–1500 A.D.)</li> <li>Euroamerican/Historic (1500–1950)</li> </ul>	Doak (1999)	Not evaluated (SHPO 12/28/2000)

Table A.2. Known archaeological sites intersecting the Study Area

Site Number (ASM)	Will Be Consolidated by ASM?	Site Type	Age and Cultural Affiliation	Reference	NRHP Eligibility
AZ AA:12:870 (Cortaro Farms Canal) 171	No	Features	Euroamerican/Historic (1900–1950)	Barnes and Wright (2001); McKee and Dart (2004); Marshall et al. (2008); Lascaux and Howell (2009); King (2013)	Determined eligible (d) (SHPO-2008-1094)
AZ AA:12:872 172	No	Artifact scatter	Hohokam/Prehistoric (12000 B.C.–1500 A.D.)	Railey et al. (2001)	Determined eligible (d) (SHPO-2007-1466)
AZ AA:12:875 173	No	Features	Euroamerican/Historic (1500–1950)	Jones et al. (2001)	Determined eligible (c) and (d) (SHPO 2/4/2004)
AZ AA:12:876 174	No	Features	Euroamerican/Late Historic (1900–1950)	Jones (2001); Aragon (2013)	Recommended eligible (c) and (d)
AZ AA:12:877 175	No	Features	Native American/Preceramic (12000–500 B.C.)	Terhune and Garcia (2007)	Determined eligible (d) (SHPO-2003-1255)
AZ AA:12:896 176	Yes, under AZ AA:12:683	Artifact scatter	• Hohokam/Prehistoric (12000 B.C.–1500 A.D.) • Euroamerican/Historic (1500–1950)	Baker and Webb (2001)	Determined eligible (d) (SHPO-2007-1466)
AZ AA:12:897 177	No	Features	Euroamerican/Late Historic (1900–1950)	Baker and Webb (2001)	Determined eligible (a) and (c) (SHPO-2003-1255)
AZ AA:12:898 178	No	Artifact scatter	Hohokam/Prehistoric (12000 B.C.–1500 A.D.)	Baker and Webb (2001)	Determined eligible (d) (SHPO-2007-1466)
AZ AA:12:962 179	No	Artifact scatter	Hohokam/Classic (1100–1450 A.D.)	Barr (2004); Tucker (2007)	Recommended eligible (d)
AZ AA:12:963 180	No	Artifact scatter with features	Euroamerican/Historic (1500–1950)	Barr (2004); Tucker (2007)	Recommended not eligible
AZ AA:12:964 181	No	Artifact scatter	• Archaic/Middle Archaic (4800–1500 B.C.) • Hohokam/Ceramic (200–1500 A.D.)	Barr (2004); Tucker (2007)	Recommended not eligible
AZ AA:12:970 182	No	Features	Euroamerican/Modern (1950–present)	McKee and Dart (2004)	Not evaluated
AZ AA:12:971 183	No	Artifact scatter with features	Euroamerican/Modern (1950–present)	McKee and Dart (2004)	Recommended not eligible
AZ AA:12:1065 184	No	Artifact scatter with features	Hohokam/Ceramic (200–1500 A.D.)	Shelley (2009)	Determined not eligible (SHPO-2011-0649)
AZ AA:12:1071 185	No	Artifact scatter	Native American/Prehistoric (12,000 B.C.–1500 A.D.)	Shelley (2009); Fergusson (2010)	Determined eligible (d) (SHPO-2010-0826)





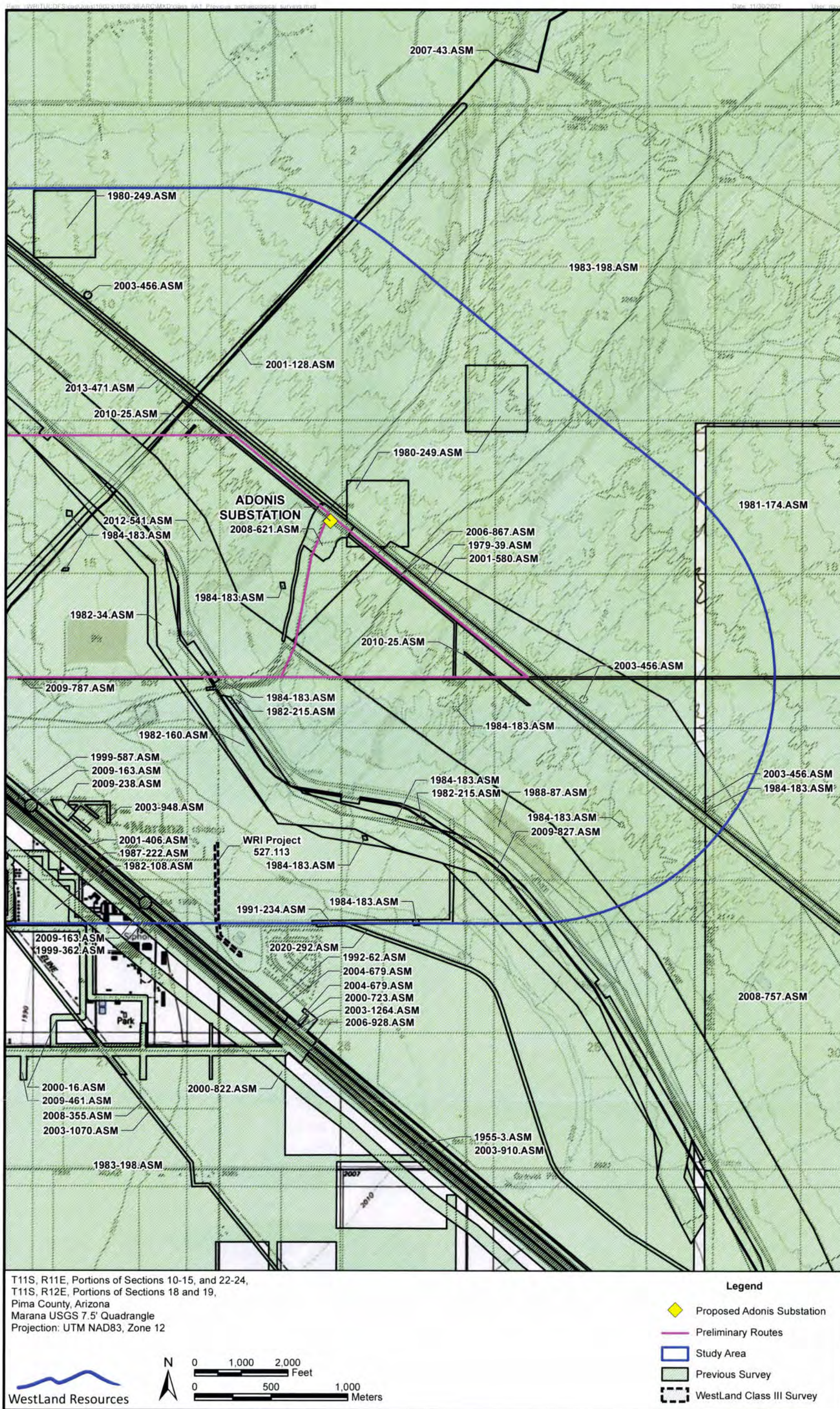


Figure A.1.c. Previous archaeological surveys intersecting the Study Area

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## EXHIBIT C – BIOLOGICAL WEALTH SPECIAL STATUS SPECIES AND SPECIES OF CONCERN

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As stated in the Arizona Administrative Code R14-3-219, Exhibit 1:

*Exhibit C:*

*Describe any areas in the vicinity of the proposed site or route which are unique because of biological wealth or because they are habitats for rare and endangered species. Describe the biological wealth or species involved and state the effects, if any, the proposed facilities will have thereon.*

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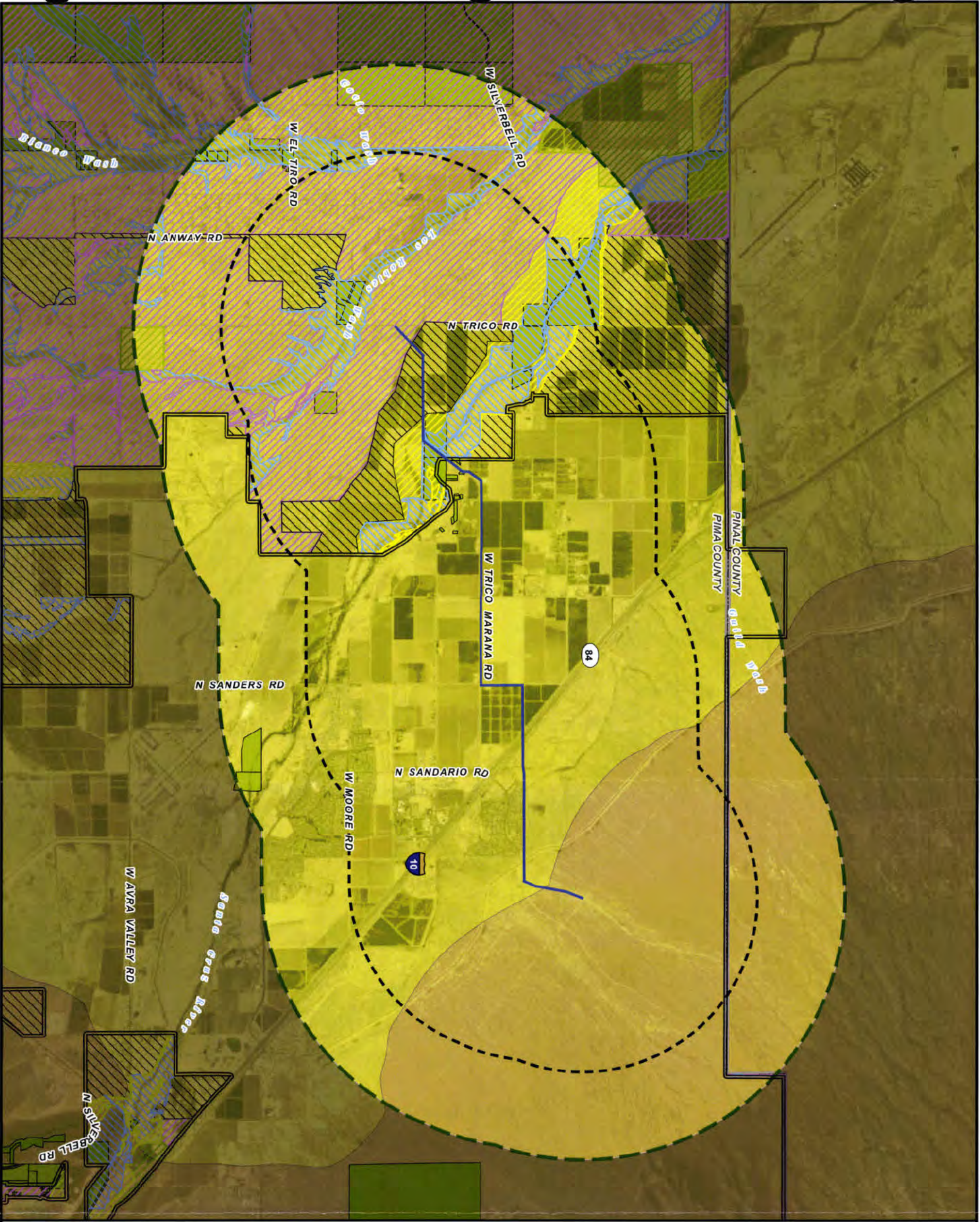
### OVERVIEW

Exhibit C addresses species protected by federal or state laws and policies because of their conservation status. Exhibit C also addresses whether any areas protected for conservation purposes (i.e., areas of biological wealth) are present in or near the vicinity of the Project. The Study Area is generally defined as all areas within a two-mile buffer of the Proposed Route identified in this application (**Exhibit C-1 – Biological Resources**). The Proposed Route is where all ground disturbance associated with the Project would occur. Exhibit C addresses the complete results of database queries and discusses whether identified species or protected areas may be present or affected by the Project.

### FEDERAL OR STATE LAWS AND POLICIES

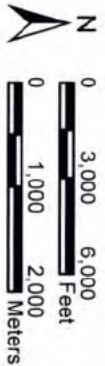
Laws and policies protecting rare species on private lands in Arizona include the following:

- The U.S. Fish and Wildlife Service (USFWS) administers the Endangered Species Act (ESA) of 1973, as amended. The ESA protects species listed as threatened or endangered from “take” (generally, directly, or indirectly harming or disturbing listed species and/or their habitat). Prior to being listed as threatened or endangered, a proposed listing rule is issued. When agency priorities take precedence over certain listing actions, species may also be designated as candidates, to be evaluated and potentially listed when no longer precluded by higher-priority actions. The ESA also allows for the designation of critical habitat (areas essential to the survival and recovery of listed species), although designation of critical habitat is not always required when a species is listed. Critical habitat is an administrative designation of a defined area with specific characteristics important to the survival and recovery of a listed species. Designation of critical habitat can affect federal actions, but not state or private actions that do not have a federal nexus.
- The Arizona Game and Fish Department (AGFD) manages and conserves wildlife in Arizona. Nearly all take of wildlife is regulated in some manner through the hunting and fishing license system. Arizona does not have a counterpart to the federal ESA, but a list of rare species (Wildlife Species of Concern) was created in 1996 without creating any specific statutory protections for those species. However, hunting regulations are used to provide some protection, and no hunting or capture of Wildlife Species of Concern is currently allowed.



T11S, R10E, Portions of Sections 24-26,  
T11S, R11E, Portions of Sections 14-16 and 19-21,  
Pima County, Arizona,  
Projection: NAD 1983 UTM Zone 12N  
Data Source: AEP  
Brown and Lowe's Biotic Communities of the Southwest (1980),  
developed by The Nature Conservancy in Arizona (2004).  
Preserves: Pima County, Protected Lands of Pima County  
Image Source: ArcGIS Online, World Topographic Map

- Legend**
- Proposed Route
  - Study Area
  - Arizona Game and Fish HDMS Area
  - Marana Town Limits
  - Preserve
  - Conservation Lands System (in Unincorporated Pima County)
  - Agriculture Inholdings within Conservation Lands System
  - Areas Outside Conservation Lands System
  - Biological Core Management Area
  - Important Riparian Area
  - Multiple Use Management Area
  - Biotic Community
    - Lower Colorado River Subdivision - Sonoran Desertscrub
    - Arizona Upland Subdivision - Sonoran Desertscrub



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**ARIZONA ELECTRIC POWER COOPERATIVE**  
Saguaro to Marana 115kV Line  
BIOLOGICAL RESOURCES  
Exhibit C-1

- The Arizona State Wildlife Action Plan (SWAP) provides strategies and conservation actions for managing Arizona's fish, wildlife, and wildlife habitats that are in greatest need of conservation. The current SWAP was updated in 2012 for a 10-year period as funded through a state-federal partnership and grant program (AGFD 2012a). The SWAP identifies several tiers of Species of Greatest Conservation Need (SGCN) based on vulnerability criteria that are ranked, with "1" indicating most vulnerable for that criterion (Vulnerable). Tier 1A includes Vulnerable species that are ESA-listed or candidate species, covered by conservation agreements, recently removed from the ESA list but still require post-delisting monitoring, or that have no open hunting season (closed-season species). Tier 1B includes Vulnerable species that do not meet Tier 1A criteria. Tier 1C includes species with substantial data gaps and unknown conservation status, but conservation concern may be warranted. Other tiers include species that are common, widespread, or are in stable populations. Exhibit C addresses Tier 1A and 1B SGCNs. Exhibit C does not address Tier 1C SGCNs, because the lack of conservation information does not necessarily indicate that those species meet the definition of "rare or endangered species" included in the statute. All SGCNs except Tiers 1A and 1B are addressed collectively with other wildlife in Exhibit D. A new SWAP, renamed Arizona Wildlife Conservation Strategy, will be completed in 2022 with an updated SGCN list.
- Native plants in Arizona are managed by the Arizona Department of Agriculture (AZDA), which regulates harvest and salvage. Harvest or salvage of most plant species may be permitted or required. Plants listed as Highly Safeguarded may only be taken or salvaged for scientific or conservation purposes and include plants that may become jeopardized or are in danger of extinction throughout all or a significant portion of their ranges and includes plants resident to the state and listed as endangered, threatened, or category 1 in the ESA. A field survey prior to construction would confirm the presence of any Highly Safeguarded plant species, or any other rare plant species present along the Proposed Route, although none are expected along the Proposed Route. On lands leased for the Project that are managed by the Arizona State Land Department (ASLD), which includes lands on the Tortolita Mountains alluvial fan east of I-10, a native plant inventory will be required and the ASLD will be compensated for protected native plants that are disturbed.

No other federal or state agency has jurisdiction over sensitive biological resources along the Proposed Route.

## INVENTORY METHODS

On March 14, 2022, WestLand Resources, Inc. (WestLand) requested an automated database query report of the AGFD Heritage Data Management System (HDMS) using the Arizona Environmental Online Review Tool Report (**Attachment C-1**). The HDMS query returned special-status species, special areas, SGCNs, and species of economic and recreation importance that may be present within three miles of the Proposed Route, so the query includes an additional mile outside the Study Area. Therefore, the AGFD database query may result in the inclusion of habitat types and species that are not present where direct impacts from the Project will occur. However, **Table C-1** (below) addresses the full results of the query. The USFWS maintains an online database, the Information for Planning and Conservation (IPaC), that

generates ESA-listed species and their critical habitat that may be present in an area subject to a query. The IPaC query results for the Study Area are attached to this exhibit (**Attachment C-2**).

Environmental conditions were recorded within the Study Area during site reconnaissance on December 15, 2021. On the Tortolita Mountains alluvial fan at the east end of the Proposed Route, native desert vegetation community is still largely intact, but the route from the eastern terminus of the line follows an existing road until it passes the Central Arizona Project (CAP) Canal and reaches a subdivision and other previously disturbed lands east of I-10. From I-10 to the western end of the Proposed Route, the route passes mainly through agricultural lands along existing roads. The only exceptions are at the Santa Cruz River, where there is an existing road crossing approximately 3,600 feet of floodplain with up to 700 feet of riparian area associated with the river channel, and the westernmost approximately 2,000 feet of the line, where the Proposed Route crosses 1,000 feet each of roadless agricultural field and native desert before tying into the existing Marana Substation. Therefore, except for the minimal surface disturbance for transmission structure construction and pulling stations, construction will generally involve little new surface disturbance and vegetation removal.

### **Special Areas**

The HDMS database query reported four special areas that intersect with the Study Area, three of them overlapping along the Santa Cruz River (Exhibit C-1 – Biological Resources):

- **Wildlife Connectivity: Coyote – Ironwood - Tucson Linkage Design.** This area includes the Santa Cruz River corridor within the Study Area. The Pima County Wildlife Connectivity Assessment (AGFD 2012b) was funded and supported by the Regional Transportation Authority of Pima County. The purpose of the study was to identify the general locations of wildlife linkages important to wildlife movement in Pima County. These are areas considered particularly important to conserve and would benefit from a more detailed conservation plan that addresses wildlife permeability issues. Specific recommendations are included in these reports for activities that would increase the permeability of the linkage design areas for wildlife movement.
- **Pima County Wildlife Movement Area – Riparian Wash:** the Santa Cruz River. This is the same corridor as the Wildlife Connectivity corridor within the Study Area.
- **Riparian Area:** This is another identification of the same Santa Cruz River corridor within the Study Area.
- **Pima County Wildlife Crossing Area** exists within the Study Area: CAP Canal. CAP Canal wildlife crossings are also identified in the Wildlife Connectivity report as important for wildlife movement, although the specific CAP Canal crossing that is within the Study Area is not within a Wildlife Connectivity area (AGFD 2012b).

In addition, there are other Pima County special designation areas not specifically mentioned in the HDMS query:

- Several parcels crossed by the Proposed Route at and near the Santa Cruz River that are identified as Conservation Lands owned by Pima County Regional Flood Control District (PCRFD) (Exhibit C-1 – Biological Resources). Those parcels were acquired as part of the Floodprone Land Acquisition Program (FLAP).

- The portions of the Study Area at the west end that are in unincorporated Pima County are subject to the Maeveen Marie Behan Conservation Lands System (CLS), land designations developed out of the Sonoran Desert Conservation Plan (SDCP). CLS land use restrictions apply only to Pima County discretionary actions. The Town of Marana boundary approximately follows the east bank of the Santa Cruz River, with unincorporated Pima County to the west (Exhibit C-1 – Biological Resources). CLS designations that the Proposed Routes crosses include:
  - Important Riparian Areas (IRA): 95% open space set aside, designated for their high water availability, vegetation density, and biological productivity, includes most of the lands at the crossing, overlapping with FLAP parcels identified above.
  - Biological Core: 80% open space set aside, designated for their potential to support high value habitat for five or more priority vulnerable species identified under the SDCP, includes the western edge of the Santa Cruz River floodplain and narrow strips of land in the river channel and along Marana Road through the IRA, also with some overlap of FLAP parcels.
  - Multiple Use Management Areas: 66.67% open space set aside with a potential to support high value habitat for three to four priority vulnerable species identified under the SDCP, includes the western approximately 1,000 feet of the Proposed Route as it crosses the creosotebush-dominated native vegetation and ties into the existing Marana Substation.

There are no other areas identified for the benefit of wildlife or other important wildlife concentration areas such as critical habitat or important bird areas that could be considered Areas of Biological Wealth in the Study Area.

### **Special Status Species**

Table C-1 addresses species listed in the reports from the HDMS and IPaC databases. Many species in the databases are predicted to be present based on habitat models, which are typically broad, coarse-level modeling efforts used to suggest where additional field evaluations may be initiated but may not recognize inappropriate habitat on a local level. Table C-1 provides summary information, including notes on whether each species may be present in the Study Area. If a species may be present, Exhibit C includes a discussion of the species and how it may be affected by the Project.

While most of the Proposed Route has been previously disturbed for agricultural, commercial, residential, and industrial development, undisturbed native vegetation remains near the western end of the Proposed Route along the Santa Cruz River and immediately before the terminus of the line, and on the Tortolita Mountains alluvial fan at the eastern end. Some native plant species may be present in disturbed areas, but native plant communities are absent. Some of the sensitive species in Table C-1 are dependent on native vegetation and habitat and are not likely to be present specifically along the Proposed Route. However, some species, such as bats, raptors, and migratory birds, can live or forage in modified habitats such as that along the Proposed Route and those species with the ability to fly could pass through the area while traveling to preferred habitats. Table C-1 addresses the potential for these species to be present.

The discussions of species and potential impacts of the Project addresses species with similar habitat uses or types of impacts collectively wherever appropriate.

Determinations in Table C-1 regarding the potential presence of a species in the Study Area are based on database queries and desktop review of the habitat and species distribution or records of occurrence from the following sources:

- Non-game and Endangered Wildlife (AGFD 2022)
- The Cornell Lab – All About Birds and eBird (Cornell Lab of Ornithology © 2022)
- A Guide to the Amphibians and Reptiles of California (Nafis 2022)
- USFWS Online Resources and Species Profiles (USFWS 2022)

### **Bats**

Thirteen species of special-status bats were predicted within the Study Area based on modeling, most of which upon further evaluation are identified as potentially present due to range and/or habitat. These species are discussed together here because the potential issues are similar for all species. The Study Area appears to support potentially suitable native roost habitat for some of the bat species in the larger trees along the Santa Cruz River and under the bridge crossing the Santa Cruz River, where expansion joints that could be used for bat roosting were noted. Other anthropogenic features in the Study Area, such as old buildings, may also support roosting by some species of these bats. The region surrounding the Study Area likely includes native roost habitat such as rock crevices, caves, or mines in the mountains. Many desert bat species prefer to forage over water, where insect prey is most available. Agricultural areas often also support high densities of insects and can be an important resource for foraging bats, and these areas are prevalent in the Study Area. Because some bat species travel long distances to forage, the Study Area likely supports foraging bats regardless of the absence of roost sites within the Study Area. Foraging habitat is also present along the Santa Cruz River within the western portion of the Study Area.

### **Terrestrial Mammals**

Modeling predicts a total of seven terrestrial mammals within the Study Area, and an eighth species, Sonoran pronghorn (*Antilocapra americana sonoriensis*), was identified in the IPaC as potentially present. Due to lack of native habitat and limited distribution for some mammal species, some of those species are not likely to be present in the Study Area. Most of the species could occur infrequently, most likely either along the Santa Cruz River or on the undisturbed Tortolita Mountains alluvial fan, although some may spend time in and around agricultural fields.

### **Raptors**

Three raptor species have been documented within three miles of the Proposed Route according to the HDMS, including western burrowing owl (*Athene cunicularia hypugaea*), American peregrine falcon (*Falco peregrinus anatum*), and cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*). In addition, the Sonoran Desert population of the bald eagle (*Haliaeetus leucocephalus*) and ferruginous hawk (*Buteo regalis*) have predicted ranges that include the Study Area. Based on habitat, distribution, and known behavior, the western burrowing owl is the only species likely to breed within or be present in the Study Area on more than a transient basis. The western burrowing owl may be found where they have the opportunity to modify existing small mammal burrows in areas with soft soils and open vegetation structure,

including grasslands, desert scrub, and agricultural areas. This species is also known to use anthropogenic features such as culverts for nesting and roosting.

The bald eagle and cactus ferruginous pygmy-owl may be found along the Santa Cruz River and the cactus ferruginous pygmy-owl could also be found in upland areas where saguaros, large trees, and relatively diverse vegetation is present, but suitable nesting habitat for the bald eagle is not present within the Study Area and the cactus ferruginous pygmy-owl has no recent occupancy near Tucson (Flesch 2018). The American peregrine falcon may forage in the area but, like the bald eagle, has no suitable nest habitat available in the Study Area. The ferruginous hawk is a winter resident in Arizona and could occasionally forage within the Study Area.

### **Waterbirds**

Waterbirds listed as potentially present in the Study Area, based on HDMS and IPaC, are wood duck (*Aix sponsa*), American bittern (*Botaurus lentiginosus*), and California least tern (*Sterna antillarum browni*). The wood duck and American bittern prefer bodies of water with vegetation, although either species may occasionally be observed in non-typical habitat. These species may only be present in manmade bodies of water surrounding the Study Area and are not likely to occur in the Santa Cruz River corridor within the Study Area. The California least tern is a shorebird species and is not likely to inhabit the Study Area but may occur on a transient basis.

### **Other Birds**

The western distinct population segment of the yellow-billed cuckoo (*Coccyzus americanus*) and southwestern willow flycatcher (*Empidonax traillii extimus*) are bird species documented within three miles of the Proposed Route, although the IPaC does not include the southwestern willow flycatcher on their list of species for the Study Area, presumably because the riparian vegetation along the Santa Cruz River within the Study Area does not appear in their system as appropriate nesting habitat for the species. These species may potentially occur in the Study Area along the Santa Cruz River. No critical habitat has been designated for either of these species within the Study Area.

Other species listed in the data as potentially present within the Study Area include:

- gilded flicker (*Colaptes chrysoides*)
- Sprague's pipit (*Anthus spragueii*)
- Gila woodpecker (*Melanerpes uropygialis*)
- Lincoln's sparrow (*Melospiza lincolnii*)
- Abert's towhee (*Melospiza aberti*)
- savannah sparrow (*Passerculus sandwichensis*)
- rufous-winged sparrow (*Peucaea carpalis*)
- desert purple martin (*Progne subis hesperia*)
- yellow warbler (*Setophaga petechia*)
- LeConte's thrasher (*Toxostoma lecontei*)
- pacific wren (*Troglodytes pacificus*)
- Arizona Bell's vireo (*Vireo bellii arizonae*)

Gila woodpecker, gilded flicker, Lincoln's sparrow, Abert's towhee, savannah sparrow, rufous-winged sparrow, desert purple martin, yellow warbler, and Arizona Bell's vireo may be present due to their potential use of urban habitat, agricultural areas, and/or the Santa Cruz River corridor. Sprague's pipit, LeConte's thrasher, and Pacific wren vireo are less likely to occur due to the urban environment and lack of intact habitat. These species may still occasionally forage or disperse throughout the Study Area.

The IPaC also lists the following USFWS Birds of Conservation Concern (BCC) for the Study Area:

- Bendire's thrasher (*Toxostoma bendirei*)
- Costa's Hummingbird (*Calypte costae*)
- Gila woodpecker (*Melanerpes uropygialis*)
- Lawrence's goldfinch (*Carduelis lawrencei*)
- Long-eared owl (*Asio otus*)

Gila woodpecker is likely to be present in the Study Area throughout the entire year. The other species are less likely to occur due to lack of intact habitat but may forage or migrate through the Study Area.

### **Reptiles**

The Sonoran desert tortoise (*Gopherus morafkai*) and Gila monster (*Heloderma suspectum*) are reptile species documented within three miles of the Proposed Route. These species most likely occur in the rocky mountain slopes outside of the Study Area. Tortoises are likely to be found in the Study Area only as transients or at most in low numbers on the eastern fringe of the Study Area and are unlikely to be more than transients even on the eastern end of the Proposed Route where it is closest to mountain slopes. Gila monsters have more potential to occur within the Study Area but are also likely restricted mainly to the eastern end, if present.

The variable sandsnake (*Chilomeniscus stramineus*), Sonoran whipsnake (*Coluber bilineatus*), regal horned lizard (*Phrynosoma solare*), and saddled leaf-nosed snake (*Phyllorhynchus browni*) are modeled as potentially present in the Study Area, most likely to occur in the remnant desert areas of the urban fringes and along the Santa Cruz River corridor and less likely in agriculture fields.

### **Amphibians**

The Sonoran green toad (*Anaxyrus retiformis*) and Sonoran desert toad (*Incilius alvarius*) were modeled as potentially present in the Study Area. Both would most likely be found along the riparian corridors and Santa Cruz River, wandering into the surrounding upland areas.

### **Insects**

The monarch butterfly (*Danaus plexippus*) was the only insect identified as potentially present in the Study Area. This species is likely to migrate through the Study Area during the spring and summer months between California and Mexico.

## IMPACT ASSESSMENT RESULTS

### Bats

Bats can collide with manmade structures, particularly during long-distance migration. Migrating bats often fly high above ground level and do not actively echolocate. However, during normal foraging activity, the special-status bats actively use echolocation and are typically able to detect and avoid features such as overhead transmission lines. No information suggests that transmission lines in a setting such as the Study Area would pose a risk to special-status bats. Ground disturbance from the Project, mainly taking place in previously disturbed areas and farm fields, would not appreciably affect any special-status bat species by removing foraging habitat. Abundant foraging habitat is present in farmland throughout the Study Area and in riparian habitat along the Santa Cruz River to the west. Some bats may roost in the expansion joints in the bridge that crosses the Santa Cruz River, but construction of support structures on either side of the bridge and stringing of conductor between those new structures is not expected to result in disturbance that exceeds the disturbance of the regular traffic that passes over the bridge. Since work will occur during daylight hours, impacts on foraging bats are not anticipated and impacts to roosting habitat are expected at most to potentially include a few of the trees at the Santa Cruz River crossing, where other trees are abundant along the edge of the river.

### Birds

Transmission lines can pose a collision risk to birds, including raptors (Avian Power Line Interaction Committee [APLIC] 2012). However, many factors influence whether birds are likely to collide with a specific transmission line. Birds often attempt to fly above transmission lines and other obstacles.

Electrical transmission and distribution lines can also cause bird electrocution, although the risk is highest with lower-voltage lines. Electrocution occurs when a bird simultaneously contacts energized and grounded electrical components. High-voltage lines require spacing between those components that cannot be spanned even by very large birds, so that electrocution risk is precluded almost entirely (APLIC 2006). The transmission line would be designed in accordance with APLIC guidelines to avoid the risk of electrocution to birds.

Most special-status birds are not likely to nest in the Study Area, or more specifically along the Proposed Route, given the nearly entire altered vegetation and ongoing human disturbance and activity associated with agriculture and other use. However, burrowing owls can occupy and nest in fallow farmland, field margins, and canal banks. Because burrowing owls may in some cases retreat underground when alarmed rather than flying, and because their nests are underground, they are at risk of harm from ground-disturbing activities such as that resulting from construction of transmission structures for the Project. Burrowing owls may be present and a field survey of the Proposed Route is recommended prior to construction in appropriate habitat to determine whether burrowing owls inhabit any areas proposed for disturbance. Although it is unlikely that cactus ferruginous pygmy-owls would be present, there is potential on the alluvial fan at the east end of the Study Area or along the Santa Cruz River.

Special-status birds may use the Study Area, but it is not anticipated that any special-status birds are dependent on the disturbed, altered habitat present in the Study Area. However, ground disturbance and vegetation removal occurring due to the Project may impact nesting birds, if they are present.

## **Mammals, Reptiles, and Amphibians**

Ground disturbance creates a risk of harm to any small, terrestrial mammals, reptiles, and amphibians. While some active, diurnal species may avoid construction activities and move out of work areas, burrowing and nocturnal species would not. Although it is unlikely that there are suitable shelters for the Sonoran desert tortoise and Gila monster in proposed disturbance areas, both species have the potential to be present. Survey of disturbance areas in appropriate habitat for the species is recommended immediately prior to the disturbance.

## **Insects**

Since the Project is likely used only as a migratory flyway for the monarch butterfly, impacts to this species are anticipated to be negligible, in part due to the highly disturbed landscape in the Study Area.

## **MITIGATION MEASURES**

Because the Project would be constructed mostly in areas subject to previous disturbance and outside of areas that provide essential habitat for rare or endangered species, impacts on most special-status species present in the region would not occur or would not rise to a level that would warrant mitigation. The following measures address the risk that electrical infrastructure poses to special-status species:

- Transmission structures would be constructed in compliance with standards provided by APLIC (2006, 2012). When these standards are used, the risk of electrocution and collisions for birds, including large birds and all special-status species in the Study Area, is essentially eliminated.
- Preconstruction surveys for burrowing owls would be conducted at disturbance sites in appropriate habitat by qualified biologists, according to protocols currently accepted by the AGFD. Surveys would be conducted at the appropriate time to allow for addressing active burrows without delaying construction. That timing can vary depending on the season. Burrows occupied by burrowing owls would be avoided if feasible. If any burrowing owl relocation is necessary, this would be performed by a licensed wildlife rehabilitator.
- If construction occurs during the peak nesting bird season (March 1 – August 31), a migratory bird and raptor nest survey would be performed prior to any vegetation removal or ground disturbance to avoid impacts on nesting migratory birds and raptors. Should active nests be found, the nest would be protected by an appropriately sized buffer and avoided until young birds fledge.
- Survey for Sonoran desert tortoise and Gila monster would be conducted in appropriate habitat by qualified biologists immediately prior to disturbance, using protocols accepted by AGFD. Burrows occupied by Sonoran desert tortoises would be avoided if feasible. If any Sonoran desert tortoise relocation is necessary, this would be performed by a licensed biologist.
- Impacts to native plants will be minimal due to the disturbed nature of most of the Proposed Route. The three areas where vegetation communities will be most impacted are on the Tortolita Mountains alluvial fan, primarily east of the CAP, at Santa Cruz River crossing, and at the western

1,000 feet of the route. Due to the presence of existing roads, disturbance for access roads in those areas is expected to be minimal and disturbance for transmission structure construction will avoid native vegetation to the extent practicable. On the alluvial fan on ASLD lands, ASLD will be compensated for protected native plants that will be disturbed for transmission structure construction. At the Santa Cruz River crossing, the riparian vegetation along the edge of the river will be between transmission structures, but some removal of trees and other vegetation may be necessary within the narrow conductor line corridor for stringing of conductor and to remove fire hazard directly under the conductor, if taller trees are present.

- Crossing the Santa Cruz River will require crossing PCRFCF FLAP and CLS lands. Construction will be in compliance with any FLAP and CLS restrictions on disturbance, which will further ensure minimal resource impacts at the Santa Cruz River.

## CONCLUSIONS

The Project is not likely to significantly affect any rare species. It is unlikely that any present ESA-listed species would be impacted or that SGCN Tier 1A or 1B species would be affected more than minimally by this Project. Of the three areas with relatively currently unimpacted vegetation communities, one would be subject to ASLD compensation (on the Tortolita Mountains alluvial fan), one would be subject to PCRFCF oversight of impacts (Santa Cruz River crossing), and one has sparse native vegetation and will have limited impacts due to the short crossing (approximately 1,000 feet of creosote flat at the west end). Other environmental protection measures would also be in place. The risk that electrical infrastructure poses to birds would be addressed by following standard guidelines as design features for the Project, and preconstruction surveys for the burrowing owl, migratory birds, raptors, Sonoran desert tortoises, and Gila monsters would address potential impacts on these species.

**Table C-1 – Special-Status Species Results for the Study Area**

<b>Common Name Scientific Name</b>	<b>Status</b>	<b>Habitat</b>	<b>Potential to Occur in Study Area</b>
<b>Mammals</b>			
Harris' antelope squirrel <i>Ammospermophilus harrisi</i>	SGCN 1B	Desert habitats in Arizona with cacti and desert shrubs, and open plains with gravel and sand.	Possible, most likely on remaining native desert areas.
Ocelot <i>Leopardus pardalis</i>	LE, SGCN1A	Southeastern Arizona, although limited in range; areas of dense cover or vegetation and high prey density outside of open country; thorn scrub and deciduous forests in Sonora, although little is known about habitat use in Arizona.	Not likely due to extreme rarity, lack of habitat and urbanization.
Jaguar <i>Panthera onca</i>	LE, SGCN1A	Thorn scrub, desert scrub, lowland desert, mesquite grassland, Madrean oak woodland and pine-oak woodland southeastern Arizona and Mexico.	Not likely due to extreme rarity, lack of habitat and urbanization.
Banner-tailed kangaroo rat <i>Dipodomys spectabilis</i>	S, SGCN 1B	Desert grasslands with sparse shrubs. Prefer areas with hard or gravelly soils for burrow construction.	Possible on appropriate remaining native desert areas.
Antelope jackrabbit <i>Lepus alleni</i>	SGCN 1B	Occurs in grassy, shrubby, or shrub-grass, or mesquite woodland habitat.	Possible on appropriate remaining native desert areas.
Little pocket mouse <i>Perognathus longimembris</i>	SGCN 1B	Range within Arizona where its natural habitat is dry lowland grassland.	Possible, most likely on remaining native desert areas.
Kit fox <i>Vulpes macrotis</i>	SGCN 1B	Occurs in open desert, shrubby, or shrub-grass habitat; found year-round, pups den from February to April.	Possible.
Sonoran pronghorn <sup>1</sup> <i>Antilocapra americana sonoriensis</i>	EXPN	Dry plains and desert in broad alluvial valleys separated by granite mountains and mesas.	Not likely present due to limited distribution and urbanization.
<b>Bats</b>			
Pale Townsend's big-eared bat <i>Corynorhinus townsendii pallescens</i>	SC, SGCN1B	Day roosts and maternity and hibernation colonies in caves, mines, or buildings; night roosts may include caves, buildings, and tree cavities; associated with mesic forested habitats but occupies a broad range of habitats including arid scrub, pine forest, pinyon juniper, and wooded canyons between 500 and 8,400 feet in elevation. range throughout Arizona.	Possibly present due to range and usage of anthropogenic features.
Lesser long-nosed bat <i>Leptonycteris yerbabuenae</i>	SC, SGCN 1A	Desert grassland and shrubland up to the oak transition. They roost in caves, mine tunnels, and occasionally in old buildings.	Possibly present foraging along the Santa Cruz River or where flowering columnar cacti and agave are present.
Spotted bat <i>Euderma maculatum</i>	SC, SGCN1B	Roosts in crevices and cracks of cliff faces; sometimes roosts in caves or in buildings near cliffs; variety of habitats including low to high deserts, riparian areas, ponderosa, and spruce-fir forests below 10,600 feet in elevation. Range throughout Arizona.	Possibly present foraging due to range and usage of anthropogenic features

Underwood's bonnetedbat <i>Eumops underwoodi</i>	SC, SGCN1B	Roost in rock crevices on cliff faces and hollowed trees. Found in mesquite/grassland, and Sonoran Desert habitat.	Possibly present foraging due to nearby rocky mountain slopes and cliffs.
Greater western bonneted bat <i>Eumops perotis californicus</i>	SC, SGCN 1B	Widespread throughout desert scrub, chaparral, oak woodland, ponderosa pine belt, mixed conifer forests and high elevation meadows Roost in rock slabs, boulders, and buildings.	Possibly present due to range and usage of anthropogenic features.
Western red bat <i>Lasiurus blossevillii</i>	SGCN 1B	Roosts in trees, particularly cottonwoods. Associated with broad-leaf deciduous riparian forests and woodlands from 1,900 to 7,200 feet in elevation; in Arizona, range includes northwestern through southeastern portions of the state.	Possibly present foraging in project vicinity where riparian areas contain trees.
Western yellow bat <i>Lasiurus xanthinus</i>	SGCN 1B	Riparian woodland habitats where they roost in trees such as <i>Populus fremontii</i> , <i>Platanus wrightii</i> , and <i>Quercus arizonica</i> and desert environments.	Possibly present foraging in project vicinity where riparian areas contain trees.
California leaf-nosed bat <i>Macrotus californicus</i>	SC, SGCN1B	Caves and abandoned mines in deserts of southwest North America.	Possible foraging from potential roosts in surrounding mountains with mine features or caves.
Arizona myotis <i>Myotis occultus</i>	SC, SGCN1B	Day roosts and maternity colonies in tree cavities and crevices; maternity colonies also in buildings and bridges; winter roost records from mines; riparian areas and in ponderosa pine and oak-pine woodland near water below 8,600 feet; also found along permanent water; in Arizona, range includes central band from east to west and north-central portions of the state	Not likely due to unsuitable habitat.
Cave myotis <i>Myotis velifer</i>	SC, SGCN1B	Cave habitat but will also roost in alternative areas such as mines, rock crevices, abandoned buildings, barns, and under bridges.	Possibly present since may use anthropogenic features and there are occurrence records within three miles of the Proposed Route.
Yuma myotis <i>Myotis yumanensis</i>	SC, SGCN1B	In spring through fall, found in desert scrub, riparian, woodlands, and forests; however, this species is closely associated with water and cliffs.	Possibly present spring through fall due to usage of anthropogenic features and range.
Pocketed free-tailed bat <i>Nyctinomops femorosaccus</i>	SGCN 1B	Inhabits semiarid desert lands and roosts can be found in caves, tunnels, mines, and rock crevices or hanging under the roof tiles of buildings; typically found in large colonies.	Possibly present foraging due to usage of anthropogenic features and range.

Brazilian free-tailed bat <i>Tadarida brasiliensis</i>	SGCN 1B	Found in a wide variety of habitats from desert communities through pinyon- juniper woodlands and pine-oak forests at elevations up to approximately 9,000 feet; maternity colonies and roosts found in limestone caves, abandoned mines, bridges, buildings, and hollow trees; range throughout Arizona.	Possibly present foraging due to usage of anthropogenic features and range.
<b>Birds</b>			
Western burrowing owl <sup>2</sup> <i>Athene cunicularia hypugaea</i>	SC, SGCN1B	Found year-round of portions of Arizona; occurs in open areas, areas with mammal burrows, and areas that have been cleared for human use; considered migratory in northern Arizona.	Likely to occur due to known use of urban areas by this species, particularly agricultural areas, and anthropogenic features such as culverts and pipes.
Yellow-billed cuckoo (Western DPS) <sup>1,2</sup> <i>Coccyzus americanus</i>	LT, SGCN1A	Winters in South America; during spring through early fall, breeds typically in riparian woodland vegetation (cottonwood [ <i>Populus</i> spp.], willow [ <i>Salix</i> spp.], or saltcedar [ <i>Tamarix</i> spp.]) at elevations below 6,600 feet; dense understory foliage appears to be an important factor in nest site selection	Possible to occur along the riparian corridor and Santa Cruz River, but riparian vegetation not well developed in the Study Area. Occurrence recorded within three miles of the Proposed Route.
Southwestern willow flycatcher <sup>1,2</sup> <i>Empidonax traillii extimus</i>	LE, SGCN1A	Late spring breeder in Arizona found in riparian forests with trees and thickets where it nests.	Not likely present due to unsuitable riparian vegetation along the Santa Cruz River but may migrate through or forage. There are occurrence records within three miles of the Proposed Route.
American peregrine falcon <sup>2</sup> <i>Falco peregrinus anatum</i>	SC, SGCN1A	Breeds in open areas with cliffs; occurs year-round in Arizona within landscapes having cliffs and rivers; nearly any open habitat; mudflats, lake edges, and mountain chains.	Possible to occur in the Study Area and may forage in agricultural areas. Occurrence recorded within three miles of the Proposed Route.
Cactus ferruginous pygmy-owl <i>Glaucidium brasilianum cactorum</i>	PT, SGCN 1B	Found along streamside cottonwoods, willows, and mesquite bosques, usually with saguaros on nearby slopes. Present in Sonoran riparian deciduous woodland, within Arizona upland subdivision and Sonoran desert scrub	Not likely to occur along the riparian corridor and Santa Cruz River. Despite occurrence recorded within three miles of the Proposed Route, current occupancy near Tucson has not been recorded.
Bald eagle (Sonoran Desert population) <sup>2</sup> <i>Haliaeetus leucocephalus</i> pop. <sup>3</sup>	SC, BGEPA, SGCN 1A	Prefers mature trees and snags near water for breeding in winter/spring; forages in a variety of habitats, including dry areas in summer/fall/winter; found anywhere in Arizona during winter.	Not likely due to lack of suitable water sources and mature trees but may forage in open areas.
Wood duck <i>Aix sponsa</i>	SGCN 1B	Wooded swamps, marshes, streams, beaver ponds, and small lakes.	Not likely due to lack of suitable water habitat in the area.

Sprague's pipit <i>Anthus spragueii</i>	SC, SGCN 1A	No known breeding records in Arizona. Prefers nesting in short-grass plains, mixed-grass prairie, and wet meadows.	Not likely due to range and improper habitat.
American bittern <i>Botaurus lentiginosus</i>	SGCN 1B	Winters in southern Arizona and uses water bodies and brackish marshes; breeds mainly in freshwater marshes containing tall vegetation.	Not likely to occur due to lack of water bodies and marshes containing tall vegetation. There are occurrence records two miles to the southeast of the Study Area.
Ferruginous hawk <i>Buteo regalis</i>	SC, SGCN 1B	Prefers to forage in open environments including grasslands or desert.	Possibly present in winter due to range and usage of anthropogenic features.
Gilded flicker <i>Colaptes chrysoides</i>	SGCN 1B	Extensive stands of giant cactus, especially saguaro, as well as desert washes with cottonwood and willow.	Possibly present due to use of urban habitat containing desert remnant habitat and on urban fringes with desert scrub
Gila woodpecker <i>Melanerpes uropygialis</i>	SGCN 1B	Stands of saguaro cactus, desert scrub, arroyos and washes, and small towns.	Likely present due to use of urban habitat containing desert remnant habitat and on urban fringes with desert scrub.
Lincoln's sparrow <i>Melospiza lincolnii</i>	SGCN 1B	Breeds in wet meadows filled with willows, alders, and sedges or patches of aspens, cottonwoods, and willows as well as shrubby areas near streams; during migration they use brushy fields, forest edges, and thickets; in winter, they use tropical forests, pine-oak forests, tropical scrub, weedy pastures, and shrubby fields.	Likely present during winter months in which agricultural lands may be used.
Abert's towhee <i>Melospiza aberti</i>	SGCN 1B	Low, dense cover along desert streams and riverbeds with cottonwoods, willows, or mesquite and suburban landscapes.	Likely present due to utilization of suburban landscapes.
Savannah sparrow <i>Passerculus sandwichensis</i>	SGCN 1B	Breed in open areas with low vegetation, including tundra to grassland, marsh, and farmland; found on the ground or in low vegetation in open areas and along the edges of roads adjacent to farms.	Likely present due to utilization of suburban landscapes including roads and farms.
Rufous-winged sparrow <i>Peucaea carpalis</i>	SGCN 1B	Nest in desert thornscrub communities. Are often found in grasslands and shrub grasslands.	Likely present due to utilization of suburban landscapes. Multiple occurrence records exist from eBird.
Desert purple martin <i>Progne subis hesperia</i>	SGCN 1B	Found in grasslands and shrub grasslands. Will nest in dead trees, saguaros, buildings, and cliffs.	Possibly present based on distribution and habitat.
Yellow warbler <i>Setophaga petechia</i>	SGCN 1B	Shrubby thickets and woods, particularly along watercourses and in wetlands; common trees include willows, alders, and cottonwoods, also a backyard species.	Likely present due to utilization of suburban landscapes.

LeConte's thrasher <i>Toxostoma lecontei</i>	SGCN 1B	Very dry, lightly vegetated desert habitat with cholla, saltbush, mesquite, and other plants tolerant of hot, arid conditions.	Not likely present due to urban environment and lack of intact desert habitat.
Pacific wren <i>Troglodytes pacificus</i>	SGCN 1B	Forested habitats from sea level to 12,000 feet; most common in old-growth evergreen forests, also deciduous forests, mixed evergreen and deciduous forests, and aspen stands; some individuals move to lower elevations in winter and use scrub oak, pinyon-juniper forests, parks, and gardens.	Not likely due to limited range in Arizona and lack of forested or scrub oak habitat and pinyon-juniper forests.
Arizona Bell's vireo <i>Vireo bellii arizonae</i>	SGCN 1B	Thickets and thorn scrub in the southwest.	Possibly present along Santa Cruz River.
California least tern <sup>1</sup> <i>Sterna antillarum browni</i>	LE	Barrier islands and beaches, dredge spoil, river islands, flat gravel rooftops, and similar habitats for nesting; forages along rivers, estuaries, bays, ocean coastlines.	Not likely present due to lack of habitat for nesting and foraging.
<b>Reptiles</b>			
Variable sandsnake <i>Chilomeniscus stramineus</i>	SGCN 1B	Dry deserts with sand or loamy soil, including sandy or gravelly washes, creosotebush flats, arroyos, and areas grown with mesquite and saguaro, and ocotillo.	Possibly present in remnant desert area on urban fringes, and in the sandy wash bottoms.
Sonoran whipsnake <i>Coluber bilineatus</i>	SGCN 1B	Rocky canyons, riparian areas, foothills, and mountains with dense vegetation in elevations and open creosotebush flats.	Possibly present along the Santa Cruz River and on Tortolita Mountain alluvium.
Tiger rattlesnake <i>Crotalus tigris</i>	SGCN 1B	Rocky slopes and bajadas in desert scrub, but also chaparral and semi-desert grassland.	Not likely present due to lack of native habitat including rocky and mountainous areas.
Sonoran collared lizard <i>Crotaphytus nebrius</i>	SGCN 1B	Rocky bajadas, hillsides, canyons, and mountain slopes, in areas with numerous large rocks and boulders.	Not likely present due to lack of native habitat including rocky and mountainous areas.
Sonoran desert tortoise <sup>1</sup> <i>Gopherus morafkai</i>	CCA, SGCN 1A	Rocky slopes and bajadas of Sonoran Desert scrub communities; often associated with palo verde mixed cacti dominated landscapes.	Possibly found along the most eastern portion of the Study Area. Occurrences recorded within three miles of the Proposed Route.
Gila monster <i>Heloderma suspectum</i>	SGCN 1A	Desert and grassland regions.	Possibly found along the most eastern portion of the Study Area. Occurrences recorded within three miles of the Proposed Route.
Desert mud turtle <i>Kinosternon sonoriense sonoriense</i>	SGCN 1B	Normally occurs in ponds and slow-moving tree-lined watercourses, including quiet pools in streams, oxbows, ponds, creeks, and cattle tanks; found in woodlands and occasionally in grasslands; needs a permanent or nearly permanent water source.	Possible to occur along the Santa Cruz River.

Sonoran coral snake <i>Micruroides euryxanthus</i>	SGCN 1B	Desert scrub, semi-desert grassland, and lower reaches of oak woodlands in bajadas and rock canyons, and rarely in valley bottoms.	Not likely due to urbanization and lack of suitable habitat.
Goode's horned lizard <i>Phrynosoma goodei</i>	SGCN 1B	Prefer sand/dune habitat with sparse vegetation.	Not likely due to improper habitat and limited distribution.
Regal horned lizard <i>Phrynosoma solare</i>	SGCN 1B	Sandy desert scrub.	Possibly present in remaining desert scrub on east end of Study Area.
Saddled leaf-nosed snake <i>Phyllorhynchus browni</i>	SGCN 1B	Sandy, gravelly, and rock desert scrub to semi-desert grassland	Possibly present in remaining desert scrub on east end of Study Area.
<b>Amphibians</b>			
Sonoran green toad <i>Anaxyrus retiformis</i>	SGCN 1B	Inhabits wash bottoms, and areas near water in semi-arid mesquite-grassland, creosote bush desert, and upland saguaro-paloverde desert scrub.	Possibly present near Santa Cruz River.
Sonoran desert toad <i>Incilius alvarius</i>	SGCN 1B	Oak-pine woodlands, grasslands, desert scrub, thorn scrub, and deciduous forests; also, semi-aquatic regions near streams, springs, rain pools, and ditches.	Possibly present along the Santa Cruz River and other wash bottoms.
<b>Invertebrates</b>			
Monarch butterfly <i>Danaus plexippus</i>	C	Across North America wherever suitable feeding, breeding, and overwintering habitat exists; during summer, western monarchs live in canyons or riparian areas of the west, southwest, inland California, and the inland northwest states up to British Columbia.	Likely present during spring and summer months during migration. There are occurrence records within three miles of the Study Area

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*Attachment C-1 — Arizona Environmental Outline  
Review Tool Report*

# Arizona Environmental Online Review Tool Report



## ***Arizona Game and Fish Department Mission***

***To conserve Arizona's diverse wildlife resources and manage for safe, compatible outdoor recreation opportunities for current and future generations.***

### **Project Name:**

Saguaro-Marana 115 kV line

### **Project Description:**

New proposed powerline

### **Project Type:**

Energy Storage/Production/Transfer, Energy Transfer, Power line/electric line (new)

### **Contact Person:**

Greg Taylor

### **Organization:**

Westland Resources LLC

### **On Behalf Of:**

OTHER

### **Project ID:**

HGIS-15742

***Please review the entire report for project type and/or species recommendations for the location information entered. Please retain a copy for future reference.***

**Disclaimer:**

1. This Environmental Review is based on the project study area that was entered. The report must be updated if the project study area, location, or the type of project changes.
2. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area. This review is also not intended to replace environmental consultation (including federal consultation under the Endangered Species Act), land use permitting, or the Departments review of site-specific projects.
3. The Departments Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there. HDMS data contains information about species occurrences that have actually been reported to the Department. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
4. HabiMap Arizona data, specifically Species of Greatest Conservation Need (SGCN) under our State Wildlife Action Plan (SWAP) and Species of Economic and Recreational Importance (SERI), represent potential species distribution models for the State of Arizona which are subject to ongoing change, modification and refinement. The status of a wildlife resource can change quickly, and the availability of new data will necessitate a refined assessment.

**Locations Accuracy Disclaimer:**

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Report is solely responsible for the project location and thus the correctness of the Project Review Report content.

**Recommendations Disclaimer:**

1. The Department is interested in the conservation of all fish and wildlife resources, including those species listed in this report and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.
2. Recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation).
3. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information submitted for your proposed project. These recommendations are preliminary in scope, designed to provide early considerations on all species of wildlife.
4. Making this information directly available does not substitute for the Department's review of project proposals, and should not decrease our opportunity to review and evaluate additional project information and/or new project proposals.
5. Further coordination with the Department requires the submittal of this Environmental Review Report with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map). Once AGFD had received the information, please allow 30 days for completion of project reviews. Send requests to:

**Project Evaluation Program, Habitat Branch**

**Arizona Game and Fish Department**

**5000 West Carefree Highway**

**Phoenix, Arizona 85086-5000**

**Phone Number: (623) 236-7600**

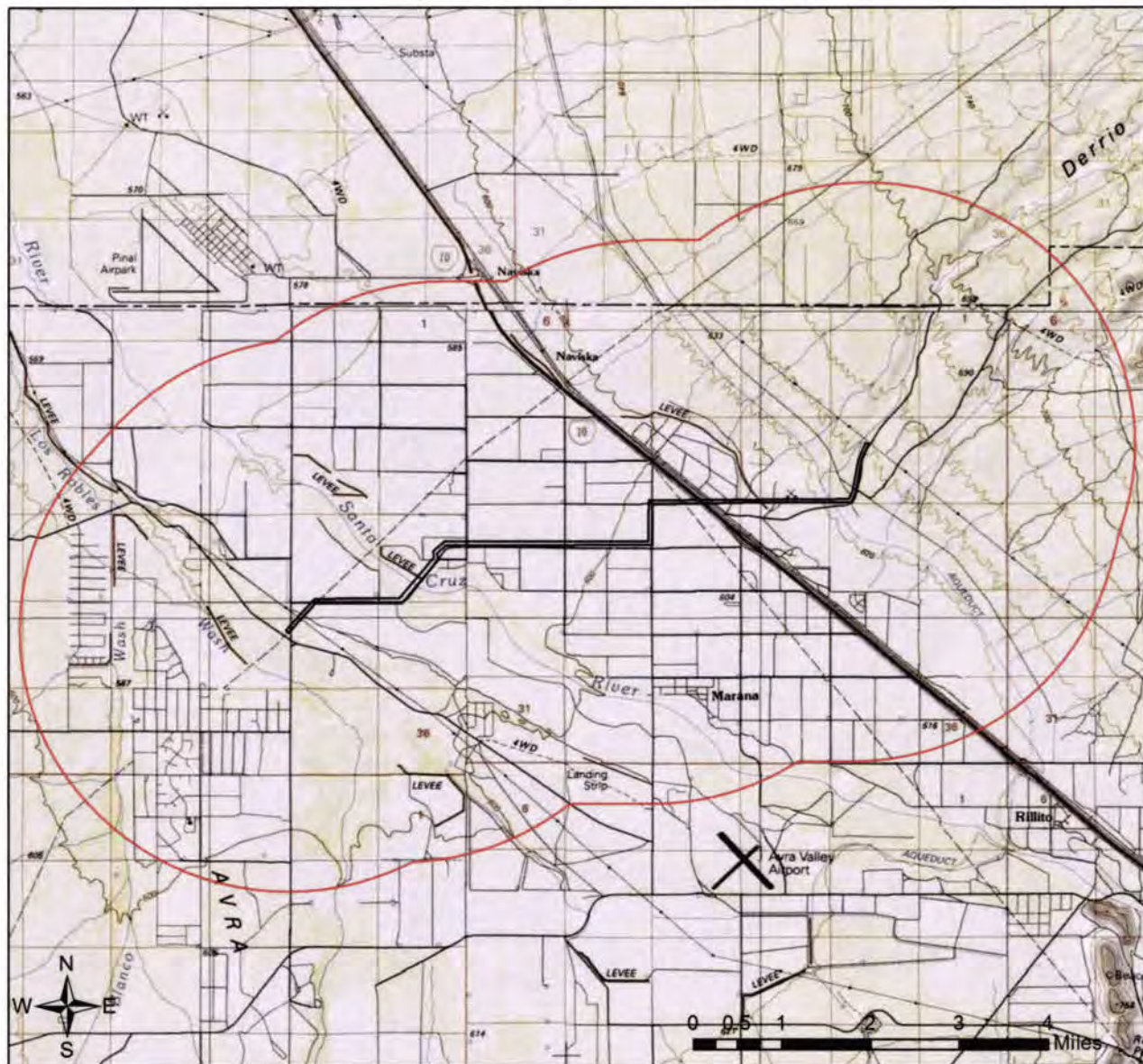
**Fax Number: (623) 236-7366**

**Or**

[PEP@azgfd.gov](mailto:PEP@azgfd.gov)

6. Coordination may also be necessary under the National Environmental Policy Act (NEPA) and/or Endangered Species Act (ESA). Site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected agencies

## Saguaro-Marana 115 kV line USA Topo Basemap With Locator Map



- ☐ Project Boundary
- ☐ Buffered Project Boundary

Project Size (acres): 225.01

Lat/Long (DD): 32.4610 / -111.2508

County(s): Pima

AGFD Region(s): Tucson

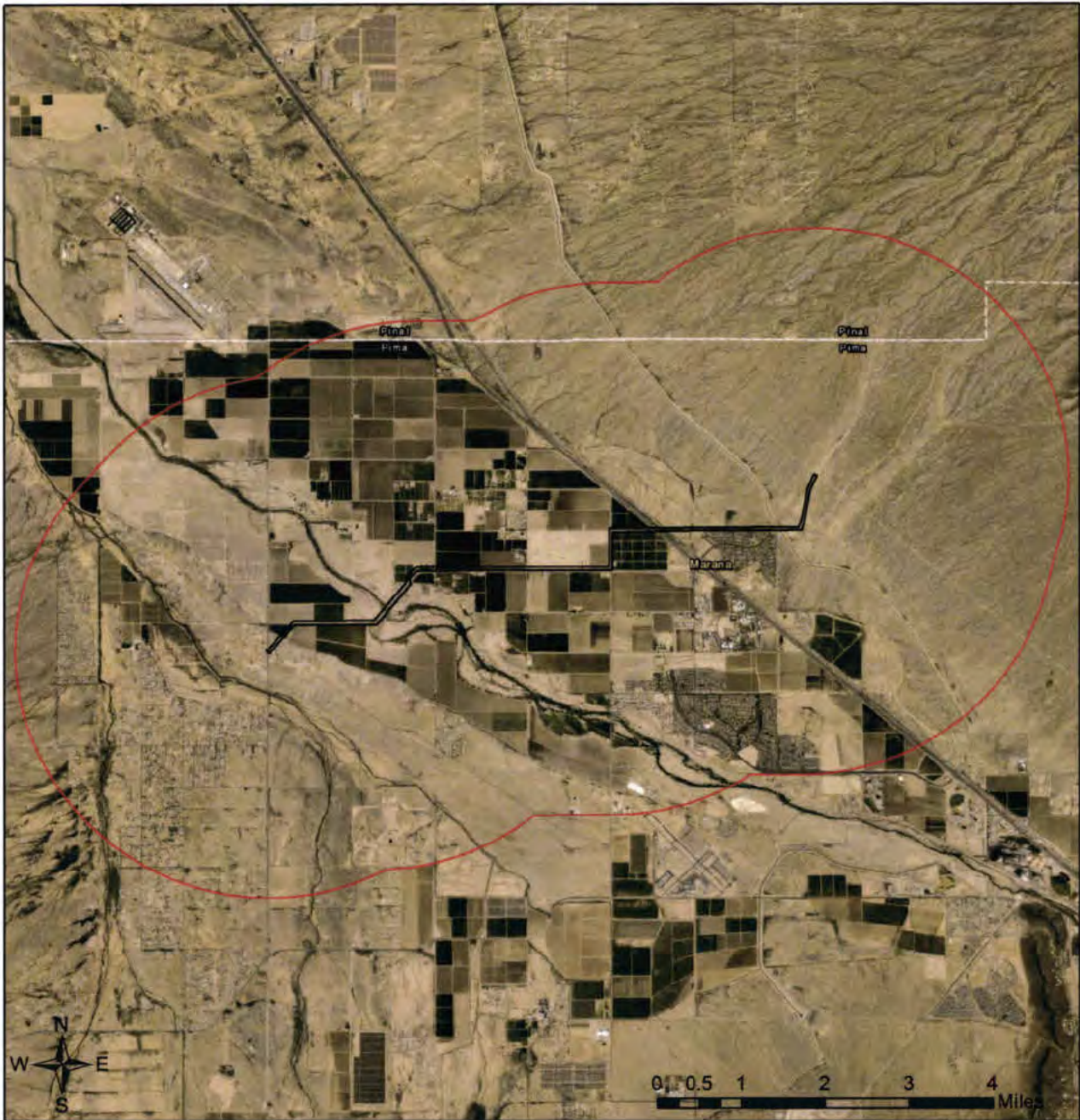
Township/Range(s): T11S, R10E; T11S, R11E

USGS Quad(s): MARANA; WEST OF MARANA

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, Increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap



Saguaro-Marana 115 kV line  
Web Map As Submitted By User



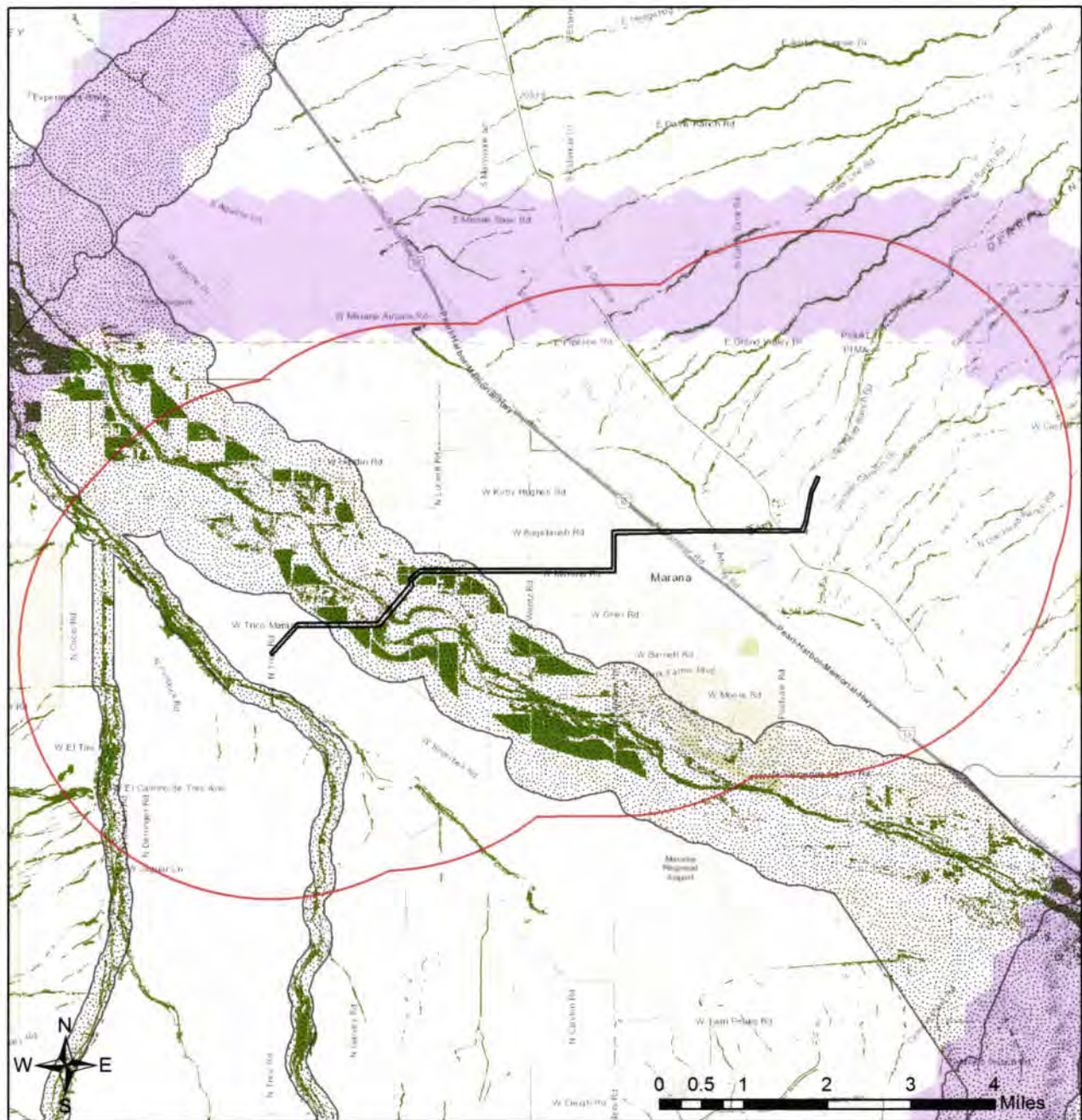
- Project Boundary
- Buffered Project Boundary
- Critical Habitat
- Important Bird Areas

Project Size (acres): 225.01  
Lat/Long (DD): 32.4610 / -111.2508  
County(s): Pima  
AGFD Region(s): Tucson  
Township/Range(s): T11S, R10E; T11S, R11E  
USGS Quad(s): MARANA; WEST OF MARANA

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

## Saguaro-Marana 115 kV line

### Important Areas



- Project Boundary
- Buffered Project Boundary
- Wildlife Connectivity
- Important Connectivity Zones
- Pinal County Riparian
- Critical Habitat
- Important Bird Areas

Project Size (acres): 225.01

Lat/Long (DD): 32.4610 / -111.2508

County(s): Pima

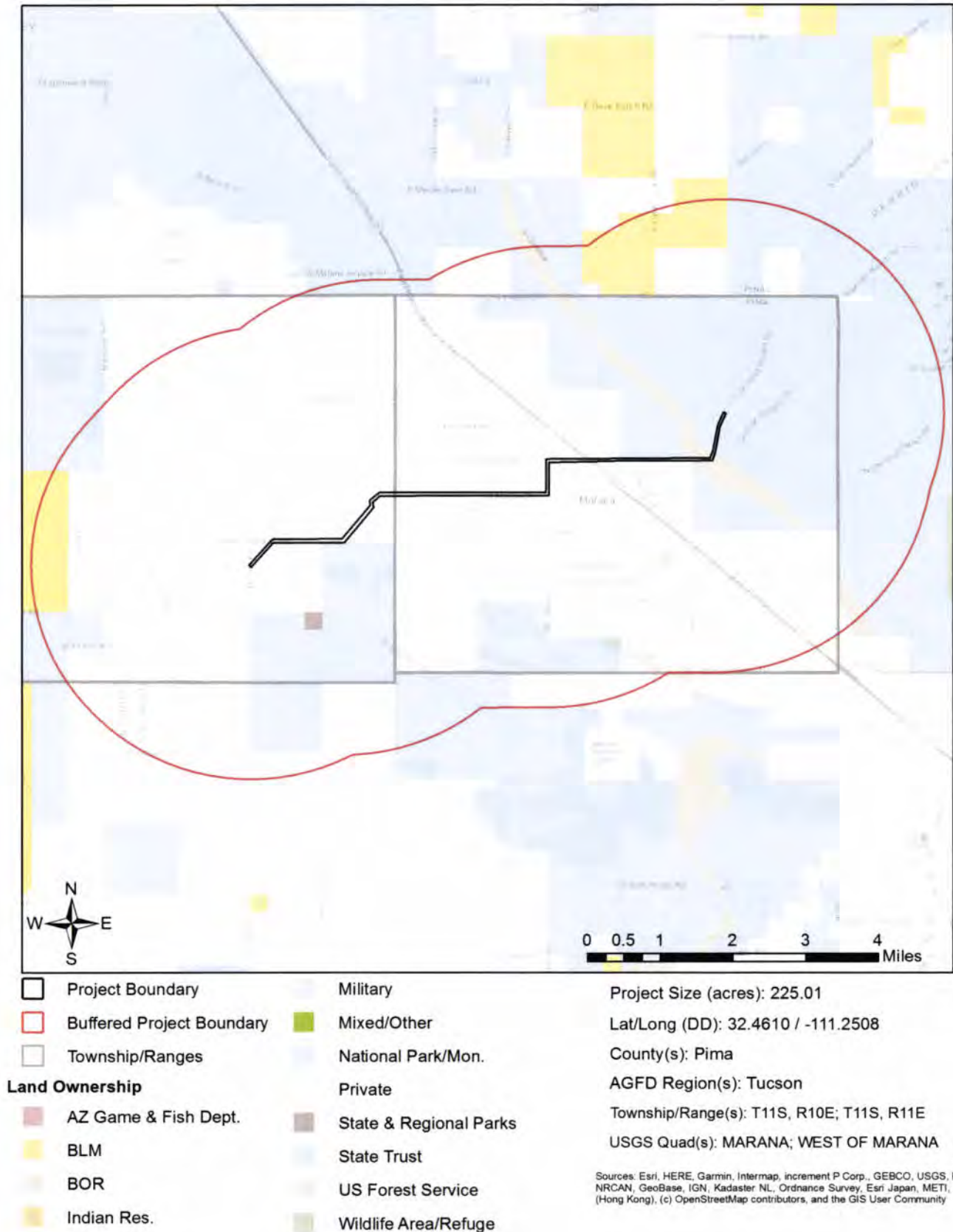
AGFD Region(s): Tucson

Township/Range(s): T11S, R10E; T11S, R11E

USGS Quad(s): MARANA; WEST OF MARANA

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Saguaro-Marana 115 kV line  
Township/Ranges and Land Ownership



**Special Status Species Documented within 3 Miles of Project Vicinity**

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Athene cunicularia hypugaea	Western Burrowing Owl	SC	S	S		1B
Bat Colony						
Coccyzus americanus	Yellow-billed Cuckoo (Western DPS)	LT	S	S		1A
Danaus plexippus	Monarch	C		S		
Empidonax traillii extimus	Southwestern Willow Flycatcher	LE				1A
Falco peregrinus anatum	American Peregrine Falcon	SC	S	S		1A
Glaucidium brasilianum cactorum	Cactus Ferruginous Pygmy-owl	PT	S	S		1B
Gopherus morafkai	Sonoran Desert Tortoise	CCA	S	S		1A
Heloderma suspectum	Gila Monster					1A
Myotis velifer	Cave Myotis	SC		S		1B
Sigmodon ochrognathus	Yellow-nosed Cotton Rat	SC				1C

Note: Status code definitions can be found at <https://www.azgfd.com/wildlife/planning/wildlifeguidelines/statusdefinitions/>

**Special Areas Documented that Intersect with Project Footprint as Drawn**

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
CAP Canal	Pima County Wildlife Crossing Area					
Coyote - Ironwood - Tucson Linkage Design	Wildlife Connectivity					
Riparian Area	Riparian Area					
Santa Cruz River	Pima County Wildlife Movement Area - Riparian/Wash					

Note: Status code definitions can be found at <https://www.azgfd.com/wildlife/planning/wildlifeguidelines/statusdefinitions/>

**Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models**

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Aix sponsa	Wood Duck					1B
Ammospermophilus harrisi	Harris' Antelope Squirrel					1B
Anaxyrus retiformis	Sonoran Green Toad			S		1B
Anthus spragueii	Sprague's Pipit	SC				1A
Athene cunicularia hypugaea	Western Burrowing Owl	SC	S	S		1B
Botaurus lentiginosus	American Bittern					1B
Buteo regalis	Ferruginous Hawk	SC		S		1B
Buteo swainsoni	Swainson's Hawk					1C
Calypste costae	Costa's Hummingbird					1C
Chilomeniscus stramineus	Variable Sandsnake					1B
Chionactis annulata	Resplendent Shovel-nosed Snake	SC				1C

**Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models**

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Cistothorus palustris	Marsh Wren					1C
Colaptes chrysoides	Gilded Flicker			S		1B
Coluber bilineatus	Sonoran Whipsnake					1B
Corynorhinus townsendii pallescens	Pale Townsend's Big-eared Bat	SC	S	S		1B
Crotalus tigris	Tiger Rattlesnake					1B
Crotaphytus nebrius	Sonoran Collared Lizard					1B
Dipodomys spectabilis	Banner-tailed Kangaroo Rat			S		1B
Empidonax wrightii	Gray Flycatcher					1C
Euderma maculatum	Spotted Bat	SC	S	S		1B
Eumops perotis californicus	Greater Western Bonneted Bat	SC		S		1B
Eumops underwoodi	Underwood's Bonneted Bat	SC				1B
Glaucidium brasilianum cactorum	Cactus Ferruginous Pygmy-owl	PT	S	S		1B
Gopherus morafkai	Sonoran Desert Tortoise	CCA	S	S		1A
Haliaeetus leucocephalus	Bald Eagle	SC, BGA	S	S		1A
Heloderma suspectum	Gila Monster					1A
Incilius alvarius	Sonoran Desert Toad					1B
Kinosternon sonoriense sonoriense	Desert Mud Turtle			S		1B
Lasiurus blossevillii	Western Red Bat		S			1B
Lasiurus xanthinus	Western Yellow Bat		S			1B
Leopardus pardalis	Ocelot	LE				1A
Leptonycteris yerbabuenae	Lesser Long-nosed Bat	SC				1A
Lepus alleni	Antelope Jackrabbit					1B
Macrotus californicus	California Leaf-nosed Bat	SC		S		1B
Melanerpes uropygialis	Gila Woodpecker					1B
Melospiza lincolni	Lincoln's Sparrow					1B
Melospiza aberti	Abert's Towhee		S			1B
Micrathene whitneyi	Elf Owl					1C
Micruroides euryxanthus	Sonoran Coralsnake					1B
Myiarchus tyrannulus	Brown-crested Flycatcher					1C
Myotis velifer	Cave Myotis	SC		S		1B
Myotis yumanensis	Yuma Myotis	SC				1B
Nyctinomops femorosaccus	Pocketed Free-tailed Bat					1B
Oreoscoptes montanus	Sage Thrasher					1C
Oreothlypis luciae	Lucy's Warbler					1C
Panthera onca	Jaguar	LE				1A
Passerculus sandwichensis	Savannah Sparrow					1B
Perognathus longimembris	Little Pocket Mouse	No Status				1B

**Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models**

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
<i>Peucaea carpalis</i>	Rufous-winged Sparrow					1B
<i>Phrynosoma goodei</i>	Goode's Horned Lizard					1B
<i>Phrynosoma solare</i>	Regal Horned Lizard					1B
<i>Phyllorhynchus browni</i>	Saddled Leaf-nosed Snake					1B
<i>Progne subis hesperia</i>	Desert Purple Martin			S		1B
<i>Setophaga petechia</i>	Yellow Warbler					1B
<i>Sphyrapicus nuchalis</i>	Red-naped Sapsucker					1C
<i>Spizella breweri</i>	Brewer's Sparrow					1C
<i>Sturnella magna</i>	Eastern Meadowlark					1C
<i>Tadarida brasiliensis</i>	Brazilian Free-tailed Bat					1B
<i>Toxostoma lecontei</i>	LeConte's Thrasher			S		1B
<i>Troglodytes pacificus</i>	Pacific Wren					1B
<i>Vireo bellii arizonae</i>	Arizona Bell's Vireo					1B
<i>Vulpes macrotis</i>	Kit Fox	No Status				1B

**Species of Economic and Recreation Importance Predicted that Intersect with Project Footprint as Drawn**

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
<i>Callipepla gambelii</i>	Gambel's Quail					
<i>Odocoileus hemionus</i>	Mule Deer					
<i>Pecari tajacu</i>	Javelina					
<i>Puma concolor</i>	Mountain Lion					
<i>Zenaidura macroura</i>	White-winged Dove					
<i>Zenaidura macroura</i>	Mourning Dove					

**Project Type: Energy Storage/Production/Transfer, Energy Transfer, Power line/electric line (new)**

**Project Type Recommendations:**

Minimize the potential introduction or spread of exotic invasive species, including aquatic and terrestrial plants, animals, insects and pathogens. Precautions should be taken to wash and/or decontaminate all equipment utilized in the project activities before entering and leaving the site. See the Arizona Department of Agriculture website for a list of prohibited and restricted noxious weeds at <https://www.invasivespeciesinfo.gov/unitedstates/az.shtml> and the Arizona Native Plant Society <https://aznps.com/invas> for recommendations on how to control. To view a list of documented invasive species or to report invasive species in or near your project area visit iMapInvasives - a national cloud-based application for tracking and managing invasive species at <https://imap.natureserve.org/imap/services/page/map.html>.

- To build a list: zoom to your area of interest, use the identify/measure tool to draw a polygon around your area of interest, and select "See What's Here" for a list of reported species. To export the list, you must have an account and be logged in. You can then use the export tool to draw a boundary and export the records in a csv file.

The Department recommends that wildlife surveys are conducted to determine if noise-sensitive species occur within the project area. Avoidance or minimization measures could include conducting project activities outside of breeding seasons.

For any powerlines built, proper design and construction of the transmission line is necessary to prevent or minimize risk of electrocution of raptors, owls, vultures, and golden or bald eagles, which are protected under state and federal laws. Limit project activities during the breeding season for birds, generally March through late August, depending on species in the local area (raptors breed in early February through May). Conduct avian surveys to determine bird species that may be utilizing the area and develop a plan to avoid disturbance during the nesting season. For underground powerlines, trenches should be covered or back-filled as soon as possible. Incorporate escape ramps in ditches or fencing along the perimeter to deter small mammals and herpetofauna (snakes, lizards, tortoise) from entering ditches. In addition, indirect affects to wildlife due to construction (timing of activity, clearing of rights-of-way, associated bridges and culverts, affects to wetlands, fences) should also be considered and mitigated.

Based on the project type entered, coordination with State Historic Preservation Office may be required (<http://azstateparks.com/SHPO/index.html>).

Based on the project type entered, coordination with U.S. Fish and Wildlife Service (Migratory Bird Treaty Act) may be required (<https://www.fws.gov/office/arizona-ecological-services>).

Vegetation restoration projects (including treatments of invasive or exotic species) should have a completed site-evaluation plan (identifying environmental conditions necessary to re-establish native vegetation), a revegetation plan (species, density, method of establishment), a short and long-term monitoring plan, including adaptive management guidelines to address needs for replacement vegetation.

#### **Project Location and/or Species Recommendations:**

Analysis indicates that your project is located in the vicinity of an identified **wildlife habitat connectivity feature**. The **County-level Stakeholder Assessments** contain five categories of data (Barrier/Development, Wildlife Crossing Area, Wildlife Movement Area- Diffuse, Wildlife movement Area- Landscape, Wildlife Movement Area- Riparian/Washes) that provide a context of select anthropogenic barriers, and potential connectivity. The reports provide recommendations for opportunities to preserve or enhance permeability. Project planning and implementation efforts should focus on maintaining and improving opportunities for wildlife permeability. For information pertaining to the linkage assessment and wildlife species that may be affected, please refer

to: <https://www.azgfd.com/wildlife/planning/habitatconnectivity/identifying-corridors/>.

Please contact the Project Evaluation Program ([pep@azgfd.gov](mailto:pep@azgfd.gov)) for specific project recommendations.

Analysis indicates that your project is located in the vicinity of an identified **wildlife habitat connectivity feature**. The **Detailed Wildlife Connectivity Assessments** represent ideal connections within or between intact blocks or core habitats. The blocks are currently disconnected or isolated and the linkages should be examined for improving permeability, or are currently intact and in need of preservation and/or enhancement. The reports provide recommendations for opportunities to preserve or enhance permeability. Project planning and implementation efforts should focus on maintaining and improving opportunities for wildlife permeability. For information pertaining to the linkage assessment and wildlife species that may be affected, please refer

to: <https://www.azgfd.com/wildlife/planning/habitatconnectivity/identifying-corridors/>

Please contact the Project Evaluation Program ([pep@azgfd.gov](mailto:pep@azgfd.gov)) for specific project recommendations.

HDMS records indicate that one or more **Listed, Proposed, or Candidate** species or **Critical Habitat** (Designated or Proposed) have been documented in the vicinity of your project. The Endangered Species Act (ESA) gives the US Fish and Wildlife Service (USFWS) regulatory authority over all federally listed species. Please contact USFWS Ecological Services Offices at <https://www.fws.gov/office/arizona-ecological-services> or:

**Phoenix Main Office**

9828 North 31st Avenue #C3  
Phoenix, AZ 85051-2517  
Phone: 602-242-0210  
Fax: 602-242-2513

**Tucson Sub-Office**

201 N. Bonita Suite 141  
Tucson, AZ 85745  
Phone: 520-670-6144  
Fax: 520-670-6155

**Flagstaff Sub-Office**

SW Forest Science Complex  
2500 S. Pine Knoll Dr.  
Flagstaff, AZ 86001  
Phone: 928-556-2157  
Fax: 928-556-2121

This review has identified **riparian areas** within the vicinity of your project. During the planning stage of your project, avoid, minimize, or mitigate any potential impacts to riparian areas identified in this report. Riparian areas play an important role in maintaining the functional integrity of the landscape, primarily by acting as natural drainages that convey water through an area, thereby reducing flood events. In addition, riparian areas provide important movement corridors and habitat for fish and wildlife. Riparian areas are channels that contain water year-round or at least part of the year. Riparian areas also include those channels which are dry most of the year, but may contain or convey water following rain events. All types of riparian areas offer vital habitats, resources, and movement corridors for wildlife. The Pinal County Comprehensive Plan (i.e. policies 6.1.2.1 and 7.1.2.4), Open Space and Trails Master Plan, Drainage Ordinance, and Drainage Design Manual all identify riparian area considerations, guidance, and policies. Guidelines to avoid, minimize, or mitigate impacts to riparian habitat can be found at <https://www.azgfd.com/wildlife/planning/wildlifeguidelines/>. Based on the project type entered, further consultation with the Arizona Game and Fish Department and Pinal County may be warranted.

HDMS records indicate that **Sonoran Desert Tortoise** have been documented within the vicinity of your project area. Please review the Tortoise Handling Guidelines found at: <https://www.azgfd.com/wildlife/nongamemanagement/tortoise/>

HDMS records indicate that **Western Burrowing Owls** have been documented within the vicinity of your project area. Please review the western burrowing owl resource page at: <https://www.azgfd.com/wildlife/speciesofgreatestconservneed/burrowingowlmanagement/>.

*Attachment C-2 — IPaC*



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

Arizona Ecological Services Field Office

9828 North 31st Ave

#c3

Phoenix, AZ 85051-2517

Phone: (602) 242-0210 Fax: (602) 242-2513

<http://www.fws.gov/southwest/es/arizona/>

[http://www.fws.gov/southwest/es/EndangeredSpecies\\_Main.html](http://www.fws.gov/southwest/es/EndangeredSpecies_Main.html)



In Reply Refer To:

March 14, 2022

Project Code: 2022-0019473

Project Name: Saguaro-Marana 155 kV line

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

#### To Whom It May Concern:

The Fish and Wildlife Service (Service) is providing this list under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The list you have generated identifies threatened, endangered, proposed, and candidate species, and designated and proposed critical habitat, that *may* occur within the One-Range that has been delineated for the species (candidate, proposed, or listed) and its critical habitat (designated or proposed) with which your project polygon intersects. These range delineations are based on biological metrics, and do not necessarily represent exactly where the species is located. Please refer to the species information found on ECOS to determine if suitable habitat for the species on your list occurs in your project area.

The purpose of the Act is to provide a means whereby threatened and endangered species and the habitats upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of Federal trust resources and to determine whether projects may affect federally listed species and/or designated critical habitat. A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If the Federal action agency determines that listed species or critical habitat *may be affected* by a federally funded, permitted or authorized activity, the agency must consult with us pursuant to 50

CFR 402. Note that a "may affect" determination includes effects that may not be adverse and that may be beneficial, insignificant, or discountable. An effect exists even if only one individual or habitat segment may be affected. The effects analysis should include the entire action area, which often extends well outside the project boundary or "footprint." For example, projects that involve streams and river systems should consider downstream affects. If the Federal action agency determines that the action may jeopardize a *proposed* species or may adversely modify *proposed* critical habitat, the agency must enter into a section 7 conference. The agency may choose to confer with us on an action that may affect proposed species or critical habitat.

Candidate species are those for which there is sufficient information to support a proposal for listing. Although candidate species have no legal protection under the Act, we recommend that they be considered in the planning process in the event they become proposed or listed prior to project completion. More information on the regulations (50 CFR 402) and procedures for section 7 consultation, including the role of permit or license applicants, can be found in our Endangered Species Consultation Handbook at: <http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>.

We also advise you to consider species protected under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712) and the Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. 668 *et seq.*). The MBTA prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when authorized by the Service. The Eagle Act prohibits anyone, without a permit, from taking (including disturbing) eagles, and their parts, nests, or eggs. Currently 1,026 species of birds are protected by the MBTA, including the western burrowing owl (*Athene cunicularia hypugaea*). Protected western burrowing owls can be found in urban areas and may use their nest/burrows year-round; destruction of the burrow may result in the unpermitted take of the owl or their eggs.

If a bald eagle or golden eagle nest occurs in or near the proposed project area, our office should be contacted for Technical Assistance. An evaluation must be performed to determine whether the project is likely to disturb or harm eagles. The National Bald Eagle Management Guidelines provide recommendations to minimize potential project impacts to bald eagles (see <https://www.fws.gov/birds/management/project-assessment-tools-and-guidance/guidance-documents/eagles.php> and <https://www.fws.gov/birds/management/managed-species/eagle-management.php>).

The Division of Migratory Birds (505/248-7882) administers and issues permits under the MBTA and Eagle Act, while our office can provide guidance and Technical Assistance. For more information regarding the MBTA, BGEPA, and permitting processes, please visit the following web site: <https://www.fws.gov/birds/management.php>. Guidance for minimizing impacts to migratory birds for communication tower projects (e.g. cellular, digital television, radio, and emergency broadcast) can be found at <https://www.fws.gov/migratorybirds/pdf/management/usfwscommtowerguidance2016update.pdf>.

The U.S. Army Corps of Engineers (Corps) may regulate activities that involve streams (including some intermittent streams) and/or wetlands. We recommend that you contact the

Corps to determine their interest in proposed projects in these areas. For activities within a National Wildlife Refuge, we recommend that you contact refuge staff for specific information about refuge resources, please visit <https://www.fws.gov/southwest/refuges/> to locate the refuge you would be working in or around.

If your action is on tribal land or has implications for off-reservation tribal interests, we encourage you to contact the tribe(s) and the Bureau of Indian Affairs (BIA) to discuss potential tribal concerns, and to invite any affected tribe and the BIA to participate in the section 7 consultation. In keeping with our tribal trust responsibility, we will notify tribes that may be affected by proposed actions when section 7 consultation is initiated. For more information, please contact our Tribal Coordinator, John Nystedt, at 928/556-2160 or [John\\_Nystedt@fws.gov](mailto:John_Nystedt@fws.gov).

We also recommend you seek additional information and coordinate your project with the Arizona Game and Fish Department. Information on known species detections, special status species, and Arizona species of greatest conservation need, such as the western burrowing owl and the Sonoran desert tortoise (*Gopherus morafkai*) can be found by using their Online Environmental Review Tool, administered through the Heritage Data Management System and Project Evaluation Program (<https://www.azgfd.com/wildlife/planning/projevalprogram/>).

We appreciate your concern for threatened and endangered species. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office. If we may be of further assistance, please contact our Flagstaff office at 928/556-2157 for projects in northern Arizona, our general Phoenix number 602/242-0210 for central Arizona, or 520/670-6144 for projects in southern Arizona.

Sincerely,  
/s/

Mark A. Lamb  
Acting Field Supervisor  
Attachment

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

## Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Arizona Ecological Services Field Office**

9828 North 31st Ave

#c3

Phoenix, AZ 85051-2517

(602) 242-0210

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## Project Summary

Project Code: 2022-0019473

Event Code: None

Project Name: Saguaro-Marana 155 kV line

Project Type: Distribution Line - New Construction - Above Ground

Project Description: A proposed powerline

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@32.4619763,-111.23391519950906,14z>



Counties: Pima County, Arizona

## Endangered Species Act Species

There is a total of 8 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

## Mammals

NAME	STATUS
<b>Jaguar <i>Panthera onca</i></b> There is <b>final</b> critical habitat for this species. The location of the critical habitat is not available. Species profile: <a href="https://ecos.fws.gov/ecp/species/3944">https://ecos.fws.gov/ecp/species/3944</a>	Endangered
<b>Ocelot <i>Leopardus (=Felis) pardalis</i></b> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/4474">https://ecos.fws.gov/ecp/species/4474</a>	Endangered
<b>Sonoran Pronghorn <i>Antilocapra americana sonoriensis</i></b> Population: U.S.A. (AZ), Mexico No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/4750">https://ecos.fws.gov/ecp/species/4750</a>	Experimental Population, Non- Essential

## Birds

NAME	STATUS
<b>California Least Tern <i>Sterna antillarum browni</i></b> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/8104">https://ecos.fws.gov/ecp/species/8104</a>	Endangered
<b>Yellow-billed Cuckoo <i>Coccyzus americanus</i></b> Population: Western U.S. DPS There is <b>final</b> critical habitat for this species. The location of the critical habitat is not available. Species profile: <a href="https://ecos.fws.gov/ecp/species/3911">https://ecos.fws.gov/ecp/species/3911</a>	Threatened

## Reptiles

NAME	STATUS
Northern Mexican Gartersnake <i>Thamnophis eques megalops</i> There is <b>final</b> critical habitat for this species. The location of the critical habitat is not available. Species profile: <a href="https://ecos.fws.gov/ecp/species/7655">https://ecos.fws.gov/ecp/species/7655</a>	Threatened
Sonoyta Mud Turtle <i>Kinosternon sonoriense longifemorale</i> There is <b>final</b> critical habitat for this species. The location of the critical habitat is not available. Species profile: <a href="https://ecos.fws.gov/ecp/species/7276">https://ecos.fws.gov/ecp/species/7276</a>	Endangered

## Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9743">https://ecos.fws.gov/ecp/species/9743</a>	Candidate

## Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

## **USFWS National Wildlife Refuge Lands And Fish Hatcheries**

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

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## Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

- 
1. The [Migratory Birds Treaty Act](#) of 1918.
  2. The [Bald and Golden Eagle Protection Act](#) of 1940.
  3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
<b>Bendire's Thrasher <i>Toxostoma bendirei</i></b> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9435">https://ecos.fws.gov/ecp/species/9435</a>	Breeds Mar 15 to Jul 31
<b>Costa's Hummingbird <i>Calypte costae</i></b> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA <a href="https://ecos.fws.gov/ecp/species/9470">https://ecos.fws.gov/ecp/species/9470</a>	Breeds Jan 15 to Jun 10

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NAME	BREEDING SEASON
<b>Gila Woodpecker <i>Melanerpes uropygialis</i></b> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA <a href="https://ecos.fws.gov/ecp/species/5960">https://ecos.fws.gov/ecp/species/5960</a>	Breeds Apr 1 to Aug 31
<b>Lawrence's Goldfinch <i>Carduelis lawrencei</i></b> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9464">https://ecos.fws.gov/ecp/species/9464</a>	Breeds Mar 20 to Sep 20
<b>Long-eared Owl <i>asio otus</i></b> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/3631">https://ecos.fws.gov/ecp/species/3631</a>	Breeds Mar 1 to Jul 15

## Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

### Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is  $0.25/0.25 = 1$ ; at week 20 it is  $0.05/0.25 = 0.2$ .
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

**Breeding Season (■)**

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

**Survey Effort (|)**

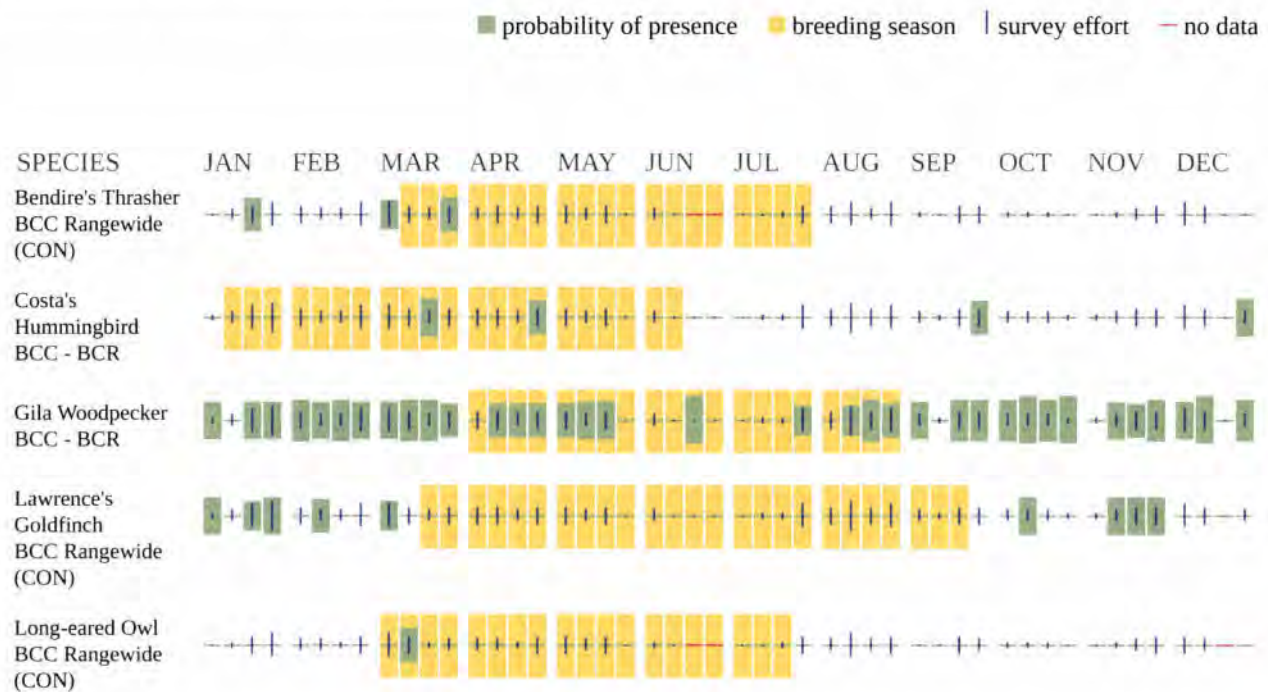
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

**No Data (—)**

A week is marked as having no data if there were no survey events for that week.

**Survey Timeframe**

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>

- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

## Migratory Birds FAQ

**Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

**What does IPaC use to generate the migratory birds potentially occurring in my specified location?**

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

**What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?**

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

**How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?**

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab](#)

of [Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

### **What are the levels of concern for migratory birds?**

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

### **Details about birds that are potentially affected by offshore projects**

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

### **What if I have eagles on my list?**

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

### **Proper Interpretation and Use of Your Migratory Bird Report**

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be

aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

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## Wetlands

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

### RIVERINE

- [R2UBH](#)
- [R4SBC](#)
- [R2USC](#)
- [R5UBFx](#)

### FRESHWATER POND

- [PUBF](#)

## **IPaC User Contact Information**

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## EXHIBIT D – BIOLOGICAL RESOURCES

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As stated in the Arizona Administrative Code R14-3-219, Exhibit 1:

*Exhibit D:*

*List the fish, wildlife, plant life and associated forms of life in the vicinity of the proposed site or route and describe the effects, if any, the proposed facilities will have thereon.*

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### OVERVIEW

The Study Area is generally defined as all areas within a two-mile buffer of the Project's features as identified in this application (**Exhibit C-1— Biological Resources**). The Proposed Route includes all areas where ground disturbance associated with the Project may occur.

### METHODS

On March 14, 2022, WestLand Resources, Inc. (WestLand) requested an automated database query report of the Arizona Game and Fish Department (AGFD) Heritage Data Management System (HDMS) using the Arizona Environmental Online Review Tool Report (**Attachment C-1**). The HDMS query returned species with Endangered Species Act (ESA) protections or that are proposed or candidates, AGFD Species of Greatest Conservation Need (SGCN), and AGFD species of economic and recreation importance (special-status species) that may be present within three miles of the Proposed Route, so the HDMS results include an additional mile outside the Study Area. Therefore, the HDMS query may result in the inclusion of habitat types and species that are not present where Project direct impacts will occur. The U.S. Fish and Wildlife Service (USFWS) maintains the Information for Planning and Conservation (IPaC), an online database that generates ESA-listed species and their critical habitat that may be present in an area subject to a query. The IPaC query results for the Study Area are attached to this document (**Attachment C-2**).

### Special-Status Species

**Tables D-1 through D-5** provide summary information, including notes on whether each species may be present in the Study Area.

While most of the Proposed Route has been previously disturbed for agricultural, commercial, residential, and industrial development, undisturbed native vegetation remains on the Tortolita Mountains alluvial fan at the eastern end and near the western end of the Proposed Route along the Santa Cruz River and immediately before the terminus of the line. Some native plant species may be present in disturbed areas, but native plant communities are absent. Some of the special-status species are dependent on native vegetation and habitat and are not likely to be present specifically along the Proposed Route. However, some species, such as bats, raptors, and migratory birds, can live or forage in modified habitats such as that along the Proposed Route and those species with the ability to fly could pass through the area while traveling to preferred habitats. Tables D-1 through D-5 below address the potential for these species to be present.

The discussions of species and potential impacts of the Project addresses species with similar habitat uses or types of impacts collectively wherever appropriate.

Determinations in Tables D-1 through D-5 regarding the potential presence of a species in the Study Area are based on database queries and desktop review of the habitat and species distribution or records of occurrence from the following sources:

- Non-game and Endangered Wildlife (AGFD 2022)
- The Cornell Lab – All About Birds and eBird (Cornell Lab of Ornithology © 2022)
- A Guide to the Amphibians and Reptiles of California (Nafis 2022)
- USFWS Online Resources and Species Profiles (USFWS 2022)

## INVENTORY RESULTS

### Physical Setting

The Study Area is in the Sonoran Desert at the northern end of the Avra Valley landform on a broad, nearly level surface. The Tortolita Mountains are approximately three miles to the east. Other mountains and hills are more than six miles distant, including the Tucson Mountains to the south, the Samaniego Hills to the northwest, and the Silverbell Mountains to the west. The Santa Cruz River crosses the western portion of the Study Area on a northwest trajectory and Interstate 10 crosses the eastern portion of the Study Area roughly parallel to the Santa Cruz River. The area between I-10 and the western terminus of the Proposed Route is almost entirely agricultural field with some residences, except for the Santa Cruz River floodplain. The Santa Cruz River is effluent-dependent perennial where it crosses the Proposed Route, fed by Tucson-area sewage treatment facilities.

The Sonoran Desert experiences winter storms from the Pacific Ocean often providing widespread regional rainfall and a midsummer monsoon season bringing tropical moisture into the region, also known as a bimodal precipitation pattern. Rainfall in the summer monsoon season is typically provided by isolated, but potentially strong, thunderstorms. These thunderstorms can be extremely variable, seasonally depending on the strength and duration of the overall monsoon weather pattern, and locally depending on the occurrence of individual thunderstorms. Rainfall generally increases with elevation. The Study Area is at a relatively low elevation, between 1,900 and 2,100 feet. Average annual precipitation in the Marana area is approximately 10 inches per year (Climate-Data.Org 2022).

### Vegetation

The Sonoran Desertscrub biotic community, as described by Turner and Brown (1994) and mapped by Brown and Lowe (1980), is divided in two major subdivisions: the Arizona Upland and the Lower Colorado River Valley. The mapped boundary of these two subdivisions passes through the Study Area (Exhibit C-1 – Biological Resources).

The Lower Colorado River Valley subdivision is typical of lower elevations and valley bottoms and includes all except the eastern mile or so of the Study Area. The dominant plant species of this subdivision is typically creosotebush (*Larrea tridentata*), often nearly in a monoculture. Cacti are relatively uncommon, although some saguaros (*Carnegiea gigantea*) and other cacti may be more common near the lower slopes

of mountain ranges. Creosotebush and other upland plants are replaced by saltbush (*Atriplex* spp.) and other plant species adapted to higher soil salinity on the lowest slopes and level areas in or near river floodplains.

The Arizona Upland subdivision is typical of rocky slopes and moderate elevations. This has the more diverse vegetation of the two Sonoran Desertscrub subdivisions, dominated by numerous leguminous desert tree species and a variety of shrubs and cacti, including saguaro. An Arizona Upland vegetation community comprising mainly native plant species is found on the Tortolita Mountains alluvial fan, primarily east of the Central Arizona Project (CAP) Canal. In the vicinity of the Proposed Route, this community includes foothill palo verde (*Parkinsonia microphylla*), blue palo verde (*P. florida*), velvet mesquite (*Prosopis velutina*), and desert ironwood (*Olneya tesota*) trees, shrubs including creosotebush (*Larrea tridentata*), whitethorn acacia (*Vachellia constricta*), triangle-leaf bursage (*Ambrosia tridentata*), cheesebush (*A. salsola*), desert hackberry (*Celtis spinosa*), and wolfberry (*Lycium* spp.), and cacti including saguaro, fishhook barrel (*Ferocactus wislizeni*), cholla (*Cylindropuntia* spp.), prickly pear (*Opuntia* spp.), and hedgehog (*Echinocereus* sp.).

Much of the Study Area has been subjected to human disturbance and has been converted to non-native vegetation types. The Proposed Route crosses a highly modified landscape of mainly agricultural fields with some residential development, including existing utility infrastructure. Scattered native plants that are tolerant of disturbance are present along field margins, roads, and in fallow fields, but native vegetation communities are absent in the agricultural areas.

The riparian vegetation community lining the Santa Cruz River crossing is on the scale of 100 feet wide on either bank of the river, but the span from outside edge to outside edge of the riparian vegetation corridor is approximately 400 feet wide on the north side of the Marana Road bridge and 700 feet wide on the south side, where additional lower floodplain terrace width generally accounts for the additional width. The riparian vegetation at the crossing includes mature riparian trees, but non-native salt cedar (*Tamarix* spp.) is a common component of the trees present, with willow (*Salix* sp.), velvet mesquite, blue palo verde, and Mexican palo verde (*Parkinsonia aculeata*) also present. Extending beyond the Santa Cruz River crossing to the west is an additional 1,000 feet of transmission line that crosses Lower Colorado River Subdivision vegetation type. Vegetation along this line segment is nearly a monoculture of creosotebush.

### **Wildlife Species**

This section discusses wildlife species that may be present in the Study Area. As noted above, the Proposed Route crosses area largely converted to agricultural uses and compared to native vegetation communities is likely to support a relatively low diversity and low numbers of wildlife. Some mobile or disturbance-tolerant or -adapted wildlife species may occur throughout the Study Area, but the number of species present in any location or at any one time would be a small proportion of the species discussed below. There are limited areas with relatively intact native vegetation communities in the Proposed Route. These areas are likely to have higher numbers and diversity of wildlife and can be the source of individuals wandering into the more impacted areas.

### **Mammals**

High mammal diversity, including bats and small rodents, inhabit parts of the Sonoran Desert. Many large and small mammal species are not tolerant of highly modified landscapes and cannot persist in areas subject

to tilling and ground disturbance. Some disturbance-tolerant small mammals can be very abundant in farmland with crops providing abundant food, using canal banks and road margins for burrow construction. Species such as coyotes (*Canis latrans*) and some raptors can become tolerant of human activities and will prey on small mammals in agricultural areas. Some bats can use ornamental trees, old buildings, and other anthropogenic features such as bridges as roost sites. Bats may also roost outside of developed areas but travel miles to forage on the high numbers of insects associated with farmland. Surface water associated with human activity is also an important resource for bats and small mammals in arid regions. The Study Area includes the CAP Canal and the Santa Cruz River, which are likely to provide food resources and water for bats and other mammals. As noted above, the more intact vegetation communities are likely to support higher numbers of individuals and diversity of species and may be a source for individuals to wander into more highly impacted areas. **Table D-1** lists mammal species that may be present in the Study Area.

### **Birds**

Birds are highly mobile and many species uncommon in the Study Area or that prefer the native desert environment may still be observed in the urban and agricultural landscapes in the Study Area. Some of the birds present may be year-round Sonoran Desert residents or are migratory, wintering in the Study Area, passing through during migration, or migrating to winter elsewhere following nesting.

There is the likelihood of raptor species to be present in the Study Area due to the availability of rodent and bird prey around fields. Agricultural landscapes also provide suitable wintering and foraging habitat for some wading birds, shorebirds, and grassland species that prefer sparse vegetation, shallow water, and other characteristics of farmed areas. As noted above, the more intact vegetation communities are likely to support higher numbers of individuals and diversity of species and may be a source for individuals to wander into more highly impacted areas. **Table D-2** lists bird species that may be present in the Study Area, focused on species that occur somewhat regularly or have ranges and documented sightings.

### **Reptiles**

Many reptiles have a low likelihood of occurring in much of the Study Area, in particular along most of the Proposed Route, because they are not tolerant of land disturbance and agricultural activities, despite the Sonoran Desert having a very high diversity of these animals. However, some reptile species can persist in modified environments, preying on rodents and insect pests associated with farmland. As noted above, the more intact vegetation communities are likely to support higher numbers of individuals and diversity of species and may be a source for individuals to wander into more highly impacted areas. **Table D-3** lists reptile species that may be present in the Study Area.

### **Amphibians**

Two species of toads are the only native amphibians identified in the HDMS likely to be present in the Study Area. Toads in the Sonoran Desert typically depend on summer rainfall and reproduce rapidly in temporary pools that are formed. Some of these species can also use manmade bodies of water and may occur in agricultural areas. As noted above, the more intact vegetation communities are likely to support higher numbers of individuals and diversity of species and may be a source for individuals to wander into more highly impacted areas. **Table D-4** lists amphibian species that may occur in the Study Area.

## **Fish**

Although the Santa Cruz River in the Study Area is perennial due to effluent discharges, the HDMS does not include records of any fish species within three miles of the Proposed Route or predicted presence based on modeling.

## **Insects**

One native insect is likely to be present in the Study Area during its migration period (**Table D-5**).

## **IMPACT ASSESSMENT RESULTS**

### **Potential Impacts on Vegetation**

Some impacts on vegetation are anticipated due to construction of the Project. On the Tortolita Mountains alluvial fan, some native Arizona Upland vegetation will be impacted for construction of transmission structure and possibly a limited amount for access road improvements for approximately 0.9 mile, although the Proposed Route follows an existing dirt road through that area. Some vegetation will be impacted along the Santa Cruz River corridor for approximately 3,600 feet, although transmission structures are not expected to impact the riverside riparian vegetation. Stringing conductor may require clearing some vegetation and any trees that could prevent a fire hazard will need to be trimmed or removed. The short segment of the Proposed Route crossing creosotebush flats in the Lower Colorado River Subdivision vegetation class at the western end will require clearing for the access road and one or two transmission structures. The rest of the Proposed Route is on disturbed lands, mainly agricultural fields.

### **Potential Impacts on Mammals**

Occurrence of mammals within the Proposed Route is likely to be low due to disturbance on most of the area. Small terrestrial mammals are likely to avoid construction activities due to ground disturbance that threatens these animals. Active and diurnal mammal species are likely to avoid construction activities, fleeing from work areas during construction. Burrowing species may be able to escape direct impact, but they could potentially get trapped in the burrow system and burrows may be impacted. The minimal loss of cultivated and fallow fields, field margins, and even lesser impacts to native vegetation along the Proposed Route, and the short duration of human activities during construction, are not likely to be important to the maintenance of local population levels for any of these species, and loss of this type of habitat is not likely to have a detectable effect on any of these species.

Since work will occur on an urban developed landscape during daylight hours, impacts on bats are not anticipated. Bats are likely to forage in agricultural areas and the Santa Cruz River during dark and dusk outside of working hours. No natural or anthropogenic features that provide habitat for nesting and roosting for bats will be impacted by the Project, except potentially minor loss of a narrow band of trees along the edge of the Santa Cruz River, where other trees upstream and downstream will not be impacted.

### **Potential Impacts on Birds**

Transmission lines can pose a collision risk to birds, including raptor species (Avian Power Line Interaction Committee [APLIC] 2012). Factors that influence whether birds are likely to collide with a specific

transmission line depend on whether there is co-location of multiple transmission lines and placement near other infrastructure so that the collective infrastructure is likely to be perceived by birds and avoided. Birds also often attempt to fly above transmission lines and other obstacles, decreasing the risk of collision. The Project is not likely to contribute to an increase in bird mortality or injury resulting from collisions along the Proposed Route.

Electrical transmission and distribution lines can also cause bird electrocution, although the risk is highest with lower-voltage lines. Electrocution occurs when a bird simultaneously contacts energized and grounded electrical components. High-voltage lines require spacing between those components that cannot be spanned even by very large birds, so that electrocution risk is precluded almost entirely (APLIC 2006).

Nesting of most native bird species is expected to be low in the Survey Area due to urbanization and lack of native habitat. However, burrowing owls can nest in burrows and cavities found in fallow farmland, field margins, and canal banks. Because burrowing owls may in some cases retreat underground when alarmed, rather than flying, and their nests are underground, they are at risk of harm from ground-disturbing activities resulting from construction of the Project. Burrowing owls could occur nearly anywhere in the Proposed Route, although their presence cannot be confirmed without conducting a preconstruction burrowing owl survey.

Some native birds regularly forage in farmland such as those present in the Study Area, although minimal loss of farmland will occur because of construction of the Project and substantial farmland is present elsewhere throughout the Survey Area and surrounding areas. Although some ground disturbance and vegetation removal would occur due to the Project, this is not likely to have a detectable effect on any bird species. This effect could be further reduced with a survey for nesting birds conducted prior to vegetation removal and ground disturbance during sensitive reproductive periods.

#### **Potential Impacts on Reptiles**

Potential impacts on reptiles would be the same as those described for mammals and would be related to the risk of harm during ground-disturbing activities. Very few reptiles are likely to be present along the Proposed Route and impacts on these species are expected to be minimal due to the fragmented urban habitat and low likelihood of occurrence.

#### **Potential Impacts on Amphibians**

Potential impacts on amphibians would be the same as those described for mammals and would be related to the risk of harm during ground-disturbing activities. Very few amphibians are likely to be present along the Proposed Route.

#### **Potential Impacts on Fish**

The Santa Cruz River has effluent-fed permanent flows along the Proposed Route, but there are no records of fish occurrence within three miles of the Proposed Route. Even if fish were present, no construction activities will occur in the Santa Cruz River and fish would not be affected. The irrigation canals do not always convey water and are not expected to support fish. The CAP Canal could potentially support fish. However, even if fish are present in either of these features, as with the Santa Cruz River, these features will not be impacted. Therefore, the Project would have no impact on fish or their habitat.

## MITIGATION MEASURES

Because the Project would be constructed mainly in areas subject to previous disturbance, outside of disturbed areas that provide essential habitat for rare or endangered species, impacts on most species present in the region would not occur or would not rise to a level that would warrant mitigation. The areas that would experience new disturbance are minimal, restricted mainly to construction of transmission structures. The following measures address the risk that electrical infrastructure and ground disturbing activities poses to wildlife:

- Transmission structures would be constructed in compliance with standards provided by the APLIC (2006, 2012). When these standards are used, the risk of electrocution and collisions for birds, including large birds and all special-status species in the Study Area, is essentially eliminated.
- Preconstruction surveys for burrowing owls would be conducted at disturbance sites in appropriate habitat by qualified biologists, according to protocols currently accepted by the AGFD. Surveys would be conducted at the appropriate time to allow for addressing active burrows without delaying construction. That timing can vary depending on the season. Burrows occupied by burrowing owls would be avoided if feasible. If any burrowing owl relocation is necessary, this would be performed by a licensed wildlife rehabilitator.
- If construction occurs during the peak nesting bird season (March 1 – August 31), a migratory bird and raptor nest survey would be performed prior to any vegetation removal or ground disturbance to avoid impacts on nesting migratory birds and raptors. Should active nests be found, the nest would be protected by an appropriately sized buffer and avoided until young birds fledge.
- Survey for Sonoran desert tortoise and Gila monster would be conducted in appropriate habitat by qualified biologists immediately prior to disturbance, using protocols accepted by AGFD. Burrows occupied by Sonoran desert tortoises would be avoided if feasible. If any Sonoran desert tortoise relocation is necessary, this would be performed by a licensed biologist.
- Impacts to native plants will be minimal due to the previously disturbed nature of most of the Proposed Route, reducing potential impacts to special-status species. The three areas where vegetation communities will be most impacted are on the Tortolita Mountains alluvial fan, primarily east of the CAP Canal, west at the Santa Cruz River crossing, and at the westernmost 1,000 feet of the route. Due to the presence of existing roads, disturbance for access roads in those areas is expected to be minimal and disturbance for transmission structure construction will avoid native vegetation to the extent practicable. On the Tortolita Mountains alluvial fan on ASLD lands, ASLD will be compensated for protected native plants that will be disturbed for support structure construction. At the Santa Cruz River crossing, the riparian vegetation along the edge of the river will not be impacted by transmission structure construction, but some removal of trees and other vegetation may be necessary within the narrow conductor line corridor for stringing of conductor and to remove fire hazard directly under the conductor, if taller trees are present.

- Crossing the Santa Cruz River will require crossing Pima County Regional Flood Control District parcels that were acquired under their Floodprone Land Acquisition Program (FLAP) lands, and Pima County Conservation Lands System (CLS) lands. Construction will need to be in compliance with any FLAP and CLS restrictions on disturbance, which will further ensure minimal resource impacts at the Santa Cruz River and potentially provide additional protections to special-status species.

## CONCLUSIONS

The Project is not likely to contribute significantly to the loss of native vegetation that provides wildlife habitat or cause declines in any native plant or wildlife species because the Project would occur mainly in an area previously, highly disturbed by agricultural and urban development. The risk that electrical infrastructure poses to birds would be addressed by following standard guidelines as design features for the Project, and preconstruction surveys for the burrowing owl, migratory birds, raptors, Sonoran desert tortoises, and Gila monsters would address potential impacts on these species.

**Table D-1: Mammal Species that are Projected to Occur in the Study Area  
Area Based on AGFD Habitat Area**

<i>Scientific Name</i>	<i>Common Name</i>
<i>Ammospermophilus harrisii</i>	Harris' antelope squirrel
<i>Corynorhinus townsendii pallescens</i>	Pale Townsend's bigeared bat
<i>Dipodomys spectabilis</i>	Banner-tailed kangaroo rat
<i>Euderma maculatum</i>	Spotted bat
<i>Eumops perotis californicus</i>	Greater western bonneted bat
<i>Eumops underwoodi</i>	Underwood's bonneted bat
<i>Lasiurus blossevillii</i>	Western red bat
<i>Lasiurus xanthinus</i>	Western yellow bat
<i>Leopardus pardalis</i>	Ocelot
<i>Leptonycteris yerbabuenae</i>	Lesser long-nosed bat
<i>Lepus alleni</i>	Antelope jackrabbit
<i>Macrotus californicus</i>	California leaf-nosed bat
<i>Myotis velifer</i>	Cave myotis
<i>Myotis yumanensis</i>	Yuma myotis
<i>Nyctinomops femorosaccus</i>	Pocketed free-tailed bat
<i>Odocoileus hemionus</i>	Mule deer
<i>Panthera onca</i>	Jaguar
<i>Pecari tajacu</i>	Javelina
<i>Perognathus longimembris</i>	Little pocket mouse
<i>Puma concolor</i>	Mountain lion
<i>Sigmodon ochrognathus</i>	Yellow-nosed cotton rat
<i>Tadarida brasiliensis</i>	Brazilian free-tailed bat
<i>Vulpes macrotis</i>	Kit fox

**Table D-2: Bird Species that are Projected to Occur in the Study Area  
Based on AGFD Habitat Modeling**

<i>Scientific Name</i>	<i>Common Name</i>
<i>Aix sponsa</i>	Wood duck
<i>Anthus spragueii</i>	Sprague's pipit
<i>Athene cunicularia hypugaea</i>	Western burrowing owl <sup>2</sup>
<i>Botaurus lentiginosus</i>	American bittern
<i>Buteo regalis</i>	Ferruginous hawk
<i>Buteo swainsoni</i>	Swainson's hawk
<i>Callipepla gambellii</i>	Gambel's quail
<i>Calypte costae</i>	Coasta's hummingbird
<i>Cistothorus palustris</i>	Marsh wren
<i>Coccyzus americanus</i>	Yellow-billed cuckoo (Western DPS)
<i>Colaptes chrysoides</i>	Gilded flicker
<i>Empidonax traillii extimus</i>	Southwestern willow flycatcher
<i>Empidonax wrightii</i>	Gray flycatcher
<i>Falco peregrinus anatum</i>	American peregrine falcon <sup>2</sup>
<i>Glaucidium brasilianum cactorum</i>	Cactus ferruginous pygmy-owl
<i>Haliaeetus leucocephalus</i>	Bald eagle (Sonoran Desert population)
<i>Melanerpes uropygialis</i>	Gila woodpecker
<i>Melospiza lincolni</i>	Lincoln's sparrow
<i>Melospiza aberti</i>	Abert's towhee
<i>Micrathene whitneyi</i>	Elf owl
<i>Myiarchus tyrannulus</i>	Brown-crested flycatcher
<i>Oreoscoptes montanus</i>	Sage thrasher
<i>Oreothylupis luciae</i>	Lucy's warbler
<i>Passerculus sandwichensis</i>	Savannah sparrow
<i>Peucaea carpalis</i>	Rufous-winged sparrow
<i>Progne subis hesperia</i>	Desert purple martin

**Table D-2: Bird Species that are Projected to Occur in the Study Area  
Based on AGFD Habitat Modeling**

<i>Scientific Name</i>	<i>Common Name</i>
<i>Setophaga petechia</i>	Yellow warbler
<i>Sturnella magna</i>	Eastern meadowlark
<i>Toxostoma lecontei</i>	LeConte's thrasher
<i>Troglodytes pacificus</i>	Pacific wren
<i>Vireo bellii arizonae</i>	Arizona Bell's vireo
<i>Zenaida asiatica</i>	White-winged dove
<i>Zenaida macroura</i>	Mourning dove

**Table D-3: Reptile Species that are Projected to Occur in the Study Area  
Area Based on AGFD Habitat Modeling**

<i>Scientific Name</i>	<i>Common Name</i>
<i>Chilomeniscus stramineus</i>	Variable sandsnake
<i>Chionactis annulata</i>	Resplendent shovel-nosed snake
<i>Coluber bilineatus</i>	Sonoran whipsnake
<i>Crotalus tigris</i>	Tiger rattlesnake
<i>Crotaphytus nebrius</i>	Sonoran collared lizard
<i>Gopherus morafkai</i>	Sonoran desert tortoise <sup>1</sup>
<i>Heloderma suspectum</i>	Gila monster
<i>Kinosternon sonoriense sonoriense</i>	Desert mud turtle
<i>Micruroides euryxanthus</i>	Sonoran coralsnake
<i>Phrynosoma goodei</i>	Goode's horned lizard
<i>Phrynosoma solare</i>	Regal horned lizard
<i>Phyllorhynchus browni</i>	Saddled leaf-nosed snake

**Table D-4: Amphibian Species that are Projected to Occur in the Study Area  
Area Based on AGFD Habitat Modeling**

<i>Scientific Name</i>	<i>Common Name</i>
<i>Anaxyrus retiformis</i>	Sonoran green toad
<i>Incilius alvarius</i>	Sonoran desert toad

**Table D-5: Invertebrate Species that are Projected to Occur in the Study Area  
Area Based on AGFD Habitat Modeling**

<i>Scientific Name</i>	<i>Common Name</i>
<i>Danaus plexippus</i>	Monarch butterfly

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

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As stated in the Arizona Administrative Code R14-3-219, Exhibit 1:

*Exhibit E:*

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

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### **SCENIC AREAS AND VISUAL RESOURCES**

#### **OVERVIEW**

Landscapes in the Project area are within a region known as the Basin and Range physiographic province, which is distinguished by isolated, roughly parallel, north-south trending mountain ranges. The Project area is relatively flat and is generally situated between the Central Arizona Project Canal on the east and the Santa Cruz River corridor on the west. The Project area is predominantly undeveloped desert lands to the east and agricultural land on the west. There is a range of developed lands dispersed throughout the Project area consisting of residential, recreation, commercial, light industrial, industrial. The Project area also includes several major highway (e.g., Interstate 10) and roadway corridors (e.g., West Marana Road and West Trico Marana Road), a Burlington Northern Santa Fe railroad, irrigation canals, transmission lines, and gas pipelines.

Notable development in the area includes the San Lucas Community, east of Interstate 10 along West Cochise Canyon Trail and Marana Towne Center/Main Street commercial developments, west of Interstate 10 along West Marana Road. These two areas, along with Interstate 10, represent the highest level of use in the Project area.

Future approved residential and commercial development is expected east of Interstate 10 with the Villages of Tortolita specific plan and west of Interstate 10 with the Sanders Grove specific plan.

There are currently open panoramic viewing conditions throughout much of the Project area, with some areas of development and Interstate 10 restricting views in localized areas. As development occurs in the future according to the Make Marana 2040 General Plan, there will be additional facilities disrupting the open viewing conditions in the Project area and creating fewer distant viewing conditions.

#### **INVENTORY METHODS**

This visual resource study focused on evaluating the existing and future landscape setting, including the potential for adverse impacts to occur on scenic quality and sensitive viewers resulting from the construction, operation, maintenance, and long-term presence of the proposed facilities. The methodology for the inventory and assessment was derived from the Bureau of Land Management (“BLM”) Visual

Resource Inventory and Contrast Rating System (8400 Series Manual-BLM, January 1986), as well as experience with past visual resource studies conducted for similar projects in the region.

## **INVENTORY RESULTS**

### **Visual Sphere of Influence**

The Project area in which the proposed facilities may result in adverse impacts on landscape scenic quality and/or sensitive viewers is defined as the Visual Sphere of Influence ("VSOI"). The VSOI for this project is more specifically defined as an area within 2 miles of either side of the proposed centerline of the Proposed Route. The 2-mile distance threshold was established, since it represents a reasonable distance where Proposed Route could result in impacts on viewers in a relatively flat, open panoramic landscape setting.

### **Landscape Character**

The Project area is located in Marana, Arizona on the northwestern side of the Tucson metropolitan area in Pima County. Most of the natural landscape setting can be characterized as relatively flat, open agricultural and desert plains dissected by ephemeral drainages. Major watercourses within the Project area include the Santa Cruz River, which dissects the western portion of the Project area in a southeast to northwest alignment. The flat desert basins allow for expansive views of nearby mountain ranges, including the distant Tortolita Mountains to the east. These distant ranges enhance the visual diversity and interest by adding distinctive form, line, color, and texture features within the relatively flat landscape setting. Interspersed throughout the region are small to mid-sized farms and agricultural lands, which further enhance the open nature of the Project area.

Native vegetation within the Project area is characteristic of typical Sonoran Desert vegetation. The prominent vegetation community occurring in large areas east of Interstate 10 can be characterized as southwestern desertscrub interspersed with more unique vegetation such as trees and cacti. The vegetative pallet is composed of numerous species of trees (e.g., foothill paloverde, ironwood, saguaro, mesquite), cacti (e.g., barrel, cholla, prickly pear), creosote bush, brittlebush, and scrub grasses with some riparian areas containing denser and more diverse vegetation (e.g., foothill paloverde and ironwood). The crops associated with the agricultural lands also enhance the setting by adding color and texture patterns. Crops include small grains, cotton, flowers, alfalfa, and produce.

The Santa Cruz River corridor is a dominant feature in the landscape that includes perennial water flow, diverse riparian vegetation along the banks, and a river channel with steep banks and rock outcrops visible in some areas.

Existing cultural manmade modifications in the Project area include, but are not limited to, residential communities (e.g., San Lucas), rural residences (e.g., Berry Acres), commercial retail and office parks, light industrial and industrial facilities, farms and ranches, roadways (e.g., Interstate 10, West Marana Road, West Trico Marana Road, North Sanders Road, North Wentz Road, North Lockett Road, North Trico Road), irrigation canals, and pipelines. Most of the overhead infrastructure in the area consists of high-

voltage transmission lines, electric distribution lines, aboveground communication, and communication towers.

Agency consultation and review of applicable comprehensive/general plans and specific approved future plans indicate that much of the remaining open desert and agricultural land will be developed in the future. This will result in a substantial change in the existing open landscape to a more densely developed “built” suburban/urban environment. It will consist of more uniform residential, commercial, light industrial/industrial, parks, and open space areas interspersed with required infrastructure such as roads, transmission lines, street signs/lights, and flood control features.

### **Landscape Scenic Quality**

The inventory of the existing scenic quality began by classifying the area’s landscape character and inherent scenic attributes of landscapes within the VSOI. Scenic quality is determined by rating the uniqueness and diversity of interest of a particular landscape in terms of landform, vegetation, water, cultural features, and the effects of adjacent scenery. Additionally, landscape scenic quality can be affected by the presence of manmade modifications (e.g., transmission lines and industrial facilities) in the visual setting.

Based on the following criteria, the Project area was separated into four scenic quality classes to identify the relative scenic value of landscapes within the Project area. The landscapes representative of Class A are those areas containing the greatest amount of scenic diversity and visual interest, Class B landscapes have above average to average scenic diversity and interest, and Class C landscapes consist of areas with the least diversity and visual interest. Developed areas are considered a separate class where no valuation has been placed on the scenic quality of the area due to the variety of architectural styles, development patterns, and user attitudes, which define the setting. Scenic quality classes are defined as follows:

- Class A – Areas of outstanding diversity or interest; characteristic features of landform, rock, water, and vegetation are rare, distinctive, or unique in relation to the surrounding region. These areas contain considerable variety in form, line, color, and texture. Typically, public concern for preserving this landscape type is high.
- Class B – Areas of above-average to average diversity or interest providing some variety in form, line, color, and texture. The features are not considered rare in the surrounding region but provide adequate visual diversity to be considered unique. Typically, public concern for preserving this landscape type is moderate, but also may be high.
- Class C – Areas of minimal diversity or interest where representative features have limited variation in form, line, color, or texture in the context of the surrounding region. Cultural modifications (e.g., transmission lines and communication facilities) are highly noticeable given the relative flatness of the surrounding terrain. Typically, public concern for preserving this landscape type is low, but may be moderate.
- Developed – Areas composed primarily of residential, commercial, and industrial facilities or a mix of these development types. It also includes utility, railroad, and roadway corridors. These areas do not contain substantial amounts of open space, except for developed parks or recreation

sites. Typically, public concern for preserving this landscape varies based on the type of development, and ranges from high in residential areas to low in industrial settings.

The only Class A landscape in the project study area is the Santa Cruz River. The Santa Cruz River exhibits a wide array of visually appealing features including perennial water flow, diverse riparian vegetation along the banks, and a river channel with steep banks and rock outcrops visible in some areas. This diverse landscape exhibits a wide range of colors due to the diverse vegetation palette and exposed soil and rock.

A substantial portion of land within the VSOI is currently used for agricultural purposes and is of Class B landscape scenic quality. Checkerboard agricultural parcels supporting a variety of crops add to the distinctiveness of the setting and create unique elements of color and texture within the natural desert landscape. When in production, agricultural lands display brown, tan, and green colors in addition to the vibrant array of colors displayed some types of mature crops. At times when the agricultural lands are fallow, they offer minimal variation in color from the surrounding desert landscape.

In contrast, small parcels of undeveloped land and fallow agricultural land are homogeneous, with typical southwestern desert scrub vegetation or previously disturbed/graded areas offering limited visual diversity. Most of these areas can be characterized as Class C landscapes, because of their limited visual appeal.

Developed areas are common within the Project area, occurring throughout a sizable portion of the land inventoried. Developed areas can include development with appealing aesthetic quality and distinctive character including landscaping (e.g., residential neighborhoods), as well heavy industrial areas like water treatment plants and manufacturing/agricultural processing facilities, where the landscape less visually appealing.

The photographs shown on following pages illustrate the typical visual conditions that have been identified within the VSOI.



*Class A – Santa Cruz River*



*Class B – Sonoran Desert Uplands*



*Class B – Agricultural Land*



*Developed – Residential Neighborhood*



*Developed – Transmission Line Corridor*



*Developed – Interstate 10 Corridor*



*Developed – North Lockett Road Corridor*



*Developed – Burlington Northern Santa Fe Railroad Corridor*



*Developed – Utilities/Marana Substation*

## **Viewpoints and Visibility**

Sensitive viewpoints are those locations where viewers would be the most susceptible to visual impacts resulting from the introduction of the proposed facilities into their viewshed, based on their level of sensitivity. Viewer sensitivity is a measure of the degree of concern viewers would have towards change occurring in their viewshed. Levels of sensitivity were determined by evaluating the compatibility of land uses to be accepting of change within their viewshed. For example, views from a residence or park would be assigned a higher level of sensitivity than views from a commercial or industrial area. Sensitive viewpoints were identified based on review of available land data, data gathered during field reviews, public and agency input, and previous environmental studies conducted for similar projects in similar settings. In addition, future sensitive viewpoints were identified through agency consultation, as well as review of current comprehensive approved plans for those jurisdictions located within the VSOI.

The viewpoints assigned a high sensitivity level include residential areas (e.g., San Lucas, Berry Acres, rural residences) and recreational areas (e.g., CAP Trail and Juan Bautista De Anza National Historic Trail). However, the presence of intrusive modifications in a high sensitivity area may cause the area to be characterized as having lower viewer sensitivity regardless of the type of use. Moderate sensitivity viewpoints commonly include public or government buildings, and major travel routes (i.e., Interstate 10 and major arterial roads). Views from commercial/light industrial/industrial areas are considered low sensitivity.

## **Impact Assessment Methodology**

The potential impacts of the proposed facilities on visual resources within the Project area could result from a variety of project activities occurring during both construction (e.g., erection of poles, stringing conductors, clearing of substation site) and operation (e.g., presence of poles, conductors, and substation). This section discusses the methods used to assess the potential impacts the facilities would have on landscape scenic quality and sensitive viewers within the VSOI, as well as the results of the analysis. Potential visual impacts resulting from the proposed facilities range from high in areas where substantial changes would occur in the visual setting to low in areas where change would be least evident. In addition, mitigation measures that could be used to reduce impacts on the visual setting are described.

## **Project Contrast**

Impacts on landscape scenic quality and sensitive viewers were determined by evaluating the degree of contrast the proposed facilities would have in the VSOI. Project contrast is defined as a measure of the degree of perceptible change that would occur to the scenic quality or sensitive views within the VSOI. Project contrast is determined by evaluating the following three variables: (1) physical landform changes, (2) removal of vegetation, and (3) the addition of structural changes in the landscape.

Landform and vegetation contrast were not evaluated in detail for this study because the project would not require substantial grading/landform manipulation, primarily because the area is relatively flat and accessible. The project also would not require notable vegetation removal because the routes are in areas that are modified/disturbed or may be developed during or before the Proposed Route are built. Therefore, the primary component in the evaluation of project contrast was the relationship between existing and

proposed transmission line structures within the context of the surrounding environment as well as the future environment.

The introduction of new or modified structures into the existing landscape would create noticeable visual changes in the VSOI. However, these impacts would not be as noticeable when adding a transmission line to an existing corridor versus a previously unmodified setting. Constructing the proposed transmission line next to an existing transmission line with the same or similar structures would result in the lowest impact on scenic quality and sensitive viewers. Alternatively, the most substantial impacts would result from the introduction of a transmission line into an area that does not have existing lines. Additional factors that would affect the degree of contrast include the type of adjacent development. For example, transmission lines typically are less noticeable in industrial settings or in areas where other vertical features such as signs, lights, buildings, roadway intersections/interchanges, and trees dominate the setting. These variables also were included in the evaluation of project contrast.

Project contrast levels (existing and future visual conditions) were established for each of the Proposed Route evaluated, with many areas having low to moderate project contrast levels due to the presence of existing overhead transmission or distribution lines.

### **Landscape and Scenic Quality Methodology**

Impacts on scenic quality are determined by evaluating the level of change to the aesthetic qualities of landscapes within the VSOI because of the implementation of the proposed facilities. Impacts on landscape scenic quality considered existing conditions and accounted for the predicted future conditions of the VSOI. The potential for impacts on scenic quality was driven by changes in the built environment as much as by the addition of the proposed facilities. The need for the proposed transmission lines is driven by future development, which typically occurs before or during the construction of the transmission lines.

While the existing scenic quality of the landscapes within the VSOI was inventoried, an important element to consider for the evaluation of impacts is the likely future condition of the landscapes established by the review of comprehensive/general plans and approved plans relevant to the Project area. It is anticipated that most of the land on both sides of the Interstate 10 that is currently open space or used for agricultural purposes, will be developing into residential and commercial uses, and some areas of mixed use and employment. Open space will consist primarily of developed recreational areas and undeveloped desert open space east of the CAP Canal.

Impacts from the proposed facilities on scenic quality would be highest in Class A and B landscapes and parks/trails, as well as residential areas. Impacts would be lowest when the proposed facilities are in existing transmission line corridors in rural agricultural areas or commercial/industrial areas. It is anticipated that most of the impacts on landscape scenic quality would be moderate to low due primarily to avoidance of highly scenic areas and/or locating the proposed facilities in areas where there are no existing plans for development or where future plans can be developed to accommodate the Proposed Route. The scenic quality impacts resulting from the proposed facilities were established using the general criteria in the following table. It should be noted that these criteria are only guidelines and specific conditions could change impact levels.

## Viewer Impact Methodology

Impacts on sensitive viewers are directly attributable to the visibility potential or how the project would be seen from a particular viewing area. The impact assessment considered three components in establishing the degree of impact on sensitive viewers resulting from the introduction of the Proposed Route into the VSOI: (1) viewing distance (i.e., relationship of the viewer to the transmission line); (2) screening and backdropping (i.e., adjacent vegetation, terrain, and development); and (3) degree of project contrast discussed previously.

The noticeable visual change to the landscape resulting from the introduction of transmission lines depends largely on the distance of the facilities from the viewer. The contrast of transmission lines within the landscape typically decreases with increased viewing distance because the details and scale/dominance of the transmission lines are reduced. Conversely, when viewed in proximity (e.g., within 600 feet) the details and scale/dominance of the transmission lines are prominent. Although each project is unique due to several viewing variables, potential impacts on sensitive viewers were evaluated within the VSOI at the following distance zones:

- Immediate Foreground (0-600 Feet)
- Foreground (Foreground 660 - 1,320 feet)
- Middleground (1,320 - 5,280 feet)
- Background (1 mile +)

Available screening and backdropping also were considered in the assignment of impact levels. Two types of screening were identified within the Project area: (1) vegetative screening and (2) development screening (e.g., adjacent residential, commercial, and industrial areas). Topographic screening was not considered in this study due to the relatively flat terrain throughout the VSOI. The presence of vegetative or development screening could effectively lower levels of impact assigned to views from surrounding areas since visibility of the proposed facilities may be reduced or blocked. Another variable evaluated in the assignment of impact levels is consideration of backdropping from terrain (e.g., Tortolita Mountains) or development (e.g., tall light industrial buildings). The proposed facilities are absorbed to varying degrees when viewed against background terrain or development. The visual absorption capability is determined by the degree or complexity of elements and similarity in colors and textures, which make up the background.

As previously described, sensitive viewers are those most susceptible to visual impacts resulting from the introduction of the proposed facilities into their viewshed. The degree of potential impact on viewers is based on the level of viewer sensitivity combined with project visibility and contrast relative to the view. The viewer impacts resulting from the proposed facilities were established using the general criteria in the following table. It should be noted that these criteria are only guidelines and specific conditions could change impact levels.

### Impact Assessment Criteria

Table E-1 includes a summary of the criteria used to assess potential impacts on existing and future landscape scenic quality and sensitive views, for the Proposed Route.

**Table E-1 – Impact Assessment Criteria**

<b>Impact Rating</b>	<b>Criteria</b>
Low	<ul style="list-style-type: none"> <li>• Minimal potential conflicts with existing scenic quality or views, as well as views from planned land uses</li> <li>• Scenic quality Class C landscapes or Class B landscapes with adjacent existing transmission lines or industrial development, as well as industrial and commercial retail areas</li> <li>• Non-residential areas with open views to existing transmission lines, industrial areas, areas with good construction and maintenance access (e.g., roads), and previously disturbed areas such as sand and gravel mining</li> <li>• Views (moderate sensitivity) typically would be in the background or middleground distance zone where there are existing transmission lines</li> <li>• Routes would comply with visual resource planning guidelines and scenic management policies</li> </ul>
Moderate	<ul style="list-style-type: none"> <li>• Some conflicts with existing and planned visual resources</li> <li>• Scenic quality Class B landscapes with no existing transmission lines or Class A landscapes with existing transmission lines or adjacent industrial development, as well as commercial office park areas and active use recreation areas</li> <li>• Mitigation efforts can reduce visual impacts to low levels</li> <li>• Commercial areas, primary and secondary roads with no existing transmission lines, residential areas with existing transmission lines, agricultural and/or ranching uses, and undisturbed areas with minimal value in terms of scenic quality or views and that are planned for development</li> <li>• Views (high or moderate sensitivity) typically would be in the middleground distance zone or immediate foreground and foreground distance zones where there are existing transmission lines</li> </ul>
High	<ul style="list-style-type: none"> <li>• Routes conflict with existing scenic quality or high sensitivity views, as well as views from high sensitivity future land uses</li> <li>• Scenic resources may be protected by agency planning guidelines</li> <li>• Scenic quality Class A landscapes as well as residential and regional park/preserve areas</li> <li>• Mitigation efforts may reduce impacts, but not to low levels</li> <li>• Existing nearby residential or recreation areas (parks, trails, opens space) without transmission lines, planned recreation or scenic areas, areas without existing access that would require substantial soil and vegetation disturbance, and areas with utilities recently placed underground</li> <li>• Views (high sensitivity) typically would be in the immediate foreground or foreground distance zones where there are no existing transmission lines</li> </ul>

The production of visual simulations was a key component of the visual analysis conducted for the project. The visual simulations were used to verify impact levels as well as provide the public and agencies an opportunity to review the magnitude of change associated with the proposed project facilities in the VSOI.

In general, the process of creating visual simulations includes (1) photographing the project location from various viewpoints; (2) developing a three-dimensional (3-D) model of the proposed project structures; and (3) superimposing the modeled structures into the photographs. To obtain the highest quality image for simulation, photographs were taken with a high-resolution digital camera using a 50-millimeter lens. When

a single photograph could not depict the entire impact area and its immediate setting, images were spliced together to obtain a sufficient angle of view. The splicing process results in a more accurate representation of views than photos that could be acquired using a typical wide-angle lens. The 3-D digital models of proposed structures were produced by AEPCO's engineering design contractor. Using these models, 3-D perspective views of proposed project facilities and selected existing structures were generated in 3D Studio Mac, under lighting conditions selected to match those associated with the conditions when the photographs were taken. These 3-D perspective views were then superimposed onto the digital photographs, using existing terrain and structures to accurately reference and locate the proposed facilities in the image, for final scaling and rendering in Photoshop.

## **MITIGATION MEASURES**

The impact assessment considered several mitigation measures that AEPCO will include in the final project design to reduce overall project contrast and minimize potential impacts on landscape scenic quality and sensitive viewers. The effectiveness of a mitigation measure is determined by the degree to which it diminishes the visual contrast of the proposed facilities in each setting. The following mitigation measures may be implemented to reduce visual contrast resulting from the proposed facilities.

1. To avoid disturbance to sensitive features (e.g., residences, recreation areas), access roads will not be constructed in those areas unless necessary. Instead, construction and maintenance traffic will use existing roads or cross-country access routes (including right-of-way) where suitable access exists. If access roads are required, AEPCO will return the affected areas as near to their original condition as possible.
2. To minimize ground disturbance, operational conflicts, and/or visual contrast, the transmission line structure design will be a single-steel pole with a self-weathering finish to reduce surface reflection and provide a rustica appearance to enhance compatibility with the surrounding rural environment.
3. To reduce visual contrast and/or potential operational conflicts, standard structure design will be modified to correspond with spacing of existing transmission line structures where practicable and within limits of standard structure engineering design. The normal span will be modified to correspond with existing structures, when possible.
4. To reduce visual impacts, potential impacts on recreation values, and safety at highway, wash, and trail crossings, structures are to be placed at the maximum viable distance from the crossing within limits of standard structure engineering design.
5. Non-reflective (non-specular) conductors will be used for the entire length of the transmission line route.

## **Impact Assessment Results**

The following sections provide a general description of the potential impacts on landscape scenic quality and sensitive viewers for the Proposed Route. The potential impacts consider the existing and future visual conditions, as well as previously described mitigation measures incorporated into the Project description.

Impacts on future landscape settings typically would be lower than for existing landscapes because future plans can be more readily adapted to account for the presence of the Proposed Route. More specifically, impacts on the landscape setting for planned areas approved for implementation typically are higher than those associated with general planned areas because plans would need to be changed to accommodate the proposed transmission lines.

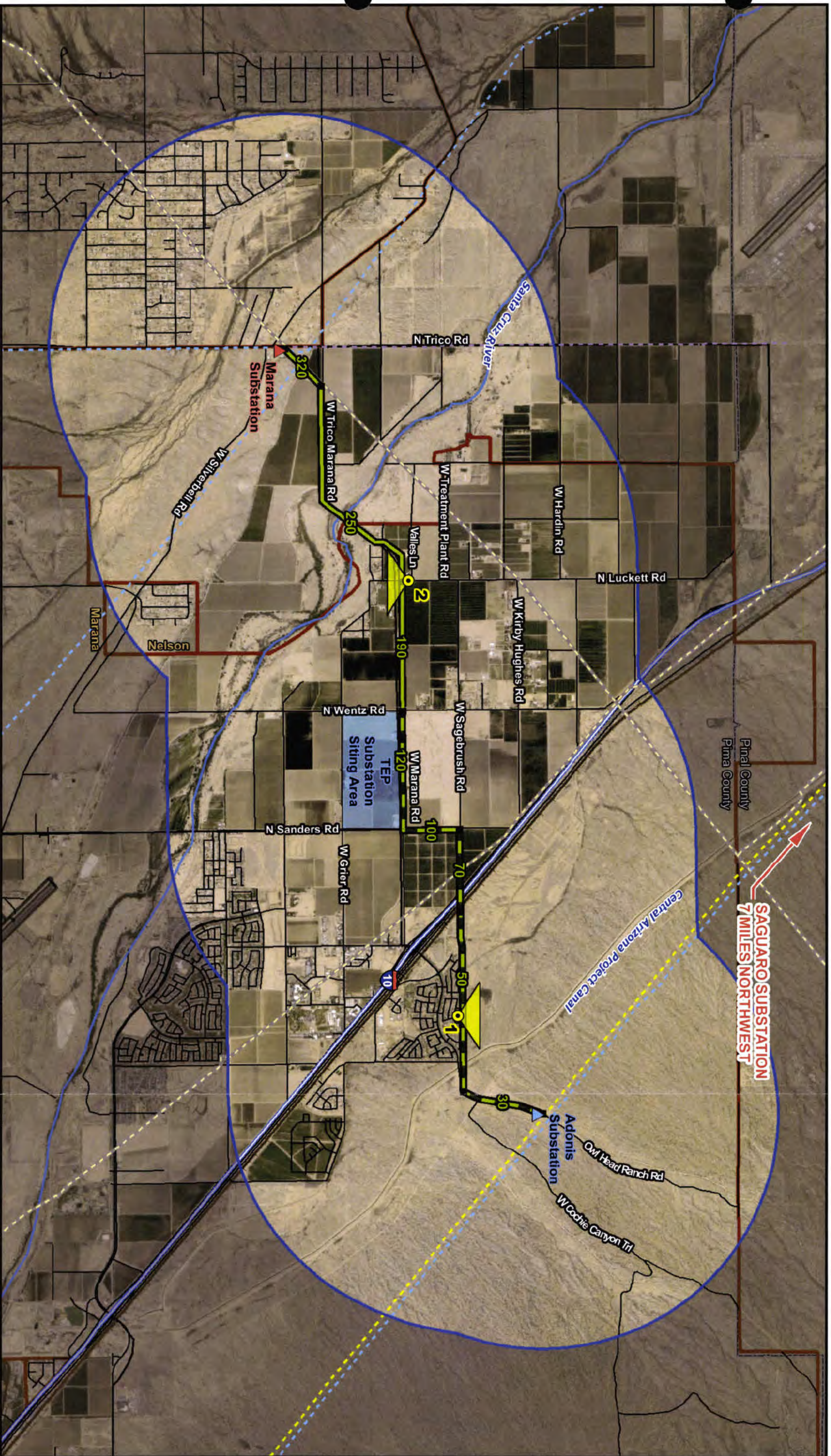
Table E-2 includes a summary of impact so existing and future landscape scenic quality and sensitive views, and relevant comments associated with the analysis of the Proposed Route and associated link segments.

**Table E-2 – Visual Resources Impact Assessment Results**

<b>Link Segment</b>	<b>Existing Visual Resources</b>	<b>Planned Visual Resources</b>
30	<ul style="list-style-type: none"> <li>• Low impacts on Class B desert uplands landscapes, where transmission line would follow existing road</li> <li>• Moderate to high impacts on open panoramic views along CAP Canal Trail</li> <li>• Low impact on views from Owl Head Ranch Road</li> </ul>	<ul style="list-style-type: none"> <li>• Low impacts on views from general planned future recreation and residential development</li> </ul>
50	<ul style="list-style-type: none"> <li>• Low impacts on Class B desert uplands landscapes, where transmission line would follow existing road and drainage channel</li> <li>• Moderate to high impacts on partially screened to open views from San Lucas Community</li> </ul>	<ul style="list-style-type: none"> <li>• Low impacts on views from general planned future residential development</li> </ul>
70	<ul style="list-style-type: none"> <li>• Low impacts on Class B agricultural landscapes, where transmission line would follow existing road</li> <li>• Low impacts on views along Interstate 10 and West Sagebrush Road</li> </ul>	<ul style="list-style-type: none"> <li>• Low impacts on views from future plan approved commercial Uptown at Marana development</li> <li>• Low to moderate impacts on views from future plan approved residential Uptown at Marana development</li> </ul>
100	<ul style="list-style-type: none"> <li>• Low impacts on Class B agricultural landscapes, where transmission line would follow existing road</li> <li>• Low impacts on views along Interstate 10 and North Sanders Road</li> </ul>	<ul style="list-style-type: none"> <li>• Low impacts on views from future plan approved commercial Uptown at Marana and Sanders Grove developments</li> <li>• Low to moderate impacts on views from future plan approved residential Uptown at Marana and Sanders Grove developments</li> </ul>
120	<ul style="list-style-type: none"> <li>• Low impacts on Class B agricultural landscapes, where transmission line would follow existing road</li> <li>• Low impacts on views along West Marana Road, where transmission line would parallel existing distribution lines</li> </ul>	<ul style="list-style-type: none"> <li>• Low impacts on views from future plan approved Sanders Grove development</li> <li>• Low to moderate impacts on views from future plan approved residential Sanders Grove development</li> </ul>

Link Segment	Existing Visual Resources	Planned Visual Resources
190	<ul style="list-style-type: none"> <li>• Low impacts on Class B agricultural landscapes, where transmission line would follow existing road</li> <li>• Moderate to high impacts on views from rural residences along West Marana Road</li> <li>• Low impacts on views along West Marana Road, where transmission line would parallel existing distribution lines</li> </ul>	<ul style="list-style-type: none"> <li>• Low impacts on views from general planned future residential development</li> </ul>
250	<ul style="list-style-type: none"> <li>• Moderate to high impacts on Class A Santa Cruz River landscapes, where transmission line would follow road and bridge</li> <li>• Low impacts on Class B agricultural landscapes, where transmission line would follow existing road</li> <li>• Moderate to high impacts on views from rural residences/Berry Acres along West Marana Road</li> <li>• Moderate to high impacts on open to partially screened views along Juan Bautista De Anza National Historic Trail</li> <li>• Low impacts on views along West Trico Marana Road, where transmission line would parallel existing distribution lines</li> </ul>	<ul style="list-style-type: none"> <li>• Low impacts on views from general planned future residential development</li> </ul>
320	<ul style="list-style-type: none"> <li>• Low impacts on Class B agricultural landscapes, where transmission line would follow existing road</li> <li>• Low impacts on Class C desert scrub and Class Developed utility landscapes</li> <li>• Low impacts on views from rural residences along North Trico Road</li> <li>• Low impacts on views along West Marana Road, where transmission line would parallel existing distribution lines</li> </ul>	<ul style="list-style-type: none"> <li>• Low impacts on views from general planned future residential development</li> </ul>

Visual simulations were completed from two viewpoints as shown on Exhibit E-1 – Visual Simulation Photo Locations. The visual simulations are intended to assist with the analysis of the visual impacts associated with the introduction of proposed project into the landscape. The visual simulations are provided as Exhibits E-2.1, Exhibit E-2.2, and Exhibit E-3 on the following pages.



**SAGUARO SUBSTATION**  
7 MILES NORTHWEST

**Reference Features**

- Study Area
- Railroad
- County Boundary
- Major Roads
- Local Road

**Utilities**

- Existing Substation
- Proposed Substation
- Existing Pipeline

**Existing Transmission Lines**

- Existing 138kV Transmission Line
- Existing 115kV Transmission Line
- Existing 24.9kV Distribution Line

**Visual Simulation**

- Locations
- Photo Location
- Visual Simulation View Direction

**Proposed Route**

- Proposed Route Single
- Proposed Route Double
- Route Link Node
- Route Link Number

Scale in Feet

1 inch = 4,000 feet (1:48,000)

When Plotted at 11x17

Arizona G&T Cooperatives

BURNS & MCDONNELL

**Exhibit E-1**

**Visual Simulation**

**Viewpoint Locations**

Saguaro - Marana 115/138kV Transmission Line Project

Arizona G&T Cooperatives



Visual Simulation #1  
San Lucas Community

Viewing North from the Cul-de-sac at North Arrowpoint Ash Avenue

Existing Condition



Proposed Condition – Open Viewing Condition



**Visual Simulation #1**  
**San Lucas Community**

Viewing North from the Cul-de-sac at North Arrowpoint Ash Avenue

**Existing Condition**



**Proposed Condition – Partially Screened Viewing Condition**

**Exhibit E2.2 – Simulation #1**



Visual Simulation #2  
Rural Residences  
Along West Marana  
Road

Viewing south/southeast from the  
North Lockett Road towards  
West Marana Road

Existing Condition



Proposed Condition – Open Viewing Condition

Table E-3 includes a summary of impacts for visual resources by Route and Link Segment for each of the Proposed Route and associated link segments.

**Table E-3 – Visual Resources Impact Assessment Route and Link Segment Summary**

<b>Proposed Route Link Segment</b>	<b>Mileage</b>	<b>Existing Visual Resources</b>			<b>Planned Visual Resources</b>		
		<b>High</b>	<b>Moderate</b>	<b>Low</b>	<b>High</b>	<b>Moderate</b>	<b>Low</b>
30	0.69	0.28	0.14	0.27	0.29	0.14	0.27
50	1.53	1.49	0.04	-	1.27	0.13	0.13
70	0.71	-	0.08	0.63	-	-	0.71
100	0.99	-	-	0.99	-	-	0.99
120	0.49	0.05	0.16	0.28	0.05	0.16	0.28
190	1.10	0.77	0.33	-	0.77	0.33	-
250	2.03	0.75	0.50	0.78	0.75	0.50	0.78
320	0.45	-	0.12	0.32	-	0.13	0.31
<b>Route Total</b>	<b>7.99</b>	<b>3.34</b>	<b>1.38</b>	<b>3.27</b>	<b>3.13</b>	<b>1.39</b>	<b>3.47</b>

Note: Tabulating mileage numbers may result in slight differences between totals due to rounding.

## CONCLUSIONS

Impacts on existing and future visual resources resulting from construction, operation, and maintenance of the Proposed Route range from low to high. Low impacts occur in areas within existing agricultural and undeveloped desert lands where the Proposed Route follows existing roads. Moderate to high impacts on existing residential views will occur where the Proposed Route would be closest to viewers. Moderate to high impacts will also occur where the Proposed Route crosses the CAP Trail and the Juan Bautista National Historic Trail where viewers would cross under the line where it intersects the trail. Moreover, these routes follow existing transmission lines and roadways extensively, which provides visually compatible areas for siting the Proposed Route. Design and mitigation measures will reduce overall visual contrast of the proposed transmission lines from most views and would prevent adverse impacts to sensitive viewers.

## REFERENCES

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## HISTORIC SITES AND STRUCTURES AND ARCHAEOLOGICAL SITES

As required by the Arizona Administrative Code R14-3-219, Ex. 1(E), the potential effects of the Project on historic sites and structures and archaeological sites were assessed. The assessment also was prepared to support Arizona Corporation Commission compliance with the State Historic Preservation Act (A.R.S. §§ 41-861 – 41-864), which requires state agencies to consider impacts of their programs on historic properties listed in or eligible for listing in the Arizona Register of Historic Places (“ARHP”), and to provide the State Historic Preservation Office (“SHPO”) an opportunity to review and comment on the actions that affect such historic properties.

### CLASS I RECORDS REVIEW METHODS

WestLand Engineering & Environmental Services (WestLand) examined information for historic sites, structures, and archaeological sites within the Study Area, defined as the Preliminary Routes plus a 1-mile buffer. The following sources were consulted:

- AZSITE database
- Archaeological Records Office of the Arizona State Museum
- Historic General Land Office (GLO) Plats
- Historic U.S. Geological Survey topographic quadrangle maps
- National Register of Historic Places
- ARHP

WestLand gathered information from these sources to evaluate whether portions of the Study Area had been previously surveyed for cultural resources, to determine whether historic properties eligible for inclusion or already listed in the Arizona or National Register of Historic Places (“A/NRHP”) are present within the Study Area, and to provide recommendations concerning the potential of the Preliminary Routes to impact cultural resources. The full Class I results for the Study Area are presented in Attachment B-2 and were considered during the selection of the Proposed Route.

This exhibit summarizes the results of the records review with particular emphasis on the Proposed Route. This documentation is intended to support the Arizona Corporation Commission in complying with the State Historic Preservation Act as it reviews the Application for a CEC for the proposed project.

### CLASS I RECORDS REVIEW RESULTS

According to the records reviewed, 105 cultural resources inventories have been conducted within the Study Area (see **Attachment B-2, Figure A.1.a–c and Table A.1**). These inventories include large block surveys such as the Northern Tucson Basin Survey and numerous linear surveys for roads, transmission lines, pipelines, and aqueducts. Only ten of the projects were conducted in the last 10 years, though additional projects conducted in the 2000s may also meet modern standards.

Within the Study Area, 185 archaeological sites have been previously recorded (see **Attachment B-2, Figure A.2.a–c and Table A.2**). Nineteen sites are associated with historical Euroamerican use of the area, 159 sites are prehistoric with most attributed to the Hohokam, five sites have prehistoric and historical components, and two sites are of unknown age and cultural affiliation.

During the records check, the ASM informed WestLand that they are currently involved in efforts to consolidate a number of the sites within the Study Area. The revised consolidated boundaries are not yet available but are likely to result in more areas being inside archaeological site boundaries, particularly along Segments 40 and 10 exiting the proposed Adonis Substation. Sites that the ASM intends to consolidate are marked in **Table A.2 of Attachment B-2**.

A file search conducted in the NRHP and the ARHP databases indicates that no sites listed on either register are located within the Study Area (National Park Service 2022; Arizona State Parks 2022).

The records review revealed that there are 11 recorded historic sites, structures, or archaeological sites which intersect or are immediately adjacent to the Proposed Route (**Table 1**).

**Table 1 – Previously recorded sites intersecting or adjacent to the Proposed Route**

Site Number (ASM)	Site Type	Age and Cultural Affiliation	NRHP Eligibility
AZ Y:3:50 (South Gila Ditch) 1	Features	Euro-American/Middle to Late Historic (1800–1950 AD)	Eligible (a)
AZ Z:2:40 (Southern Pacific Railroad Mainline - Southern Route) 2	Artifact scatter with features	Euro-American/Middle to Late Historic (1800 – 1950 AD)	Eligible (a)
AZ AA:2:118 (Historic SR 84) 3	Historic road	Euro-American/Late Historic (1900 – 1950 AD)	Eligible (d)
AZ AA:11:12 (Hog Farm Ballcourt Site) 4	Artifact scatter with features	<ul style="list-style-type: none"> <li>Hohokam/Colonial Period (750 – 950 AD) and Classic Period (1100 – 1450 AD)</li> </ul> Euro-American/Historic (1500 – 1950 AD)	Eligible (d)
AZ AA:11:240 5	Feature	Euro-American/Late Historic (1900 – 1950 AD)	Not eligible
AZ AA:12:356 6	Artifact scatter	Hohokam/Ceramic (200 – 1500 AD)	Not eligible
AZ AA:12:466 7	Artifact scatter with features	Hohokam/Ceramic (200 – 1500 AD)	Not evaluated
AZ AA:12:646 8	Artifact scatter with features	Hohokam/Ceramic, Tanque Verde phase (1100 – 1450 AD)	Eligible (d)
AZ AA:12:870 (Cortaro Farms Canal) 9	Features	Euro-American/Historic (1900 – 1950 AD)	Eligible (d)

Site Number (ASM)	Site Type	Age and Cultural Affiliation	NRHP Eligibility
AZ AA:12:1065 10	Artifact scatter with features	Hohokam/Ceramic (200 – 1500 AD)	Not eligible
AZ AA:12:1071 11	Artifact scatter	Native American/Prehistoric (12000 BC - 1500 AD)	Eligible (d)

AZ AA:11:240(ASM), AZ AA:12:356(ASM), and AZ AA:12:1065(ASM) are not eligible for listing on the A/NRHP and therefore are not considered further.

The historic map review for the full Study Area is included in **Attachment B-2**. Several features intersect the Proposed Route:

- **GLO plat for Township 11 South, Range 11 East, Gila and Salt River Meridian, Arizona, surveyed in 1895 and officially filed 1-8-1897 (see Attachment B-2, Figure 3).** The Southern Pacific Railroad is depicted as crossing Proposed Route Segment 50 at the boundary of Sections 16 and 21. The “Road from Picacho to Tucson” crosses Segment 50 at the corner of Sections 16, 17, 21, and 22. The road is a precursor to historical and modern State Route (SR) 84. An irrigating ditch is depicted as crossing Segment 50 in Section 15. Evidence of the ditch can still be seen in modern aerial photographs, but it no longer exists south of the Section 15 boundary. A road also is depicted as crossing Proposed Route Segment 30 within Section 14, however, the alignment does not correspond to existing roads in the area. Finally, a road originating from the “Road from Picacho to Tucson” is depicted as crossing Segments 100 and 130 in Sections 20 and 21. The road crosses modern agricultural fields and is no longer visible on aerial photographs.
- **GLO plat for Township 11 South, Range 10 East, Gila and Salt River Meridian, Arizona, surveyed in 1911 and officially filed 4-15-1913 (see Attachment B-2, Figure 4).** Features are depicted within the Study Area, however, none intersect the Proposed Route.
- **GLO plat for Township 11 South, Range 10 East, Gila and Salt River Meridian, Arizona, surveyed in 1911 and 1921–1922 and officially filed 9-25-1924 (see Attachment B-2 Figure 5).** A road is depicted crossing Proposed Route Segments 290 and 320 in Section 22. The road crosses modern agricultural fields and is no longer visible on aerial photographs.
- **1967 1:24,000-scale (7.5' series) Marana, Arizona, USGS quadrangle (see Attachment B-2 Figure 6).** This map depicts the existing road along Proposed Route Segment 30 in Section 14. Four two-track roads are depicted crossing Segment 50, two at the boundary of Sections 15 and 22 heading to the Borrow Pit in Section 15, and two at the boundary of Sections 16 and 21. Traces of these roads are still visible on aerial photographs. Additional farm roads are depicted in Section 21, one of which is aligned with Segment 70 along the northern boundary of Section 21. Sanders Road and Trico Marana Road are also depicted and labeled along Segments 100 and 120 in Sections 21 and 20.

## Assessment of Effects

As part of the Class I review, the Preliminary Routes were each assessed for level of impact to eligible historic structures and archaeological sites. Potential avoidance measures such as shifts in the alignment, adjustments to span distances, and rerouting of access roads were considered when assessing potential impacts.

Site density is highest in the eastern portion of the Study Area (see Attachment B-2, Figure A.2.c). AZAA:12:251(ASM), the Marana Platform Mound Community, is a large prehistoric habitation center. The dissected alluvial fan surrounding AZ AA:12:251(ASM) is a dense archaeological landscape with recorded villages, farmsteads, rock pile fields, roasting pits, and other specialized activity areas. Subsurface cultural deposits and human remains are highly likely to be encountered throughout this area. The Preliminary Route Segment 40 and to an extent Segment 10 pass through this area, intersecting a number of eligible and unevaluated sites as currently mapped. The east to west portion of Segment 40 also does not follow an existing disturbed right of way, as many other Segments do. Avoidance of sites in this area is not likely to be possible, therefore, WestLand assigned a High Impact to this Segment regarding cultural resources and recommended that Segments 40 and 10 not be included in the Proposed Route. This recommendation is consistent with the Arizona SHPO's preference for avoidance of listed, eligible, and unevaluated sites.

Eight recorded historic properties have the potential to be impacted by the Proposed Route. AZ Y:3:50(ASM), the South Gila Ditch; AZ Z:2:40(ASM), the Southern Pacific Railroad Mainline - Southern Route; AZ AA:2:118(ASM), Historic SR 84; and AZ AA:12:870(ASM), Cortaro Farms Canal, are all linear resources which the Proposed Route intersects. However, the proposed transmission line would pass above these resources, and they would not be directly affected. Visual affects to these resources are not expected to be significant. The existing built environment already includes modern infrastructure such as roads, transmission lines, and canals. The addition of the proposed transmission line to the visual landscape will not be a significant impact to the integrity of these historic properties.

AZ AA:12:466(ASM) was originally recorded in 1983 as an sherd and lithic scatter with rock piles attributed to the Hohokam (Riddle 1983). According to AZSITE, the site is considered unevaluated by the SHPO and should be treated as eligible until a recommendation can be made. The site boundary is immediately adjacent to the Proposed Route, laying just west of Segment 30. However, the Segment follows a previously disturbed ROW. The site can be avoided by utilizing the eastern side of the right-of-way in the vicinity of the site. An archaeological monitor should also be present during any ground disturbance to mitigate any potential impacts to the site should additional archaeological materials be encountered outside the site boundary.

AZ AA:12:646(ASM) was originally recorded in 1984 as a Hohokam site with a possible pit house, an ashly stain (within the possible pit house), and an artifact scatter (Madsen 1984). The site has been determined eligible by the SHPO, and human remains have been encountered during previous field work. The site boundary is intersected by Segment 50 of the Proposed Route. The majority of the site is mapped to the south of the Segment, where a residential area now exists. If possible, transmission line structures should be placed outside the site boundary and any access roads routed to avoid what may remain of the site. If

avoidance is not feasible, an archaeological monitor should be present during ground disturbance to mitigate any potential impacts to the site.

AZ AA:12:1071 was originally recorded in 2008 as a low density artifact scatter consisting of 30 sherds and two flakes eroding out of the sides of a small wash (Fergusson 2010). The site has been determined eligible by the SHPO. The site boundary is immediately adjacent to the Proposed Route, laying just east of Segment 30. If possible, the site should be avoided by designing structure locations to be outside the site boundary, and if necessary, routing any access routes around the site. If ground disturbance within the site boundary cannot be avoided, an archaeological monitor will be present during construction.

AZ AA:11:12(ASM), the Hog Farm Ballcourt Site, is an extensive artifact scatter with features that was initially recorded in 1986 (Downum et al. 1986). The site represents the remnants of an extensive prehistoric Native American settlement with a long history of occupation attributed to the Colonial through early Classic periods of the Hohokam culture. SHPO has determined the site eligible for listing on the A/NRHP. The existing AEPCO Marana Substation is located within the site boundary, therefore, the site cannot be avoided by any selected alignment. Portions of the site, including within the substation, have been subjected to a variety of archaeological testing and monitoring projects (e.g., Archer 2001; Barr 2004; Hesse 2001; Heuett 1998; Lindeman 1995; Ruble 2003). Findings in this portion of the site have been minimal, however, subsurface deposits may still exist. The line should be designed to minimize impacts by using the fewest transmission poles necessary within the site and utilizing existing roads for access wherever feasible. Further, an archaeological monitor should be present during any ground disturbance within the site.

Several previously unrecorded resources identified on historical maps still exist in the area. These should be evaluated during a Class III survey, however, they are not likely to be considered eligible for the A/NRHP.

## CONCLUSIONS

WestLand performed a cultural resources assessment to better inform the evaluation of Preliminary Routes for the Saguaro to Marana 115/138kV Transmission Line Project Study Area. To understand previous survey coverage and known archaeological site density, WestLand reviewed existing archaeological survey and site information available in the AZSITE archaeological database and at the ASM Archaeological Records Office. WestLand also examined historical maps of the Study Area to assess the potential for additional historical sites that have not yet been recorded.

Approximately 49 percent of the Study Area has been previously surveyed for cultural resources. However, less than 5 percent has been surveyed within the past 10 years. Along the Preliminary Routes, approximately 19 miles (or 65 percent of the routes) have been previously surveyed, with less than 3 miles (or 9 percent of the routes) surveyed in the last 10 years. Many of the previous surveys date to the 1980s through the early 2000s, prior to the widespread adoption of GPS technology by cultural resources consultants. Over 92% of the Proposed Route (7.39 of the 8 miles) has been subjected to past cultural resources survey, however, only 0.5 miles have been surveyed in the past 10 years. Any previously unsurveyed portions of the Proposed Route will be subjected to 100% pedestrian survey. Any surveys older than 10 years along the Proposed Route should be carefully evaluated against current standards, and resurvey is recommended

for any areas that have not been surveyed to current standards. Many surveys post-dating the mid-2000s are likely to meet current standards.

Previous site records show that 185 archaeological sites have been recorded within the Study Area. NRHP eligibility was assessed for these sites based on available information in AZSITE. Of the 185 known sites, 37 have been determined or recommended eligible for listing on the NRHP, 23 have been determined or recommended not eligible for listing, 123 have been recommended unevaluated by previous records, and 2 sites did not have eligibility information available. Eight previously recorded historic properties have the potential to be impacted by the Proposed Route. The South Gila Ditch, the Southern Pacific Railroad Mainline - Southern Route, Historic SR 84, and the Cortaro Farms Canal will not be impacted by the Proposed Route.

Potential impacts to AZ AA:12:466(ASM) can be avoided or minimized by utilizing the eastern side of the right-of-way in the vicinity of the site and having an archaeological monitor present during any ground disturbance to mitigate any encounters of archaeological materials or human remains should they occur.

The majority of AZ AA:12:646(ASM) has been subsumed by the residential neighborhood. Only a small portion of the site may remain along the Proposed Route. Impacts to the site may be avoided by placing transmission line structures and access roads outside the existing site boundary. If avoidance is not feasible, an archaeological monitor should be present during ground disturbance to mitigate any encounters of archaeological materials or human remains, should they occur.

AZ AA:12:1071 is immediately adjacent to the Proposed Route. Impacts to the site should be avoidable by designing structure locations and access roads to be outside the site boundary. If ground disturbance within the site boundary cannot be avoided, an archaeological monitor should be present.

AZ AA:11:12(ASM), the Hog Farm Ballcourt Site, cannot be avoided by any chosen route as the existing Marana substation is located within the site boundary. Portions of the site, including within the substation, have been subjected to a variety of archaeological testing and monitoring projects minimal findings. Impacts to the site can be minimized by using the fewest transmission poles necessary within the site, utilizing existing roads for access wherever feasible, and having an archaeological monitor present during ground disturbance.

Of the Preliminary Routes reviewed as part of the Study Area, the Proposed Route minimizes impacts on historic properties. All other route options would require passing through the outlying sites associated with the Marana Platform Mound Community.

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## EXHIBIT F – RECREATIONAL PURPOSES AND ASPECTS

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As stated in the Arizona Administrative Code R14-3-219, Exhibit 1:

*Exhibit F:*

*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.*

---

### OVERVIEW

Existing and future recreational sites within the Project area are managed by the Town of Marana and Pima County. Existing recreation opportunities found within the Project area include open space and trails along the Central Arizona Project (CAP) Canal and the Santa Cruz River, several district and community parks, neighborhood parks within residential development, bikeways, and the Juan Bautista De Anza National Historic Trail.

The central portion of the study area is identified by the Town of Marana General Plan 2040 as the Central Growth Area. The Central Growth Area is located north of the Santa Cruz River and west of the CAP Canal, outside of the developed neighborhood areas, the area consists largely of agricultural land. The Central Growth Area is envisioned to become the central activity hub in Marana, including event and gathering spaces, shops, entertainment destinations, and employment opportunities (Town of Marana 2019). The Project is not anticipated to impact future development plans identified within the Marana General Plan.

The Make Marana General Plan also identifies future land use plans for the Town of Marana. Much of the study area is classified as open space, traditional neighborhood, and master planned neighborhood areas. Open space land use classification is defined as areas intended for public recreation and resource conservation, including both active parks and passive undisturbed natural areas (Town of Marana 2019). This land use area is primarily located along the eastern portion of the study area along the CAP Trail system. Recreational trail systems, including the CAP Trail system, found in the eastern portion of the study area, and the Juan Bautista De Anza National Historic Trail, found in the western portion of the study area which generally follows the Santa Cruz River. Both trails are spanned by portions of the Proposed Route.

The Anza Trail Foundation (Anza Trail), a private non-profit organization in conjunction with the National Park Service has planned and administers the Juan Bautista De Anza National Historic Trail. The trail is found along the Santa Cruz River in the western portion of the study area. The Anza Trail does not own or manage any land or resources associated with the trail; rather, they work in partnership with federal, state, county, city, and other public agencies, as well as non-profit organizations, private landowners, volunteers, and others who maintain, build, certify, protect, and interpret the Anza Trail. The Anza Trail is partially developed and certified in the study area and includes a trailhead near North Trico Road near the bridge crossing over the Santa Cruz River. The trail is expected to continue to be developed along its historic path

into the future. The Proposed Route crosses Santa Cruz River and Anza Trail along an existing bridge on West Trico Marana Road approximately 1.88 miles to the southeast of the trail head, where impacts would be minimal.

Both trails support public outdoor activities such as hiking, horseback riding, mountain biking, and trail running, however, the Project is not anticipated to directly impact the trail system or accessibility.

The Pima County Planning and Regulation Department identifies existing and proposed recreational opportunities such as county parks, open space, and trails within Pima County (Pima County 2015). The Project would not cross existing or proposed parks and recreation facilities within Pima County.

If planned recreational activities are developed near the Project, AEPCO and TEP will cooperate with the appropriate planning authorities and communities to accommodate the appropriate recreational uses with consideration for the Proposed Routes operational and maintenance requirements, as well as safety considerations. It is not anticipated that the Project would significantly affect the future siting of proposed recreational facilities.

## REFERENCES

Town of Marana. 2019. Make Marana 2040 General Plan. Available at

<https://static1.squarespace.com/static/54cc191ce4b0f886f4762582/t/5e3d9511fa2d9e26eee804cd/1599766108480/Make+Marana+General+Plan+2040.pdf>.

Pima County. 2015. Pima Prospers Comprehensive Plan. Available at

[https://webcms.pima.gov/UserFiles/Servers/Server\\_6/File/Government/Pima%20Prospers/Official%20Plan/Official%20with%20revisions/Final%20Policy%20Document\\_Rev%202.19.pdf](https://webcms.pima.gov/UserFiles/Servers/Server_6/File/Government/Pima%20Prospers/Official%20Plan/Official%20with%20revisions/Final%20Policy%20Document_Rev%202.19.pdf)

## **EXHIBIT G – CONCEPTUAL DRAWINGS OF TYPICAL FACILITIES AND TRANSMISSION FACILITIES**

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As stated in the Arizona Administrative Code R14-3-219, Exhibit 1:

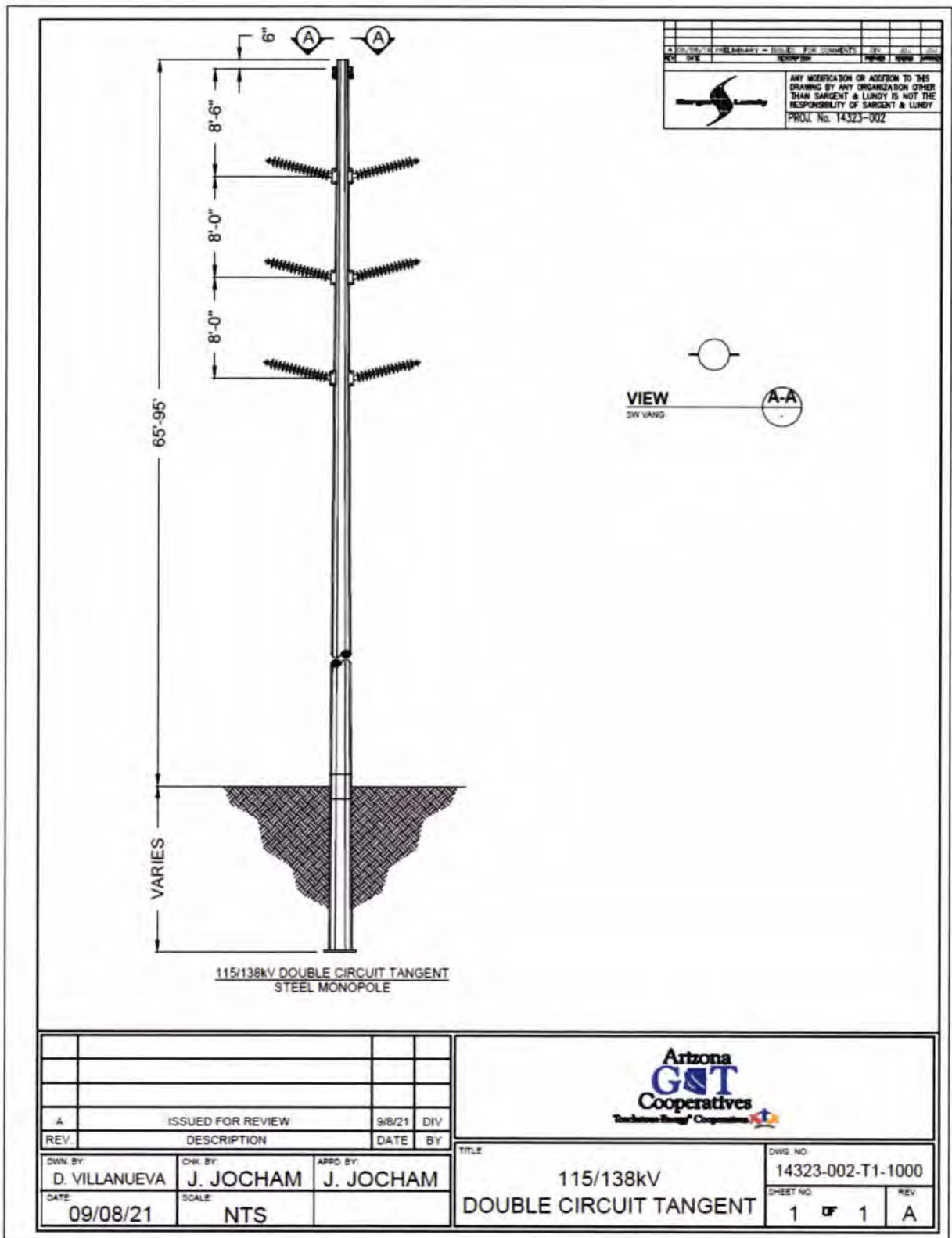
*Exhibit G:*

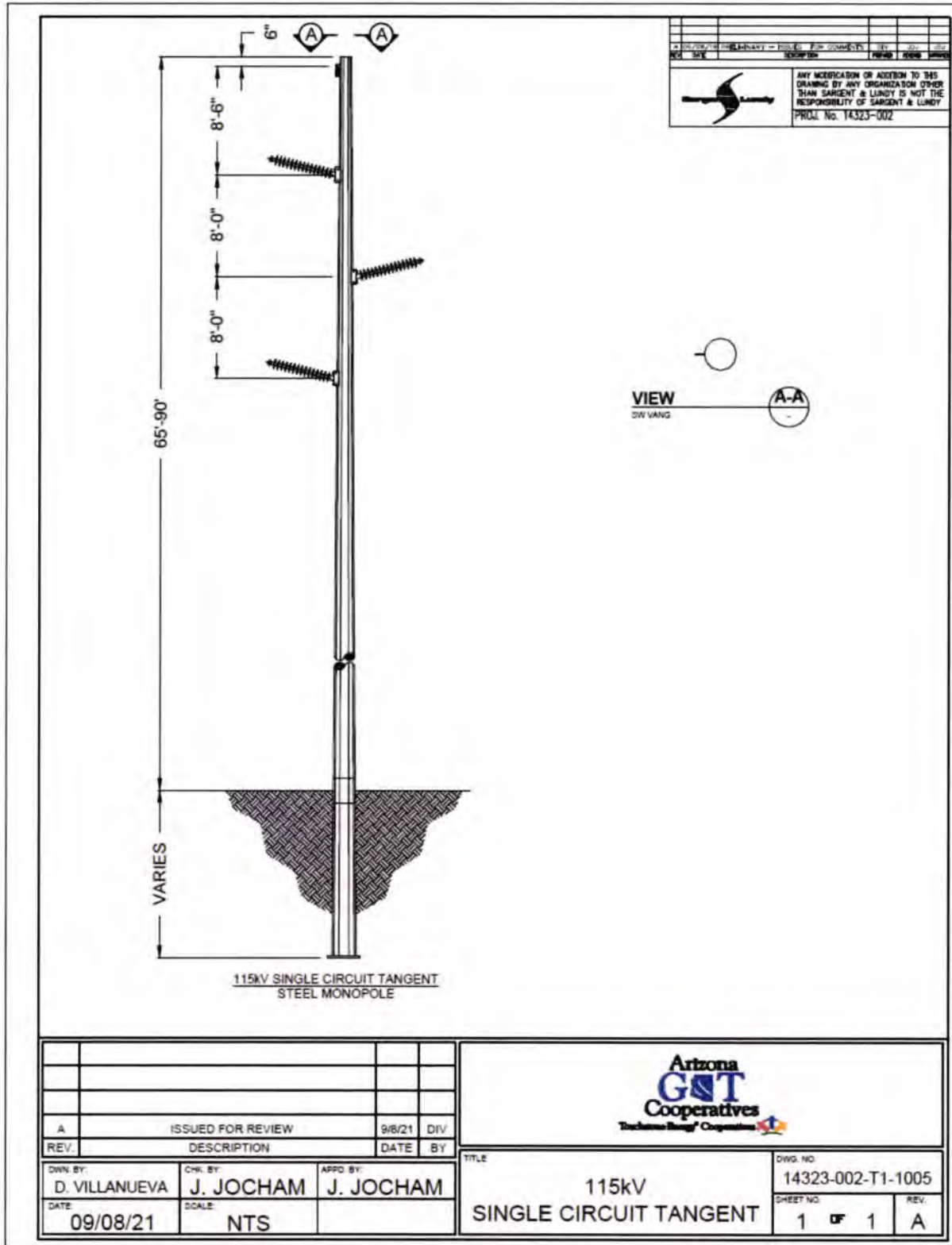
*Attach any artist's or architect's conception of the proposed plant or transmission line structures and switchyards, which applicant believes may be informative to the Committee.*

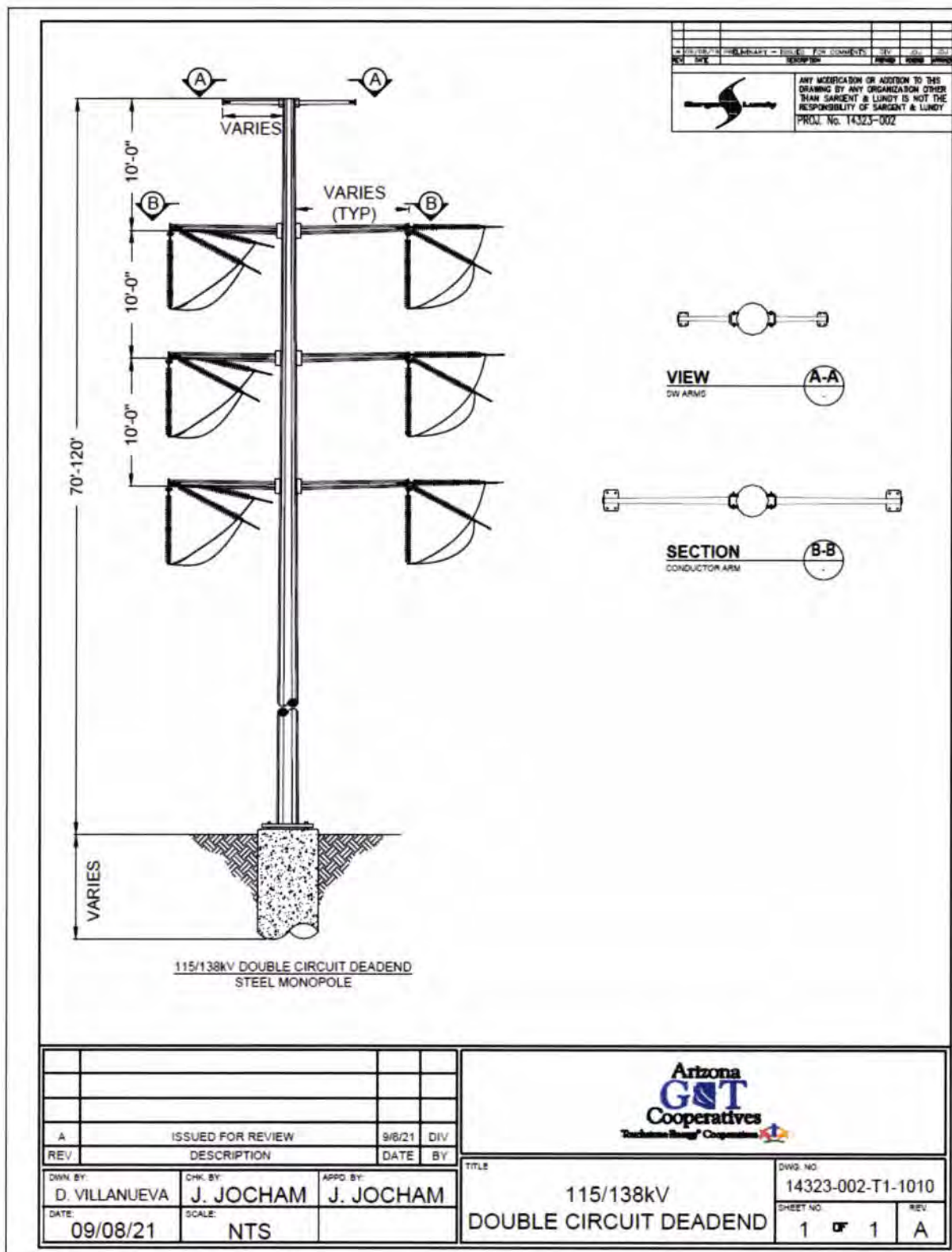
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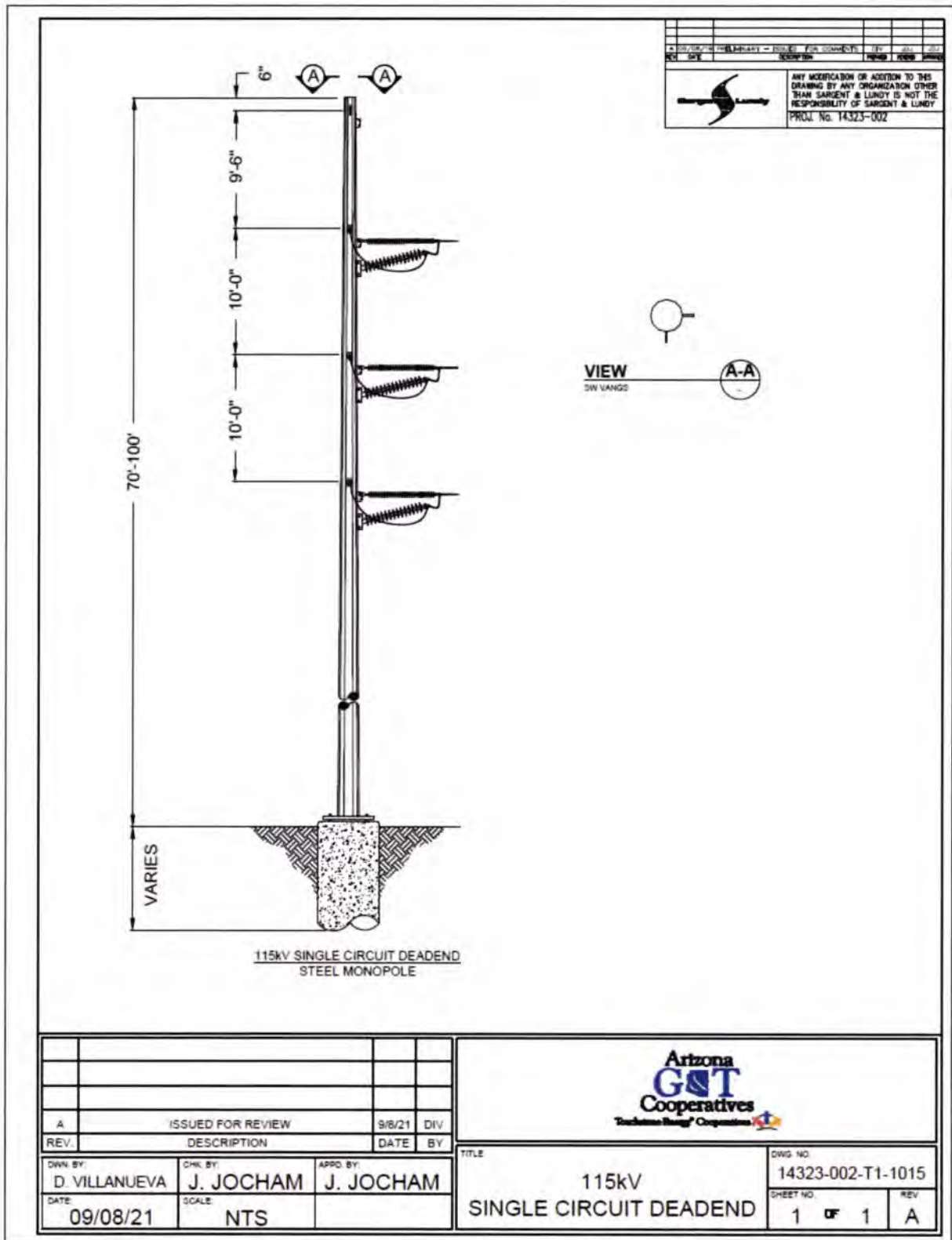
### **OVERVIEW**

The Project will utilize a range of structure types including the example conceptual drawings illustrated on the following pages.









## EXHIBIT H – EXISTING PLANS

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As stated in the Arizona Administrative Code R14-3-219, Exhibit 1:

*Exhibit H:*

*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.*

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### EXISTING PLANS

Landowners, jurisdictions, and agencies within the Project area were identified as part of the land use study to determine existing and planned land use and jurisdictional planning guidelines. Cities, towns, and counties typically have long-term plans that consider potential expansion of their current jurisdictional boundaries. These broader jurisdictional planning areas are reflected in officially adopted General Plans or Comprehensive Plans and identify desired future land use plans, including residential, commercial, industrial, recreations, educational, etc. uses to be considered for development within the community. These jurisdictional planning areas are important to consider when planning new electrical infrastructure, such as the proposed 115/138kV transmission lines. Land uses are mapped in Exhibit A-3 – Land Use and Exhibit A-4 – Planned Land Use.

As part of the land use study, general and specific plans were gathered for the Project area from Pima County and the Town of Marana. The Make Marana 2040 General Plan was referenced to accurately identify any future land use plans within the study area. Most of the central and western portion of the study area is classified as traditional neighborhoods and master planned neighborhood areas. These master plan areas are defined as areas guided by separate development approvals which establish the land use, densities, and intensities of specific areas, such as Sanders Groves, Villages of Tortolita, and Uptown at Marana (Town of Marana 2019). Exhibit H-1 identifies future plans that have been reviewed and approved in most of these master plan areas within proximity to the Proposed Route. Each of these master plans were reviewed and taken into consideration during the siting process and evaluation of the Proposed Route.

Other future land uses taken into consideration during the Project siting process include the review of recreational or undeveloped land use areas within the study area. The Pima County Development Services (Planning Department) identifies existing and proposed recreational opportunities such as county parks, open space, and trails within Pima County (Pima County 2015). Parks and recreational areas such as the Central Arizona Project (CAP) Canal open space and trail corridor, found in the eastern portion of the study area was identified and examined to preserve the recreational use and scenic quality of the area to the extent possible.

The Anza Trail Foundation (Anza Trail), a private non-profit organization in conjunction with the National Park Service has planned and administers the Juan Bautista de Anza National Historic Trail. The trail is found along the Santa Cruz River in the western portion of the study area. The Anza Trail does not own or manage any land or resources associated with the trail; rather, they work in partnership with

federal, state, county, city, and other public agencies, as well as non-profit organizations, private landowners, volunteers, and others who maintain, build, certify, protect, and interpret the Anza Trail. The Anza Trail is partially developed and certified in the study area and includes a trailhead near North Trico Road near the bridge crossing over the Santa Cruz River. The trail is expected to continue to be developed along its historic path into the future.

Additionally, further consideration and review of any future land use plans within the study area were conducted during various agency briefing meetings. During these briefing meetings, Arizona Electric Power Cooperative, Inc. (AEPCO) reviewed the Project purpose and need, engineering data, environmental data, and the public involvement process that was being conducted to engage stakeholders in the community. Further details of the meetings are presented in Exhibit J – Special Factors, which provides details regarding the public involvement process.

One of the key aspects of the briefings with the agencies was to exchange information regarding existing and future plans being contemplated for the Project area. There was valuable information shared by all the Project briefing participants. Through this briefing process we identified conceptual land use plans, new developments recently approved, and plans that were expected to be approved soon. In some cases, we were notified of new projects that recently broke ground for construction. This information was critical to conducting the environmental and engineering studies and identifying the Proposed Route for the transmission line.

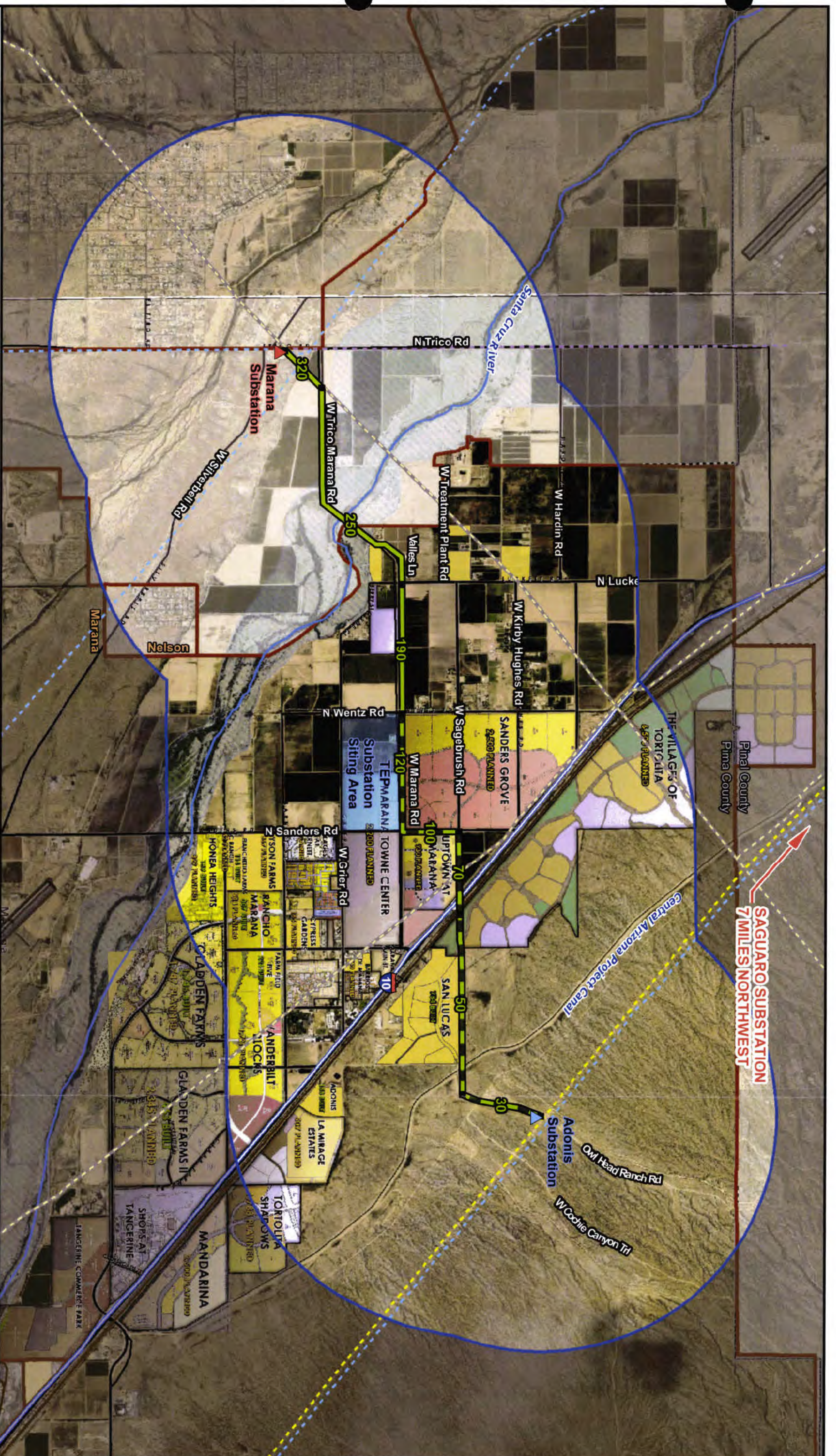
Table H-1 identifies the briefings that were conducted, and Table H-2 indicates all the relevant comprehensive or general plans used to identify the plans of the federal, state, local, and private stakeholders in the area.

**Table H-1 – Stakeholder Engagements**

<b>Event</b>	<b>Date</b>
Town of Marana	June 23, 2021
Pima County	August 4, 2021
Arizona State Land Department	August 17, 2021

**Table H-2 – Comprehensive or General Plans Used**

	<b>Title</b>	<b>Date</b>	<b>URL</b>
<b>Pima County</b>	Pima Prospers; Comprehensive Plan	May 19, 2015	<a href="https://webcms.pima.gov/UserFiles/Server/s/Server_6/File/Government/Pima%20Prosper/Official%20Plan/Official%20with%20revisions/Final%20Policy%20Document_Rev%202.19.pdf">https://webcms.pima.gov/UserFiles/Server/s/Server_6/File/Government/Pima%20Prosper/Official%20Plan/Official%20with%20revisions/Final%20Policy%20Document_Rev%202.19.pdf</a>
<b>Town of Marana</b>	Make Marana; 2040 General Plan	December 10, 2019	<a href="https://static1.squarespace.com/static/54cc191ce4b0f886f4762582/t/5e3d9511fa2d9e26eee804cd/1599766108480/Make+Marana+General+Plan+2040.pdf">https://static1.squarespace.com/static/54cc191ce4b0f886f4762582/t/5e3d9511fa2d9e26eee804cd/1599766108480/Make+Marana+General+Plan+2040.pdf</a>



**SAGUARO SUBSTATION**  
7 MILES NORTHWEST

- Reference Features**
- Study Area
  - Interstate
  - Major Roads
  - Local Road
  - Railroad
  - County Boundary
  - Municipal Boundary
- Utilities**
- Existing Substation
  - Proposed Substation
  - Existing Pipeline
- Existing Transmission Lines**
- Existing 138kV Transmission Line
  - Existing 115kV Transmission Line
  - Existing 24.9kV Distribution Line
- Planning**
- Town of Marana Planning Data
  - \*Approved and conceptual planning data provided by Town of Marana, 2021

- Proposed Route**
- Proposed Route Single Circuit 115kV
  - Proposed Route Double Circuit 115/138kV
  - Route Link Node
  - Route Link Number
- Scale in Feet  
1 inch = 4,000 feet (1:48,000)  
When Plotted at 11x17

**Arizona G&T Cooperatives**  
**BURNS & MCDONNELL**

**Exhibit H-1**  
**Existing Plans**  
Saguardo - Marana 115/138kV Transmission Line Project  
Arizona G&T Cooperatives

## REFERENCES

Town of Marana. 2019. Make Marana 2040 General Plan. Available at

<https://static1.squarespace.com/static/54cc191ce4b0f886f4762582/t/5e3d9511fa2d9e26eee804cd/1599766108480/Make+Marana+General+Plan+2040.pdf>.

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## **EXHIBIT I – ANTICIPATED NOISE/INTERFERENCE WITH COMMUNICATION SIGNALS**

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As stated in the Arizona Administrative Code R14-3-219, Exhibit 1:

*Exhibit I:*

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

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The studies for noise and interference with communication signals are presented in the following pages.



# ARIZONA ELECTRIC POWER COOPERATIVE ADONIS-MARANA 115KV TRANSMISSION LINE ANTICIPATED NOISE EMISSION LEVELS AND INTERFERENCE

Revision A

**PRELIMINARY – NOT FOR CONSTRUCTION**

Project No.: 14323-002

55 East Monroe Street  
Chicago, IL 60603-5780 USA  
312-269-2000  
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## ISSUE SUMMARY AND APPROVAL PAGE

This is to certify that this Anticipated Noise Emission Levels and Interference Report has been prepared, reviewed, and approved in accordance with Sargent & Lundy's Standard Operating Procedure SOP-0405, which is based on ANSI/ISO/ASSQC Q9001 Quality Management Systems.

### CONTRIBUTORS

Prepared by:

_____ <b>Justin Stiener</b> Associate	_____ 4/21/2022 <b>Date</b>
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Reviewed by:

_____ <b>Jason Jocham</b> Senior Associate	_____ 4/21/2022 <b>Date</b>
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Approved by:

_____ <b>Jason Jocham</b> Senior Manager	_____ 4/21/2022 <b>Date</b>
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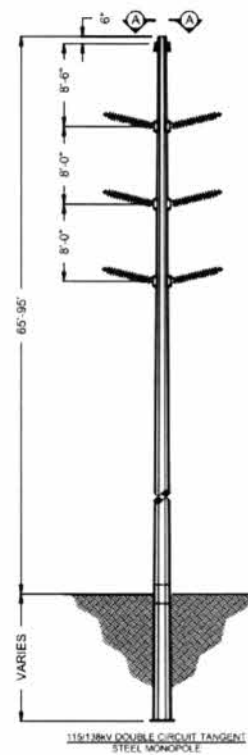
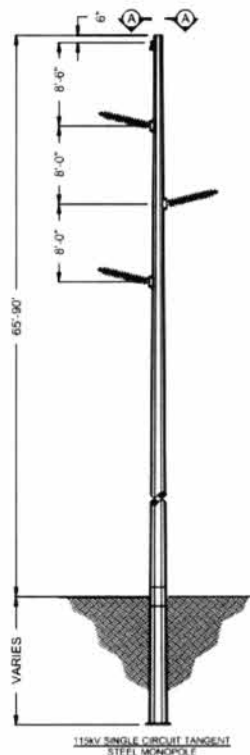
## 1.0. Purpose and Introduction

The purpose of this document is to provide the information as stipulated by the Arizona Corporation Commission Article 2 - Rules of Practice and Procedure Before Power Plant and Transmission Line Siting Committee Exhibit 1 which states the following under the section titled "Exhibit I":

"DESCRIBE THE ANTICIPATED NOISE EMISSION LEVELS AND ANY INTERFERENCE WITH COMMUNICATION SIGNALS WHICH WILL EMANATE FROM THE PROPOSED FACILITIES."

Overhead transmission lines are an inherent source of non-ionizing radiation and extremely low frequency electric and magnetic fields (50-60 Hz range for North America). When the electric field intensity at the conductor surface rises above a certain critical level, corona discharges occur. Corona discharge on conductors produces a number of effects such as radio interference (RI), television interference (TVI), and audible noise (AN). These effects can be minimized by considering transmission line design and location during detailed design.

This project involves two different line configurations which have been evaluated for corona, audible noise, radio interference, television interference, and electric and magnetic field effects using the Bonneville Power Administration (BPA) Corona and Field Effects Program. Corona and Field Effects Program is an industry standard software that determines the magnitude of the above described field effects. The first configuration is a single circuit 115kV delta arrangement and the second configuration is a double circuit vertical arrangement which consists of one (1) 115kV circuit and one (1) 138kV circuit.



## **2.0. Field Effects**

### **2.1. *Corona***

Corona discharges occur on transmission lines when the intensity of the electric field at the conductor surface is above a critical value causing the ionization of the air surrounding the conductor. Therefore, corona discharge is a function of the voltage gradient. Corona occurs on all voltages of electric transmission lines, but it becomes larger and more noticeable at higher voltages such as EHV or Extra High Voltage level (345kV and above). It is the intent of utilities and design engineers to minimize corona not only for effects to the surrounding communities but also corona equates to loss of power, and in extreme conditions it can damage transmission line components.

Several factors have influence on the voltage gradient including conductor surface roughness (nicks, burrs, scratches), meteorological conditions, voltage, phase spacing, phase configuration and the conductor position in regard to the ground. Furthermore, when water is deposited on the transmission line conductors due to condensation or rain this increases the conductor surface irregularity and increases corona discharge. For the transmission line design configurations considered for this project, the calculated peak voltage gradient for the single circuit configuration at the conductor surface is 8.57kV/cm. For the double circuit line configuration, the calculated peak voltage gradient at the 115kV and 138kV conductor surfaces is 9.53kV/cm and 11.50kV/cm, respectively. For the purpose of comparison, the breakdown strength of air is 21.1 kVrms/cm at 25 °C and 76 mm barometric pressure.

### **2.2. *Audible Noise***

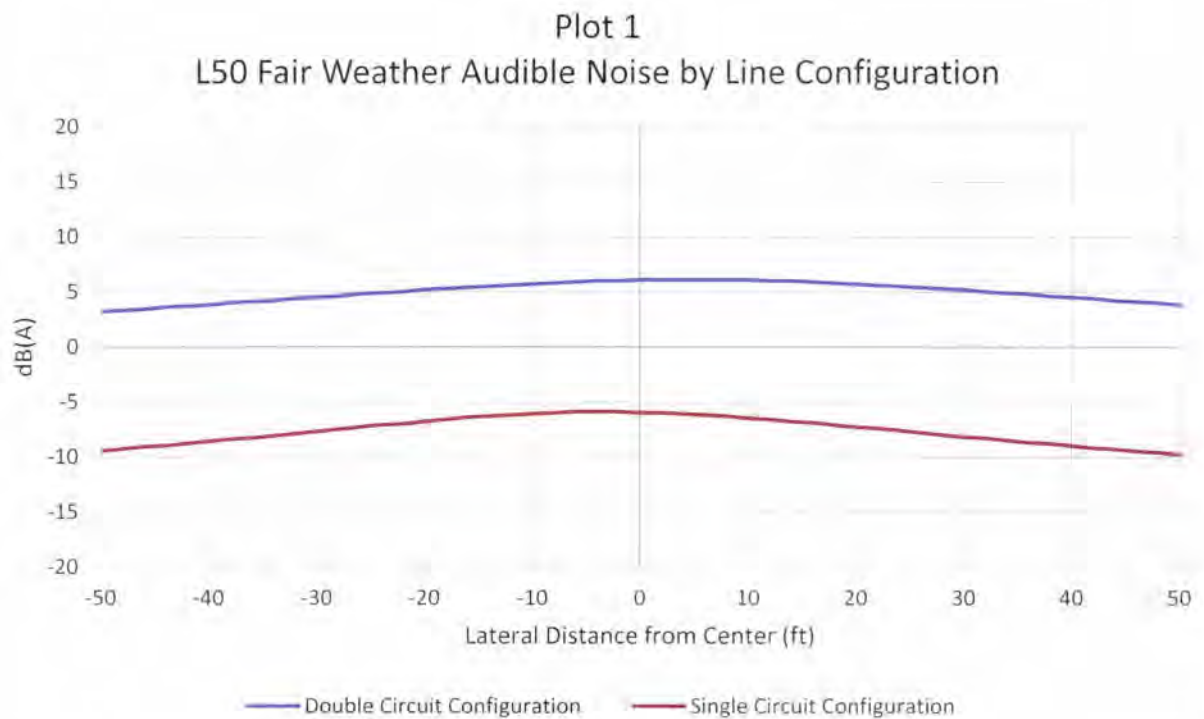
Audible Noise of a transmission line is directly correlated to corona discharge on a transmission line. Therefore, an increase in corona has a subsequent increase in Audible Noise. Audible Noise generated by corona has two major components: the “broadband noise” and the “hum.” The “broadband noise” has a significant high-frequency content that results in the cracking, frying, or hissing characteristics of transmission line noise. The “hum” has the low-frequency components which are equal to twice the power frequency (120 Hz for a 60-Hz system). Audible noise from transmission lines is most notable in poor weather conditions, rain in particular. Water drops striking or collecting on the conductors produce a large number of corona discharges, each of them creating a burst of noise. In dry conditions, the conductors usually operate below the corona-inception level, and very few corona sources are present.

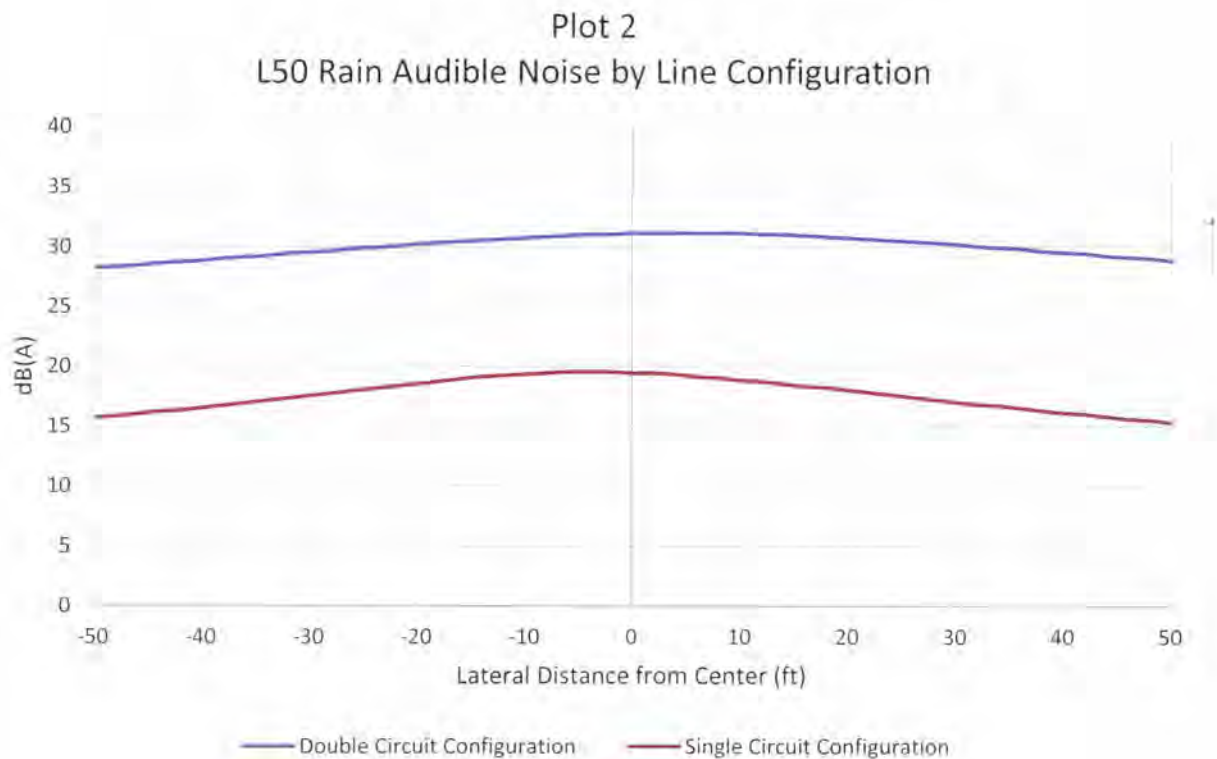
The most important weather condition, from a design point of view, is rain because of all foul-weather conditions this is the one most often encountered. Audible noise is usually masked during falling rain, and complaints are expected to be minimal. A greater awareness of the noise emanating from the lines occur during light rain and fog conditions, especially early morning, when the ambient noise is relatively low. However, a transmission line designed to have an acceptable audible noise level in rain will usually not generate appreciable audible noise in fair weather. In addition to the weather condition, other design aspects affecting corona-induced audible noise are conductor surface gradient, conductor diameter, number of conductors, line geometry and conductor surface conditions.

For this project, audible noise is calculated using an “A” weighted scale for a 100 ft width centered at the structure centerline. Under foul (rain) conditions, the maximum calculated audible noise for the single circuit and double circuit configurations at a 37.5ft offset is 16.7 dB(A) and 29.8 dB(A), respectively. At a 50 ft offset under foul (rain) conditions, the maximum calculated audible noise for the single circuit and double circuit configurations is 15.5 dB(A) and 28.8 dB(A), respectively.

Under fair conditions, the maximum calculated audible noise for the single circuit and double circuit configurations at a 37.5ft offset is -8.3 dB(A) and 4.8 dB(A), respectively. At a 50 ft offset under fair conditions, the maximum calculated audible noise for the single circuit and double circuit configurations is -9.5 dB(A) and 3.8 dB(A), respectively. A negative dB(A) value represents a noise that is below the threshold of the human ear, therefore the transmission line will have no audible noise to the average human ear.

In locations where there are no state, county or city regulations available, best engineering practice limits audible noise at the edge of the right of way to no more than  $L_{50} = 53$  dB(A) during measurable rain. This design limit is based on the audible noise complaint guidelines published by Perry from BPA in 1972. His findings are based on probability of receiving noise complaints and concluded that an audible noise level less than or equal to 53 dB(A) at the edge of right of way generated no complaints. Plots 1 and 2 show the calculated  $L_{50}$  fair weather and  $L_{50}$  rain audible noise levels for the single circuit and double circuit line configurations, these values fall well under the best engineering practice limit of 53 dB(A). In addition, the audible noise calculated for this transmission line is consistent with other similar 115kV/138kV lines, no issues with noise generated from the transmission line are anticipated.





### 2.3. Radio Interference

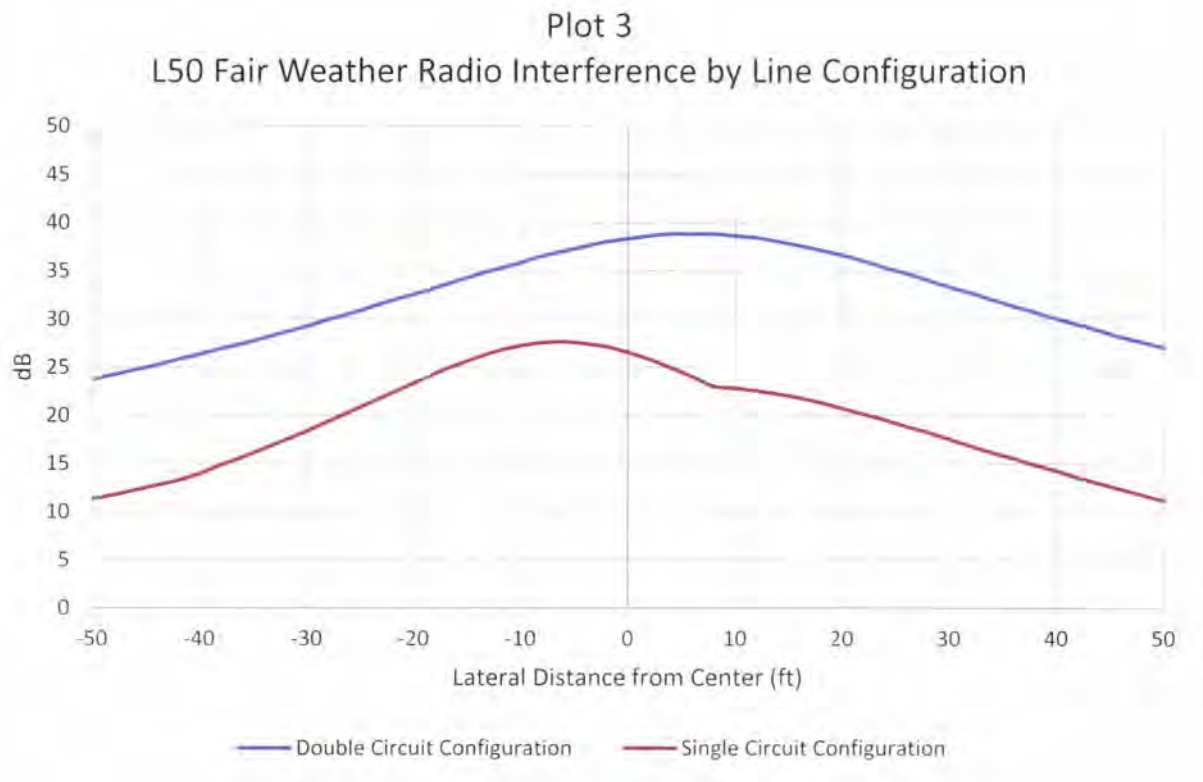
Radio interference from transmission lines occurs when the electric field at the conductor surface exceeds a critical value resulting in the ionization of the air surrounding the conductor followed by corona discharge. It is defined by EPRI as the degradation of the reception of a wanted signal caused by radio frequency (RF) disturbance. This radio frequency disturbance affects the amplitude modulated (AM) radio band, but not the frequency modulated (FM) radio band. It is difficult to assess the significance of corona interference to AM radio band because the complaint experience of the utility industry is nearly zero. One reason for this is the popularity of FM Broadcasting which is not affected, for the most part, by man-made electromagnetic interference. FM Broadcast signals are for all practical purposes immune from broadband interference since their carrier signals are frequency modulated.

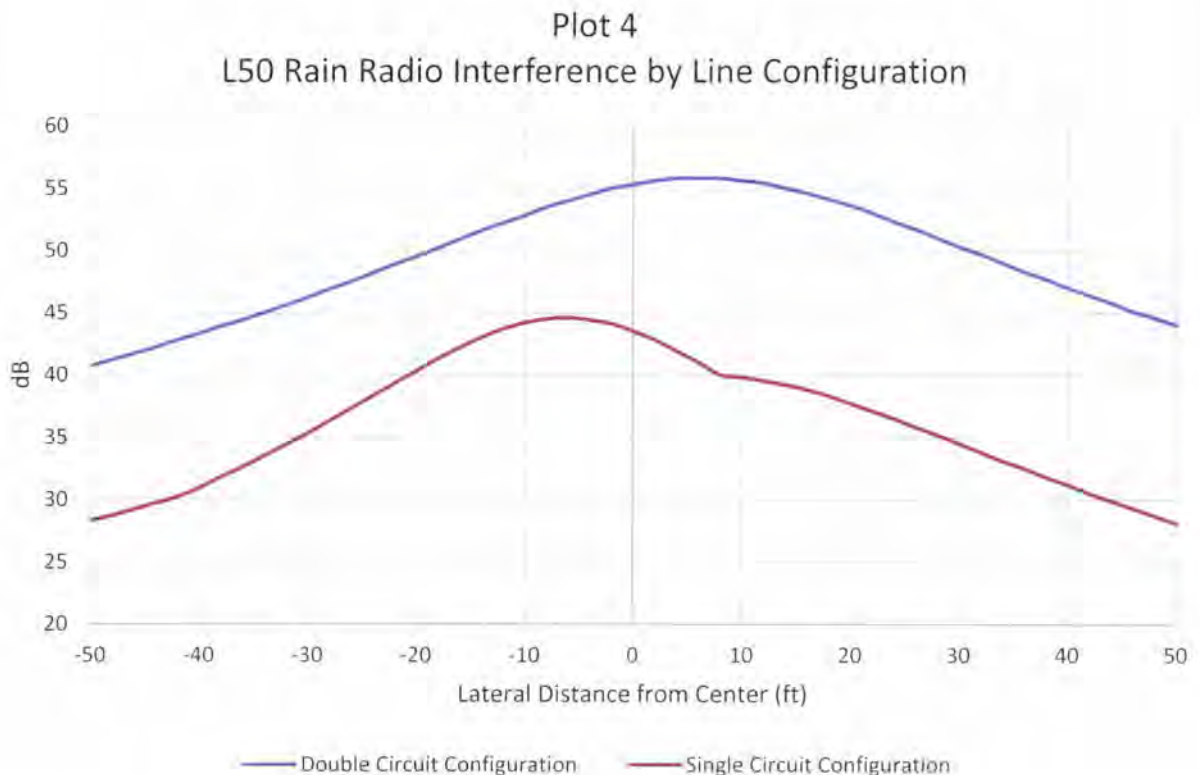
A frequency of 1 MHz is commonly used in calculating the anticipated transmission line radio interference. It is typically measured in decibels (dB) of one microvolt per meter, which is a logarithmic scale. The values provided in Plot 3 show that the anticipated fair weather radio interference for the single circuit and double circuit configurations fall below the maximum IEEE guideline of 40 dB. The values provided in Plot 4 show the anticipated foul (rain) weather radio interference levels.

Under foul (rain) conditions, the maximum calculated radio interference for the single circuit and double circuit configurations at a 37.5ft offset is 32.6 dB and 48.3 dB, respectively. At a 50 ft offset under foul (rain) conditions, the maximum calculated audible noise for the single circuit and double circuit configurations is 28.3 dB and 44.0 dB, respectively.

Under fair conditions, the maximum calculated audible noise for the single circuit and double circuit configurations at a 37.5ft offset is 15.6 dB and 31.3 dB, respectively. At a 50 ft offset under fair conditions, the maximum calculated audible noise for the single circuit and double circuit configurations is 11.3 dB and 27.0 dB, respectively. These calculated values fall well below the IEEE specified maximum of 38 dB.

Experience for lines similar in design spanning similar terrain has shown radio interference to be acceptable. If radio interference caused by the transmission line were to become unacceptable in each situation, the utility is willing to work with the complainant to resolve the interference problem.





## 2.4. Television Interference

Television interference effects due to transmission effects analog television. Typically, television interference (TVI) only affects the lower VHF band (Channels 2 through 6) and no interference will be experienced in the upper VHF (Channels 7 - 13) and UHF bands (Channels 14 - 83) even during foul weather. Under the Digital Transition and Public Safety Act of 2005 full power analog TV broadcast ended in June of 2009. Given that present-day television broadcast primarily occurs over a digital medium, television interference problems warranting any sort of corrective action are extremely unlikely.

Experience for lines similar in design spanning similar terrain has shown television interference to not be an issue. If TVI caused by the transmission line were to become unacceptable in each situation, the utility is willing to work with the complainant to resolve the interference problem. No transmission line generated TVI is expected along the lines, even during periods of foul (rain) weather.

## 2.5. Electric and Magnetic Field Effects

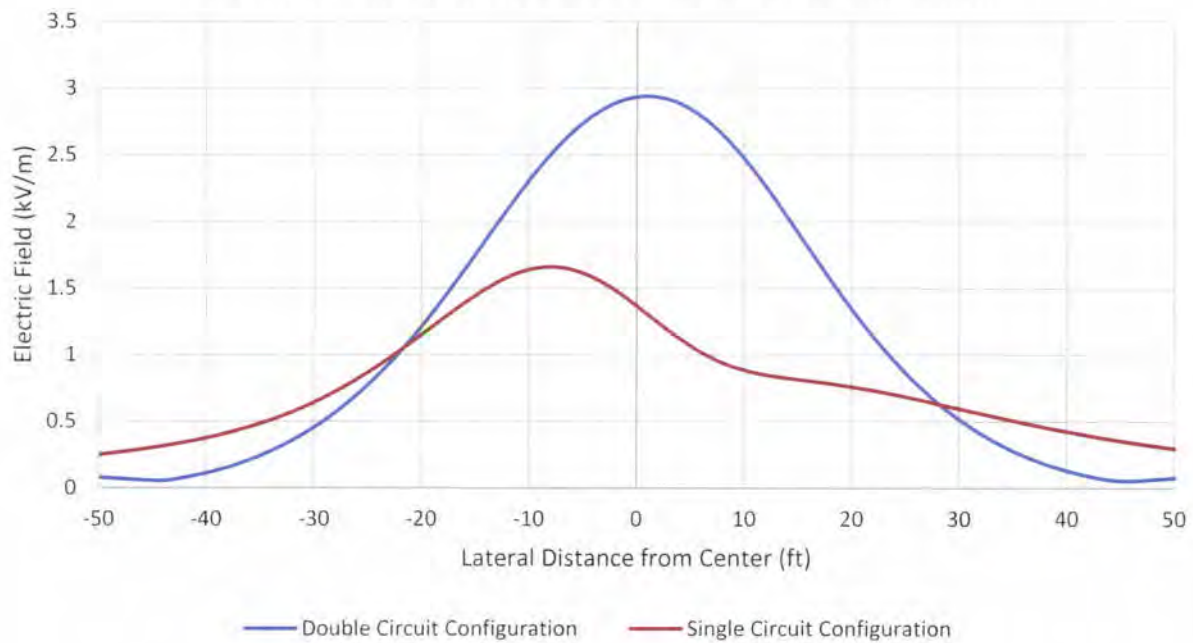
Transmission line electric and magnetic field (EMF) effects are predominantly electric and magnetic fields which induce voltages and currents on conductive objects which are located near transmission lines. Electric and magnetic fields are generated by electrical charges and by their movement (electric currents). Voltage is the source of electric fields and current is the source of magnetic fields. A source of EMF may be considered important because of the level of the electric and magnetic field that is generated or because of the duration of the exposure to that source's field.

Electric fields are considered in line design and operation. They are important in terms of induction on vehicles and other conductive objects, shocks caused by spark discharges, line impedances, power losses, pole fires, railroad signal interference, and corrosion of pipelines running in parallel with the transmission lines. For transmission line clearances affected by fields, NESC rule 232C1c states the following: "For voltages exceeding 98 kV ac to ground, either the clearances shall be increased or the electric field, or the effects thereof, shall be reduced by other means as required to limit the steady-state current due to electrostatic effects to 5 mA rms if the largest anticipated truck, vehicle, or equipment under the line were short-circuited to ground." Therefore, the transmission line is designed to limit the electrostatic effects of the transmission line on objects to 5mA or below. For this project, no electrostatic induction problems are anticipated. Should any problems arise with electrostatic induction due to the transmission line, the problem can easily be remedied by grounding the affected objects.

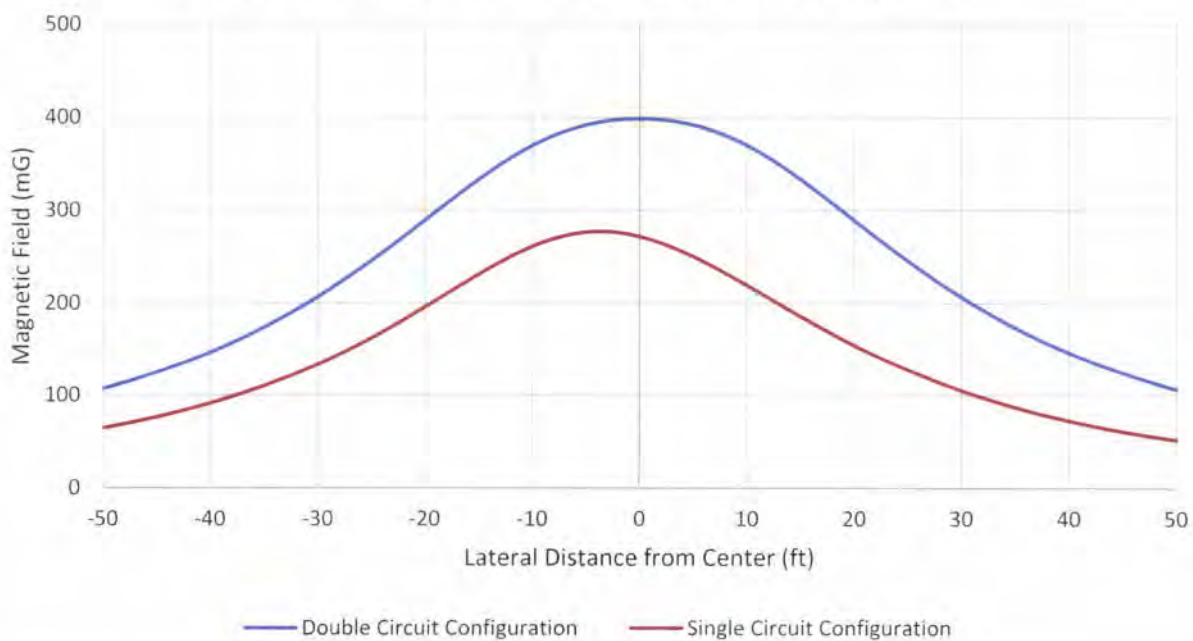
Magnetic fields are important in terms of induction in parallel wires, interference with the proper operation of computer monitors and pacemakers. However, the major focus of attention is on the long-term exposure of people to electric and magnetic fields and its possible health effects. For most health outcomes, there is no definitive evidence that extended periods of low frequency EMF exposures have adverse effects. There is some evidence from epidemiological studies that exposure to power-frequency magnetic field is associated with an increased risk of childhood leukemia. However, to date, no health effect of alternate EMF fields of the type and value as those existing in transmission-line and station environments has been conclusively found nor accepted by the scientific community. The anticipated magnetic fields (calculated at 1 meter) for the single circuit and double circuit configurations are shown in Plot 6, the magnetic fields shown in Plot 6 are consistent with similar transmission lines at 115kV/138kV.

The anticipated electric fields (calculated at 1 meter) for the single circuit and double circuit configurations are shown in Plot 5. IEEE C95.6 specifies a maximum electric field of 10kV/m within right of way, easement, or power line corridor and 5kV/m for persons in unrestricted environments. The values shown in Plot 5 are well within these limits for both configurations.

Plot 5  
Calculated Electric Field (kV/m) by Line Configuration



Plot 6  
Calculated Magnetic Field (mG) by Line Configuration



### **3.0. Evaluation Tools**

All calculations performed for the purpose of generating this report were performed using the Bonneville Power Administration Corona & Field Effects Program v3.1.

### **4.0. References**

1. EPRI AC Transmission Line Reference Book – 200 kV and Above, 2015 Edition (November 2015)
2. National Electrical Safety Code (NESC) - 2017 Edition (C2-2017)
3. IEEE C95.6 – Standard for Safety Levels with Respect to Human Exposure to Electromagnetic Fields, 0-3 kHz.", 2019
4. IEEE - "Review of Technical Considerations on Limits to Interference from Power Lines and Stations", IEEE Radio Noise and Corona Subcommittee Report, RI Limits Task Force, Working Group #3, IEEE Transactions on Power Apparatus and Systems, Vol. PAS-99, No. 1, Jan./Feb. 1980, pages 365-388.

## EXHIBIT J – SPECIAL FACTORS

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As stated in the Arizona Administrative Code R14-3-219, Exhibit 1:

*Exhibit J:*

*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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### PUBLIC ENGAGEMENT

#### INTRODUCTION

A number of considerations are needed when determining location for a transmission line, such as existing and planned land use and environmental/visual consideration. Public input is also a critical consideration in the siting/planning process for the Project. Gathering public input is traditionally accomplished via in-person public meetings and an online presence to provide opportunities for the community to learn about the Project and weigh in on the analysis.

Virtual public engagement was used in place of traditional in-person public meetings due to the COVID-19 pandemic and to capture a broader audience than would attend in traditional public meetings. To engage and involve stakeholders and the public, a website and virtual open house launched in January of 2022. The website contains text, images, and downloadable PDF files displaying project-related materials such as maps, charts, infographics, etc. The materials are deliberate about providing the information that people need to give meaningful input on the Project.

Three phases of engagement were conducted throughout the planning process. The initial phase occurred from Summer of 2021 through the end of that year. During that time the project team engaged with government agencies to gather officials' input. A member of the Project team also engaged with an interested landowner while conducting a site visit. The second phase began in January of 2022 with the launch of a Project virtual open house website and distribution of an informational newsletter to all property owners and residents within 1 mile of the various links in the Project study area. The newsletter included details on the Project, a map of the study area, a Project hotline phone number, and a Project email address. The public was able to provide comments and take a survey regarding the Project and route selection on the virtual open house website. The third phase of public engagement was marked by the distribution of a postcard and updating of the Project virtual open house website on March 9, 2022. The postcard and website announced the selection of a Proposed Route and the upcoming Certificate for Environmental Compatibility (CEC) hearing, and included the Project hotline phone number, and the Project email address. The postcard was distributed to all valid addresses for property owners and residents within 1 mile of the Proposed Route and alternative links in the Project study area.

## 2021 PUBLIC ENGAGEMENT (PHASE 1)

Starting in June of 2021, the Project team conducted meetings to inform government agencies about the Project. These agencies included the Town of Marana, Pima County, and the Arizona State Land Department. In addition to informing them about the Project, the team was able to gather information and data useful to the Project and designate a primary point of contact and process for communicating with these entities and their elected officials. See notes from those meetings on the following page.

### Agency Engagement

Engagement Date	Stakeholder	Notes
June 23, 2021	Town of Marana	The Project team held an in-person meeting with members of this agency to inform the department that the Project would connect the proposed Trico Electric Cooperative's Adonis Substation to Arizona Electric Power Cooperative's existing Marana Substation. Kevin Barnes provided an overview of the Project purpose and need, and the proposed facilities to be constructed. Mr. Barnes reviewed the schedule for planning and construction of the Project. Randall Simpson provided an overview of the planning process being used to identify the alternative routes and the final preferred route for construction. Mr. Simpson provided an overview of the siting studies, existing and future land use data, opportunities and constraints analysis, and preliminary route segments identified. Town of Marana representatives discussed the status of two key master planned developments including the Villages at Tortolita and Sanders Grove. The North Adonis Road would need to be extended and Interstate 10 interchange improved to serve Villages at Tortolita. Sanders Grove may be easier to develop since road improvements are not as difficult and expensive but may require realigning Sanders Road. Town of Marana suggested reviewing a lot of options and giving the public a chance to review and comment. They also inquired about the feasibility of the line being constructed underground. Mr. Barnes stated that higher voltage lines are not typically placed underground. Mr. Barnes indicated the costs can be significant, approximately 10 times overhead and may require additional right-of-way for trenching during construction.
August 4, 2021	Pima County	The Project team held an in-person meeting with members of this agency to inform the department that the Project would connect the proposed Trico Electric Cooperative's Adonis Substation to Arizona Electric Power Cooperative's existing Marana Substation. Kevin Barnes provided an overview of the Project purpose and need, and the proposed facilities to be constructed. Mr. Barnes reviewed the schedule for planning and construction of the Project. Randall Simpson provided an overview of the planning process being used to identify the alternative routes and the final preferred route for construction. Mr. Simpson provided an overview of the siting studies, existing and future land use data, opportunities and constraints analysis, and preliminary route

		segments identified. Pima County representatives provided comments regarding floodplains along Santa Cruz River, including concern development within floodplain that could affect river flow and adjacent areas along link segments 270, 280, and 250. Pima County expressed concern for conservation parcels along Santa Cruz River that were acquired to protect potential resources. Pima County does not manage Juan Bautista National Historic Trail and trailhead. Pima County indicated that for the rural roadways we are following that they are likely to be widened in relationship to the future development that occurs, which could be 150' right-of-way on largest roads. No immediate plans for widening roads in rural areas. Pima County has been participating in the Interstate 11 planning process. They do not like the Arva Valley alternative as well as it cuts through Santa Cruz River and conservation lands, requiring significant mitigation. Pima Map Guide (Pima Maps) provides a lot of data for county resources.
August 17, 2021	Arizona State Land Department	The Project team held a virtual meeting with members of this agency to inform the department that the Project would connect the proposed Trico Electric Cooperative's Adonis Substation to Arizona Electric Power Cooperative's existing Marana Substation. The department suggested that the Project team co-locate the transmission line if possible, especially regarding Line 30 which follows an existing road, allowing for co-location. The department also asked when cultural teams would begin work. A representative of WestLand Resources answered that those teams would begin work the following week.

### **Landowner Engagement**

<b>Engagement Date</b>	<b>Stakeholder</b>	<b>Notes</b>
November 2, 2021	Gregory Matzuk, Resident of San Lucas Community	Randall Simpson from Burn & McDonnell was conducting field work taking photographs of Link Segment 50 for the Proposed Route. The photographs were used to prepare Exhibits E-2.2 and E-2.3 – Visual Simulation 1. Mr. Matzuk was working outside the front of his home and approached Mr. Simpson to inquire the nature of the work he was performing. Mr. Simpson introduced the project to Mr. Matzuk and explained the purpose and need of the project, the type of facilities being planned, and the alternatives that were being studied during the course of the evaluation. In particular, Mr. Simpson discussed the Link Segment 50 adjacent to the property line on the north side of the San Lucas Community subdivision wall. Mr. Matzuk asked if that was the only option and Mr. Simpson explained that Link Segment 40 1 mile to the north would provide an alternative to that route and that it was being studied as well. Mr. Matzuk explained that he would be concerned about the visual appearance of the proposed transmission line and would also have concerns for health issues due to electric and magnetic fields. He was concerned that it would affect his property value (?) and said he would plan to sell

		his property if the line were to be built in that location. Mr. Simpson told him that there would be a public comment period during the coming weeks including mailing newsletters and an information website that would provide additional information on the Project. Mr. Simpson also told Mr. Matzuk the newsletters and website would contain contact information that would allow him to communicate with project representatives and provide verbal or written comments regarding his concerns.
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## **JANUARY-MARCH 2022 PUBLIC ENGAGEMENT (PHASE 2)**


Following public engagement in 2021, the Project entered its second phase during which where multiple strategies for engagement were used, including the mailing of an informational newsletter, use of social media to notify the public about the project, launching of a project virtual open house website, and engagement with the Arizona Department of Transportation.

### **Newsletter**

The newsletter was mailed on January 11, 2022 to all property owners and residents within 1 mile of the various links in the Project study area. The newsletter contained an explanation of the need for the Project, a detailed Project description, a photo and diagram of potential structures to be used for the Project, a projected schedule, an explanation of the importance of public engagement, and project-related contact information. A map of the Project study area and potential routes was included with the newsletter. Thumbnails of those materials are available below and full page versions are available following Exhibit J.

## Saguaro to Marana 115/138kV Transmission Line Project

Este boletín está disponible en español en el sitio web



**Project Purpose and Need**

Arizona Electric Power Cooperative Inc. (AEP&CO) and Tucson Electric Power (TEP) are planning new electrical infrastructure to serve the town of Marana, Arizona and the surrounding area.

The Saguaro to Marana Project planning process is being conducted for AEP&CO to construct a new 115 kilovolt (kV) transmission line between the planned Tri-County Electric Cooperative Inc. Adena Substation and existing Marana Substation. The Project will connect to the existing Saguaro Substation located approximately 7 miles northwest of Marana using an existing transmission line. TEP has identified the need for a new 138kV substation within the town of Marana. TEP will need a 138kV transmission line to provide power to this substation.

The Project will increase electric reliability and serve customers' growing energy needs, as well as add transmission capacity to support the development of future energy generation projects.


**Project Description**

The new Saguaro to Marana 115/138kV line would begin at the planned Adena Substation and proceed west across Interstate 19, continuing to the planned TEP substation along area located along West Marana Road between North Sanders Road and North Winder Road. This portion of the Project will be constructed as a double circuit transmission line. One circuit will be owned and operated by AEP&CO, and one circuit will be owned and operated by TEP. The AEP&CO circuit will be energized at 115kV, while the TEP circuit will be energized at 138kV. The co-location of AEP&CO and TEP assets will minimize environmental impacts and provide efficiencies in the permitting process required to build the facilities. From the approximate location of the planned TEP 138kV substation, the remainder of the line proceeding westerly to the existing AEP&CO Marana Substation will be single circuit 115kV, solely owned by AEP&CO.

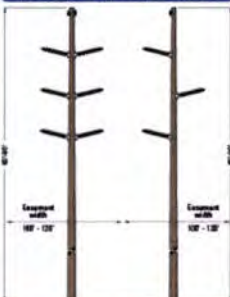
The transmission lines will utilize steel monopoles (single pole) structures typically ranging in height from 65-95 feet tall, with spans of 500-700 feet in length. Right-of-way will be approximately 100 to 120 feet and may be co-located along existing roads or other utility rights-of-way.

The Project study area, interconnection points, and preliminary route alternatives that are being studied are illustrated on the map included with this newsletter.


**Typical Double Circuit Transmission Structure**



**Proposed Transmission Structures**



115 or 138kV Double Circuit  
Target Steel Monopole



115 or 138kV Single Circuit  
Target Steel Monopole

## Planning and Permitting Process

**Project Purpose and Need** 2020

**Preliminary Engineering and Environmental Studies** 2020

**Preliminary Route Identification** 01-03 2021

**Public & Agency Outreach** 03-04 2021

**Route Selection** 04 2021-01 2022

**CEC Application and Hearings** 02 2022

The diagram to the left illustrates the key tasks and schedule that AEP&CO and TEP anticipate for the planning and permitting process. At the conclusion of the environmental and engineering studies and the public process, AEP&CO and TEP will submit an application for a Certificate of Environmental Compatibility (CEC) to the Arizona Power Plant and Transmission Line Siting Committee. The Siting Committee will review the application and hear the evidence from the Study Team and any stakeholders participating in the process. This hearing is open to the public, and there will be time allocated for public comments. If the Siting Committee supports the application, they will recommend issuing a CEC and forward it to the Arizona Corporation Commission for final approval.

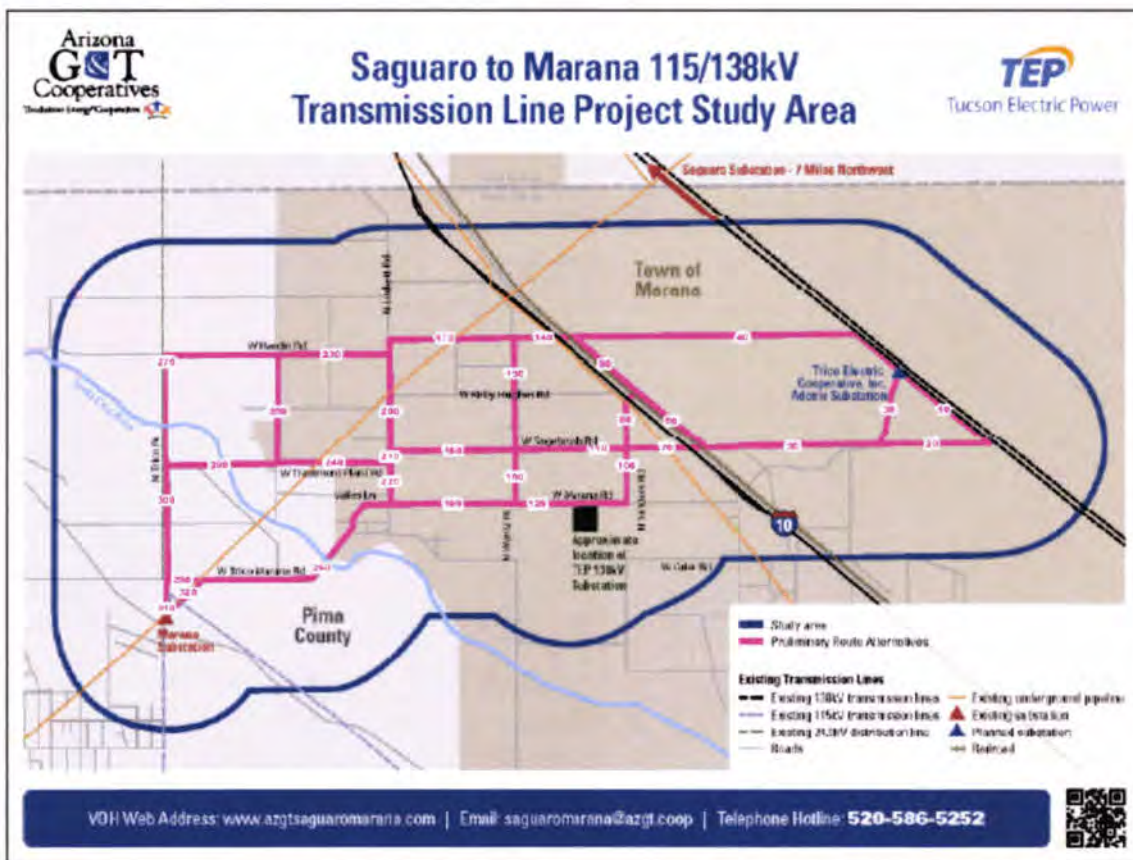
**We Value Your Input**



An important component of our planning and permitting process is to receive and consider input from residents, property owners, and businesses within the study area. Members of the community and all interested parties are invited to visit our virtual open house at any time online at [www.azgsaguaronarana.com](http://www.azgsaguaronarana.com) to learn more about the purpose and need for the Project, the siting process, environmental engineering studies, and preliminary route alternatives. We are specifically asking members of communities within the study area to identify issues that are important to them with respect to the proposed transmission line, as well as local preferences for the preliminary route alternatives considered for the Project, as shown on the map.

Your input will help AEP&CO and TEP make decisions regarding the proposed transmission lines. You will be able to provide input via a public comment form on the virtual open house website, email, or telephone hotline. We invite you to reach out to us using the contact information below or scan the QR code using your smartphone to take you directly to the virtual open house website.

[www.azgsaguaronarana.com](http://www.azgsaguaronarana.com)
[saguaronarana@azgt.coop](mailto:saguaronarana@azgt.coop)
Telephone Hotline: 520-586-5252



## Social Media

Following the mailing of the newsletter a series of seven Facebook ads were released to targeted geographical areas in the Project study area, notifying the public of the Project virtual open house website and the opportunity to learn more and provide comments on the Project. Each of the seven ads contained the same verbiage and imagery as shown below.



The performance of these ads was tracked throughout this phase of engagement and can be seen below with a guide defining some of the relevant terms. For the first week, all ads were run using Facebook's "Reach" approach which aims to get the ad onto people's feed more often. Following that week, the Project team shifted the strategy to use Facebook's "Engagement" approach, which aims to get people to interact with the ad.

Impressions – The number of times an ad was viewed on a user's Facebook feed

Unique Impressions – The number of users who see an ad in the defined time period

Clicks – The number of times an ad was clicked by a user

Engagement – The number of times a user reacted, commented, and/or shared an ad

Ad Metrics	Impressions	Unique Impressions	Clicks	Engagement
Jan. 31 – Feb 6	21,364	20,492	38	29
Feb. 7 – 13	3,166	2,525	20	61
Feb. 14 – 20	4,045	2,687	133	83
Feb. 21 – 27	5,013	3,259	159	75
Feb. 28 – March 6	5,097	3,158	121	65

### **Website Metrics**

The website at [www.azgtsaguaronarana.com](http://www.azgtsaguaronarana.com) launched on January 4, 2022. During this public engagement period, we checked available data on website activity weekly. From the launch of the site to the end of this public engagement period on March 9, 2022, 237 users visited the website. On average, a user spent one minute and 50 seconds on the website. Of those users, 226 users were located in the United States and 113 (50 percent) of those users came from Arizona based on IP address tracking. Throughout this public engagement period users accessed the site in a variety of ways:

- 95 users visited the site via Facebook
- 82 users visited the site via QR code or typing in the URL to an internet browser
- 48 users were referred to the site via websites owned by UNS Energy Corporation/Tucson Electric Power, and Arizona G&T Cooperatives
- 13 users visited the site through other means that could not be determined by the analytics program

AZG&T Cooperatives (<https://www.azgt.coop/>), Trico Electric Cooperative (<https://www.trico.coop/>), Tucson Electric Power (<https://www.tep.com/>), and the Town of Marana (<https://www.maranaaz.gov/>) posted information about the project on their respective websites. You can view images of those postings following Exhibit J.

### **Government Agency Engagement**

On February 24, 2022, the project team conversed with the Arizona Department of Transportation via email regarding the project's potential crossing of Interstate 10. Please see the exchange copied below.

Date	Sender	Recipient	Message
February 24, 2022	William Wells, Land Services Administrator, AZG&T	[REDACTED], Assistant District Engineer, Arizona Department of Transportation	Mr. [REDACTED], Arizona Electric Power Cooperative, Inc. (AEP CO) and Tucson Electric Power (TEP) are currently involved in the planning process for a joint project known as the Saguaro to Marana 115/138kV Transmission Line Project. The attached newsletter provides an overview of the Project for your reference. Also attached is an aerial map that identifies three potential (approximate) locations at MM 235.85, MM 235.12, and MM 234.29 being considered for the aerial crossing of Interstate 10 with the double circuit 115/138kV transmission line.

			<p>The purpose of this communication is to solicit feedback from the Arizona Department of Transportation that will provide assistance in identifying potential concerns that might affect the final location for the aerial crossing of I-10 with the transmission line.</p> <p>If you have questions or would like to discuss the Project in more detail you may contact Kevin Barnes, Environmental Permitting and Land Services Manager at [REDACTED] or by email at kbarnes@azgt.coop or me at [REDACTED] or by email at wwells@azgt.coop.</p> <p>Any information you are able to provide will be greatly appreciated.</p>
February 24, 2022	Jeremy Moore, Assistant District Engineer, Arizona Department of Transportation	William Wells, Land Services Administrator, AZG&T	<p>Good Morning Mr. Wells,</p> <p>Thank you for reaching out to us. I am copying our permits supervisor and regional traffic engineer in the event they want to review and add to my comments.</p> <p>If I had to pick an ideal MM I'd think 235.12. Obviously we need to make sure we have the proper vertical clearance over I10. Also, my first thought would be to keep the poles and foundations outside the ADOT R/W. We would want an encroachment permit submitted due to crossing the interstate. Again, ideally I would like to keep the pole and foundations outside the ADOT R/W. Other than that, I am not seeing a whole lot of concerns. We don't have any roadway widenings, TIs, or TI expansion projects at this location. I hope this helps. If you have any questions please feel free to reach out to me and Michelle (ADOT permits supervisor).</p>

### **Public Comment Summary**

This summary gathers the feedback received from the public regarding the Project. There were many avenues for providing feedback during this phase of engagement, including: a survey on the virtual open house website, a Project hotline phone number, a Project email address, and a contact us form on the Project virtual open house website. No feedback was received through the contact us form.

### **Survey Responses**

This survey aimed to capture what considerations were most and least important to the public and determine preferred preliminary route alternatives. The Project team received a total of four survey responses during this phase of public engagement. All four survey respondents lived, owned property, or owned a business within the Project study area. Each survey response was submitted in January 2022. On average, the respondents spent eight minutes and 45 seconds completing the survey. See results of each question included in the survey below.

*Question 1: Your Contact Information*

All respondents submitted their personal information as requested in this question. Capturing this information allowed the Project team to track any and all future communications with these stakeholders. For the purposes of this application, we have redacted their personal information and will reference the respondents as shown below, based on the date the respondent submitted their survey.

<b>Respondents</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Response Date	January 17, 2022	January 18, 2022	January 20, 2022	January 24, 2022
Name	[REDACTED]			
Organization (if applicable)		WLB Group	Cowley Management, LLC	
Address	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Address 2				
City/State/ZIP	85653	Tucson, AZ 85710	Phoenix, AZ 85034	Marana
ZIP/Postal Code				
Email Address	[REDACTED]			
Phone Number	[REDACTED]			

*Question 2: How did you learn about this project? (please select all that apply)*

<b>Answer Choices</b>	<b>Responses</b>
Mailing	3
Internet	0
Neighbor or Friend	0
News Release	1
Internet	0
Other (please specify)	0

*Question 3: Which of the following applies to your situation? (please select all that apply)*

<b>Answer Choices</b>	<b>Responses</b>
My home is within the project area or adjacent to a potential route	2
I am a landowner in the project area or adjacent to a potential route	1
My business is within or adjacent to a potential route	1
I am within the study area but not directly affected by the project	0
Other (please specify)	1

Respondent 2 answered "Other" to Question 3 and added the following details: "Engineer for residential project directly affected."

*Question 4: The routing of a transmission line involves many considerations. From the list of routing factors below, please select the corresponding level of importance of each factor.*

<b>Routing Factors</b>	<b>Unimportant</b>	<b>Somewhat Unimportant</b>	<b>Uncertain</b>	<b>Important</b>	<b>Very Important</b>
Maximize distance from homes	0	0	0	2	2
Maximize distance from commercial/industrial facilities/businesses	1	3	0	0	0
Maximize distance from public facilities (e.g. schools, libraries, parks, churches, cemeteries, etc.)	0	1	0	2	1
Minimize crossing agricultural land	1	1	0	2	0
Minimize crossing directly through property (versus along property boundaries)	0	0	0	1	3
Minimize total length of the transmission line and number of angles (reducing the project footprint)	0	1	0	2	1
Maximize distance from historic/cultural sites	0	2	0	2	0
Maximize placement of transmission line along freeways and arterial roads	0	0	0	2	2
Maximize placement of transmission line along existing power lines and utility corridors	0	0	0	1	3
Maximize placement of transmission line along property lines (e.g., section or ½ section lines)	0	0	1	1	2

*Question 5: Do you believe the purpose and need of this transmission line has been adequately explained?*

Answer Choices	Responses
Yes	4
No	0
Uncertain	0
Uncertain (If so, what additional information would be helpful to you?)	0

*Question 6: Do you believe the scope of the project has been adequately explained?*

Answer Choices	Responses
Yes	4
No	0
Uncertain	0
Uncertain (If so, what additional information would be helpful to you?)	0

*Question 7: Do you have any concerns about any of the Preliminary Route Alternatives? If so, please state the Preliminary Route Alternative and your concern.*

Respondents	Responses
1	No, none
2	We are currently designing lots for the 841 acres north of Marana Road between Sanders and Wentz and our client is extremely concerned about the visual impacts to the lots.
3	We own roughly 350 acres of land that we hope to have developed residential. Will all these lines be overhead? Any proposed sections to go underground?
4	I have concerns of the segment route labeled 50 running directly north of the San Lucas neighborhood. It will be less than 50 yards from my home. Lots of open desert out there to push segment 50 further north.

*Question 8: Are there any of the Preliminary Route Alternatives that you prefer? If so, please state the Preliminary Route Alternative you prefer and why.*

Respondents	Responses
1	40-140-150-160-120 Avoiding areas that are planned for housing development (10, 20, 30, 50, 60, 70, and 80).  120-190-250-320 Most direct route using existing major streets and existing line path (320)
2	Down Marana Road if it is on the south side of the road
3	SKIPPED QUESTION
4	Either move segment 50 further north or reroute to eliminate segment 50 of the proposed routes. I would prefer to NOT have high tension electrical lines installed right over the wall at the north side of our subdivision. It is both a

	health hazard and an eyesore. Purposely bought in this neighborhood because it was not near any high-tension transmission lines for electrical.
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*Question 9: We want to hear from you! Please provide us with any additional comments or let us know if you would like to identify additional issues for consideration.*

Respondents	Responses
1	Please consider where downed lines can land and start fires. This has been an issue other places and many highly flammable crops are still being cultivated in Marana.
2	How can we find out when a public hearing will be held?
3	SKIPPED QUESTION
4	Please consider arguments in previous section 7 & 8 of this questionnaire. Please contact me with further info or questions/comments. Thank you.

### **Hotline Calls**

The Project hotline was available throughout this phase of public engagement and two calls were received. Personal information of caller has been redacted.

**Call 1:** [REDACTED] – Received January 18, 2022

#### **Transcript of Message**

“Hi. My name is [REDACTED]. My phone number is [REDACTED]. I live at [REDACTED]. I would like to know what this red line is that touches my property line just west of the number 50. The number 50 is on the red line. Please explain to me what you're doing along my property line. Thank you.”

Travis Levitt with Burns & McDonnell responded to [REDACTED]'s call on January 20, 2022 and provided the following notes on the conversation:

“Mr. [REDACTED] concerned about how close it is to Mr. [REDACTED]'s house and wanted to know if there would be a road there. Travis Levitt stated that a public road is not part of the project, however there would be 100-120' easement cleared and that there would be access points for AEPCO vehicles to access the easement from time to time.”

**Call 2:** [REDACTED] (Survey Respondent 2) – Received January 19, 2022

#### **Transcript of Message**

[REDACTED] I work with the WLB Group. We're designing 800 acres for our client north of Marana Road between Wentz and Sanders. He has some concerns over the proposed project so I would like to see if there's someone, I could talk to to get some more information. Again, [REDACTED] Thank you.”

Travis Levitt with Burns & McDonnell responded to [REDACTED]'s call on January 20, 2022, but [REDACTED] did not pick up. Levitt left a voicemail requesting that [REDACTED] call Travis back. On January 21, 2022 [REDACTED] returned Levitt's call. Levitt provided the following notes on the conversation:

“Mr. [REDACTED] asked about what side of W Marana the line would be on. Travis Levitt stated that final side of the road is not determined yet but the TEP Substation siting area is south of W. Marana. Mr. [REDACTED]

also wanted to state the developer plans to take out W. Sagebrush Road between N. Wentz and N. Sanders Roads and make it a "greenway." Mr. [REDACTED] thanked Travis Levitt for the call back and Travis Levitt told Mr. [REDACTED] to call if Mr. [REDACTED] had any additional questions."

### Emails Received

Emails received at saguaromarana@azgt.coop during this public engagement period, along with associated responses are shared below.

<b>Date Received</b>	<b>Sender</b>	<b>Message</b>	<b>Response/Notes on Subsequent Correspondence</b>
January 24, 2022	[REDACTED]	<p>Good Morning,</p> <p>Thank you for your project notification. LUMEN has reviewed your utility notice dated 01/21/2022 regarding the <b>P-223557 AZ</b>   Saguaro Substation Transmission line Project - Marana AZ ("Project"). In response to your inquiry please find the enclosed drawings indicating the approximate location of the LUMEN facilities (the "Facilities").</p> <p>— <b>LUMEN Local/National</b> does not have facilities within your proposed construction area.</p> <p>— <b>LUMEN Local/National</b> has facilities within your proposed construction area. Please find the enclosed drawings indicating the location of the LUMEN facilities. Once you have completed your review, please respond back if LUMEN facilities appear to be in conflict. A LUMEN engineer will be assigned when engineering plans are ready for review.</p> <p><u><b>X</b></u> <b>LUMEN Local/National</b> facilities are under review by our LUMEN Field Engineer. For questions concerning the details of this review, please contact them directly.</p>	AEPCO decided that there was no reason to respond to the email.

		<p>Currently, the estimated completion date of review is 02/07/2022.</p> <p>— <b>LUMEN Local/National</b> is leasing facilities within your proposed construction Zone, which may have potential conflicts. Please verify that you have contacted all communications providers listed on your One Call Ticket.</p> <p>— <b>LUMEN Local/National -</b> The information provided in your initial request is insufficient to determine if the location of your proposed construction will conflict with LUMEN facilities. Please provide additional detailed location maps, drawings (PDF preferred), and description for further conflict review.</p> <p>— <b>LUMEN Local/National</b> has facilities within your proposed construction zone, but it has been determined that no relocation will be necessary. However, due to the proximity of your project to our facilities, a LUMEN representative will be required on-site when construction begins</p> <p><b>Please contact your <a href="#">State One Call</a> prior to construction service (click link for state specific requirements).</b></p> <p>Any changes or additions to the project plans or parameters should be submitted to <a href="#">Network Relocations</a> for review of potential new impacts to the LUMEN facilities. <b>Note:</b> the location(s) of facilities shown on these drawings you receive from us,</p>	
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		<p>are only approximate. LUMEN hereby disclaims any responsibility for the accuracy of this information. Please contact <a href="#">Network Relocations</a> regarding the above mentioned project if you should have any questions. Please reference the file number <b>P-223557 AZ</b> with any future communications.</p> <p>Thank you for your cooperation!</p>	
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### **MARCH-JUNE 2022 PUBLIC ENGAGEMENT (PHASE 3)**

The start of this third phase of public engagement was initiated by the selection of a proposed route, derived from the preliminary route alternatives. So far, this public engagement period is focused on notifying stakeholders of the Proposed Route, gathering feedback, and sharing details about the CEC hearing.

#### **Postcard**

A postcard was mailed on March 9, 2022, to all valid addresses of property owners and residents within 1 mile of the Proposed Route and alternative links in the Project study area. The postcard contained a map showing the Proposed Route selection and announced the dates for the Certificate for Environmental Compatibility hearing as well as opportunities for the public to be involved in the hearing process. A thumbnail of the postcard is available below and a full page version is available following Exhibit J.



## Saguaro to Marana 115/138kV Transmission Line Project



### NOTICE OF HEARING

Arizona Electric Power Cooperative, Inc. and Tucson Electric Power have completed the planning process for a new 115/138 kilovolt (kV) transmission line/substation between the planned Trico Electric Cooperative Inc. Adonis Substation and the existing Marana Substation in Marana, Arizona. We welcome feedback regarding the project anytime via our comment form on the project website listed below.

The Proposed Route shown in green on the map (see reverse side) will be requested in an application for a Certificate of Environmental Compatibility from the Arizona Corporation Commission. Public hearings for this project will be held **June 6-10, 2022**. Details regarding the time and location for the hearings will be posted on the project website listed below and announced via social media.

[www.azgtsaguaromarana.com](http://www.azgtsaguaromarana.com) | [saguaromarana@azgt.coop](mailto:saguaromarana@azgt.coop) | 520-586-5252



### Saguaro to Marana 115/138kV Transmission Line Project Proposed Route



### **Website Metrics**

The website at [www.azgtsaguaromarana.com](http://www.azgtsaguaromarana.com) launched on January 4, 2022, but at the start of this phase of public engagement updates were made to reflect the progress of the Project. Those updates include announcement of the proposed route, sharing of CEC hearing details, and removal of the survey which was no longer needed after selecting a proposed route.

During this public engagement phase we checked available data on website activity weekly. From the beginning of this public engagement phase, March 9, 2022 to April 18, 2022, the last date analytics were checked prior to submission of this application, 103 users visited the website. On average, a user spent one minute and 44 seconds on the website. Of those users, 98 users were located in the United States and 50 (51 percent) of those users came from Arizona. Throughout this public engagement period users accessed the site in a variety of ways:

- 42 users visited the site via Facebook
- 42 users visited the site via QR code or typing in the URL to an internet browser
- 14 users were referred to the site via websites owned by UNS Energy Corporation/Tucson Electric Power, and Arizona G&T Cooperatives
- 5 users visited the site via through other means that could not be determined by the analytics program

### **Social Media**

Following the mailing of the postcard the series of Facebook ads were updated, notifying the public of the Proposed Route and the CEC hearing process. These ads target geographical areas in and around the Project study area and contained the same verbiage and imagery as shown below.



Arizona G&T Cooperatives

Sponsored



The Saguaro to Marana 115/138kV transmission line project will increase electric reliability and serve customers' growing energy needs, as well as add transmission capacity to support the development of future energy generation projects. A proposed route has been selected and public hearings are scheduled for June 6-10, 2022.

Please visit our virtual open house at <https://www.azgtsaguaromarana.com> to learn about the purpose and need for the project, the siting process, environmental/engineering studies, the proposed route and information for the upcoming hearings. We will update the website in the next two weeks, once details are confirmed.



PUBLIC HEARINGS SCHEDULED

18

3 Comments 4 Shares



Like



Comment



Share

The performance of these ads was tracked throughout this phase of engagement and can be seen below with a guide defining some of the relevant terms. For the first week, all ads were run using Facebook's "Reach" approach which aims to get the ad onto people's feed more often. Following that week, the Project team shifted the strategy to use Facebook's "Engagement" approach, which aims to get people to interact with the ad.

Impressions – The number of times an ad was viewed on a user's Facebook feed

Unique Impressions – The number of users who see an ad in the defined time period

Clicks – The number of times an ad was tapped on or clicked by a user

Engagement – The number of times a user reacted, commented, and/or shared an ad

Ad Metrics	Impressions	Unique Impressions	Clicks	Engagement
March 7 – 13	5,370	3,292	135	75
March 14 – 20	4,866	2,987	102	62
March 21 – 31	7,169	4,113	149	86
March 30 – April 3	2,748	2,417	320	157
April 4 – 6	3,086	2,789	307	117
April 7 – 10	4,020	3,684	409	161
April 11 – 14	4,345	3,994	273	123

### **Public Comment Summary**

This summary gathers the feedback received from the public regarding the Project. The survey soliciting feedback on the preliminary route alternatives was closed after the selection of a proposed route. However, other avenues of providing feedback during this phase of engagement remained open, including: a project hotline phone number, a project email address, and a contact us form on the project virtual open house website. No feedback was received through the contact us form.

### **Hotline Calls**

The Project hotline was available throughout this second public engagement period and one call was received.

**Call 1:** [REDACTED] – Received March 11, 2022

Transcript of Message

“Yes, hi. My name is [REDACTED]. My phone number is [REDACTED] and my address is [REDACTED] in Marana. I just have a question about the line you guys are proposing. Just wondering if that does mean we will have any other option beside Trico to be our electric provider. Let me know. Thank you. Goodbye.”

Travis Levitt returned the call and left a message stating that this project will not provide an alternative provider to Trico Electric Cooperative.

### **Emails Received**

No emails were received at saguromarana@azgt.coop during this public engagement period.

*Newsletter and Postcard*

*Phase 2*

# Saguaro to Marana 115/138kV Transmission Line Project

Este boletín está disponible en español en el sitio web



## Project Purpose and Need

Arizona Electric Power Cooperative Inc. (AEPCO) and Tucson Electric Power (TEP) are planning new electrical infrastructure to serve the town of Marana, Arizona and the surrounding area.

The Saguaro to Marana Project planning process is being conducted for AEPCO to construct a new 115 kilovolt (kV) transmission line between the planned Trico Electric Cooperative Inc. Adonis Substation and existing Marana Substation. The Project will connect to the existing Saguaro Substation located approximately 7 miles northwest of Marana using an existing transmission line. TEP has identified the need for a new 138kV substation within the town of Marana. TEP will need a 138kV transmission line to provide power to this substation.

The Project will increase electric reliability and serve customers' growing energy needs, as well as add transmission capacity to support the development of future energy generation projects.

## Project Description

The new Saguaro to Marana 115/138kV line would begin at the planned Adonis Substation and proceed west across Interstate 10, continuing to the planned TEP substation siting area located along West Marana Road between North Sanders Road and North Wentz Road. This portion of the Project will be constructed as a double circuit transmission line. One circuit will be owned and operated by AEPCO, and one circuit will be owned and operated by TEP. The AEPCO circuit will be energized at 115kV, while the TEP circuit will be energized at 138kV. The co-location of AEPCO and TEP assets will minimize environmental impacts and provide efficiencies in the permitting processes required to build the facilities. From the approximate location of the planned TEP 138kV substation, the remainder of the line proceeding westerly to the existing AEPCO Marana Substation will be single-circuit 115kV, solely owned by AEPCO.

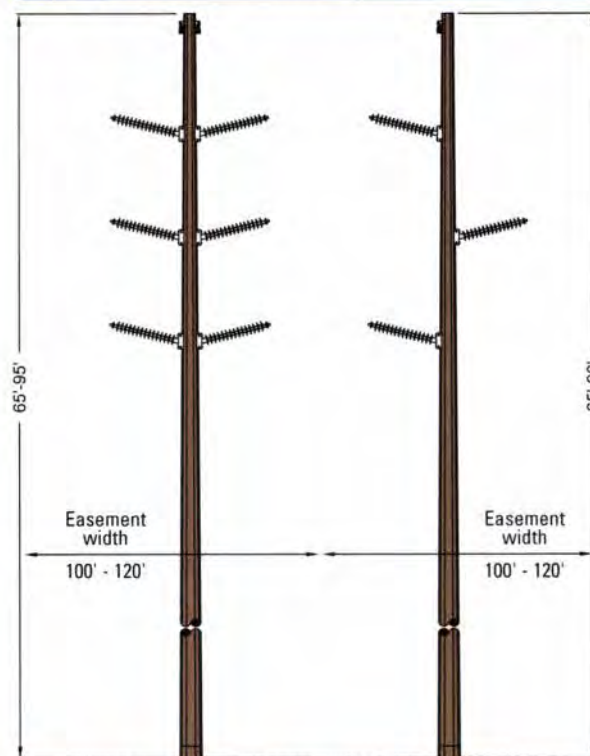
The transmission lines will utilize steel monopole (single pole) structures typically ranging in height from 65-95 feet tall, with spans of 500-700 feet in length. Right-of-way will be approximately 100 to 120 feet and may be co-located along existing roads or other utility rights-of-way.

The Project study area, interconnection points, and preliminary route alternatives that are being studied are illustrated on the map included with this newsletter.

## Typical Double Circuit Transmission Structure



## Proposed Transmission Structures



115 or 138kV **Double Circuit**  
Tangent Steel Monopole

115 or 138kV **Single Circuit**  
Tangent Steel Monopole

## Planning and Permitting Process



The diagram to the left illustrates the key tasks and schedule that AEPCO and TEP anticipate for the planning and permitting process. At the conclusion of the environmental and engineering studies and the public process, AEPCO and TEP will submit an application for a Certificate of Environmental Compatibility (CEC) to the Arizona Power Plant and Transmission Line Siting Committee. The Siting Committee will review the application and hear the evidence from the Study Team and any stakeholders participating in the process. This hearing is open to the public, and there will be time allocated for public comments. If the Siting Committee supports the application, they will recommend issuing a CEC and forward it to the Arizona Corporation Commission for final approval.

## We Value Your Input



An important component of our planning and permitting process is to receive and consider input from residents, property owners, and businesses within the study area. Members of the community and all interested parties are invited to visit our virtual open house at any time online at [www.azgtsaguaromarana.com](http://www.azgtsaguaromarana.com) to learn more about the purpose and need for the Project, the siting process, environmental/engineering studies, and preliminary route alternatives. We are specifically asking members of communities within the study area to identify issues that are important to them with respect to the proposed transmission lines, as well locational preferences for the preliminary route alternatives considered for the Project, as shown on the map.

Your input will help AEPCO and TEP make decisions regarding the proposed transmission lines. You will be able to provide input via a public comment form on the virtual open house website, emails, or telephone hotline. We invite you to reach out to us using the contact information below or scan the QR code using your smartphone to take you directly to the virtual open house website.



[www.azgtsaguaromarana.com](http://www.azgtsaguaromarana.com)



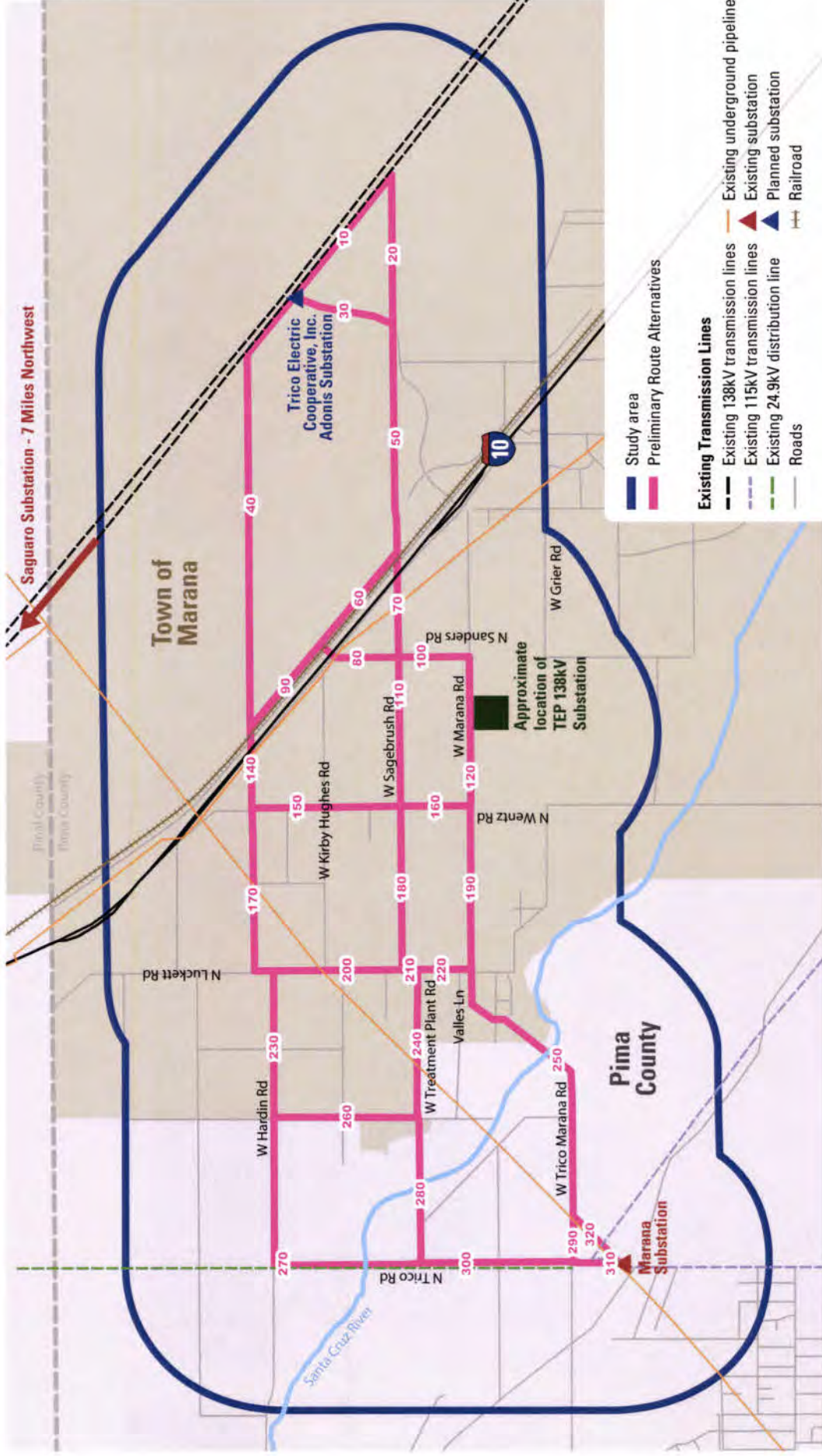
[saguaromarana@azgt.coop](mailto:saguaromarana@azgt.coop)



Telephone Hotline:  
**520-586-5252**



# Saguaro to Marana 115/138kV Transmission Line Project Study Area



*Phase 3*



# Saguaro to Marana 115/138kV Transmission Line Project



## NOTICE OF HEARING

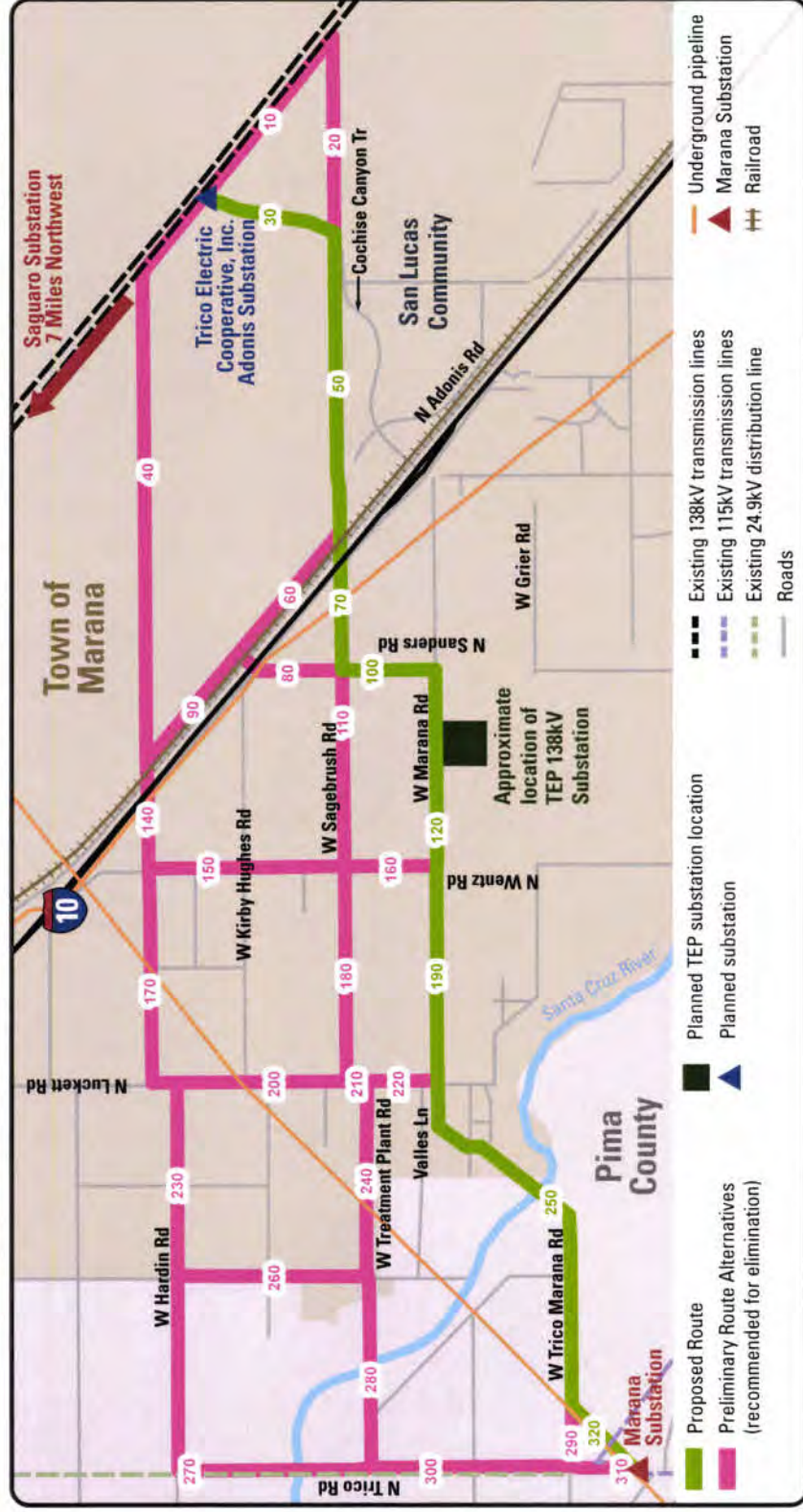
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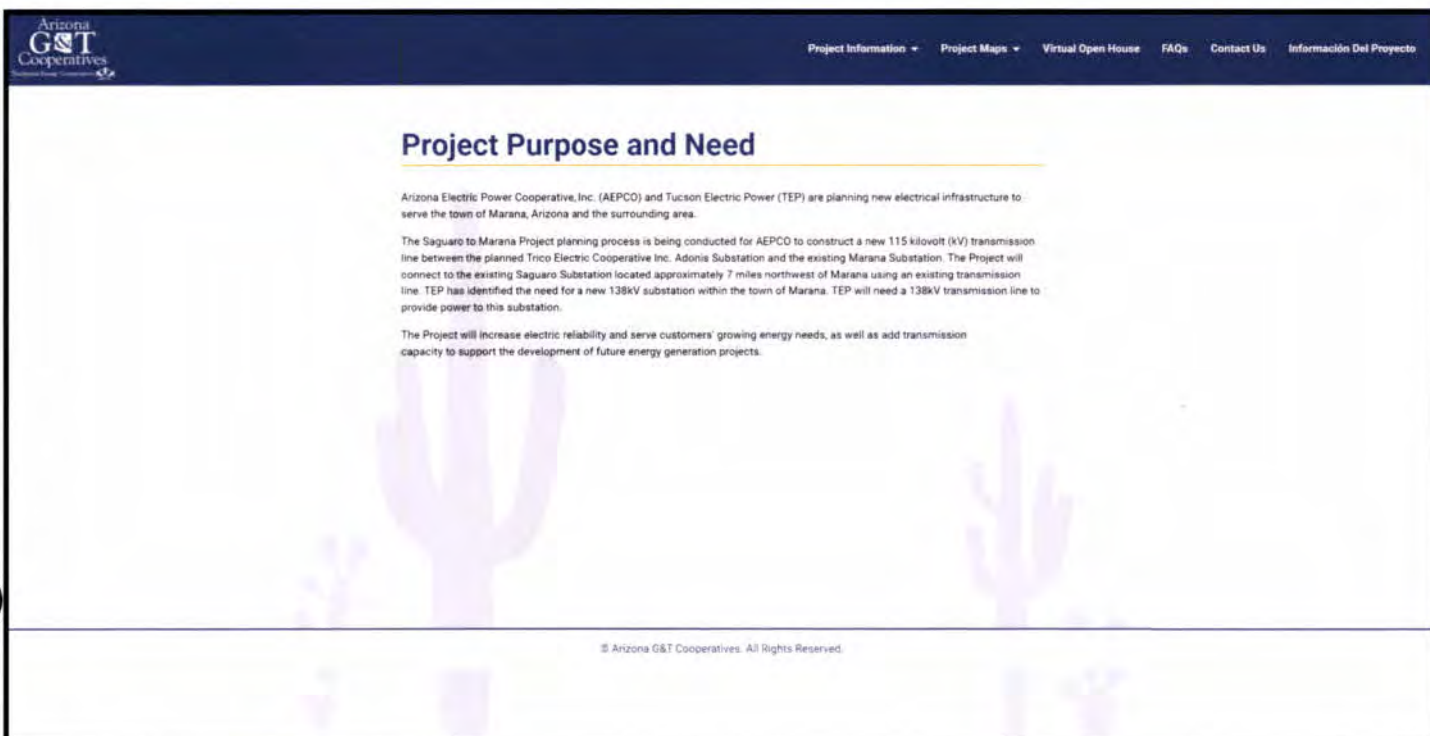
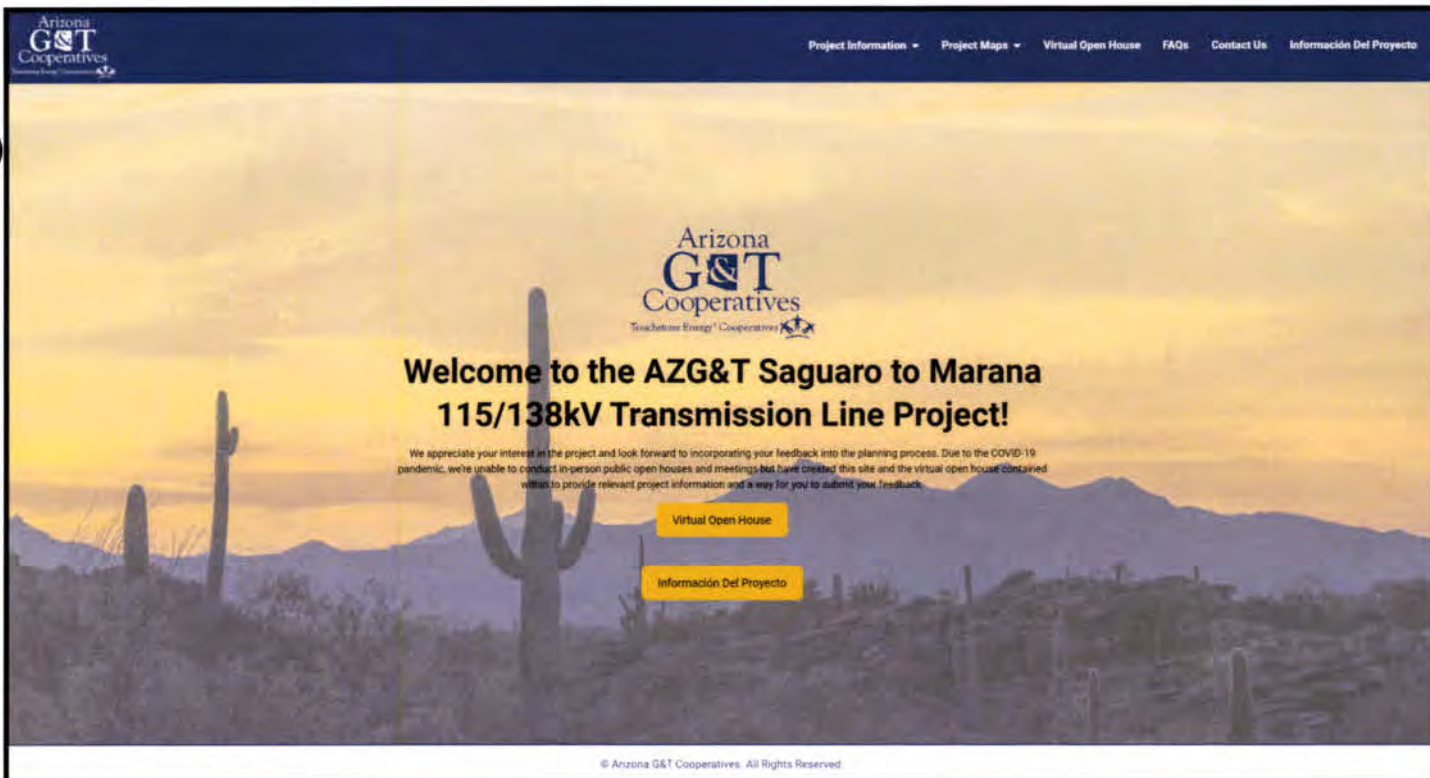


# Saguaro to Marana 115/138kV Transmission Line Project Proposed Route



*Virtual Open House Website Content*

*Phase 2*



## Project Description

The new Saguaro to Marana 115/138kV line would begin at the planned Trico Electric Cooperative Inc. Adonis Substation and proceed west across Interstate 10, continuing to the planned Tucson Electric Power (TEP) substation siting area located along West Marana Road between North Sanders Road and North Wertz Road. This portion of the Project will be constructed as a double circuit transmission line. One circuit will be owned and operated by Arizona Electric Power Cooperative, Inc. (AEP/CO), and one circuit will be owned and operated by TEP. The AEP/CO circuit will be energized at 115kV, while the TEP circuit will be energized at 138kV. The co-location of AEP/CO and TEP assets will minimize environmental impacts and provide efficiencies in the permitting processes required to build the facilities. From the approximate location of the planned TEP 138kV substation, the remainder of the line proceeding westerly to the existing AEP/CO Marana Substation along West Marana Road to the existing AEP/CO Marana Substation will be single-circuit 115kV, solely owned by AEP/CO.

The transmission lines will utilize steel monopole (single pole) structures ranging in height from 65-95 feet tall, with spans of 500-700 feet in length. Right-of-way will be approximately 100 to 120 feet and may be co-located along existing roads or other utility rights-of-way.

The Project study area, interconnection points, and preliminary route alternatives that are being studied are illustrated on the map below.



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## Project Schedule

While the time required to site transmission lines varies by project, the time frames outlined below reflect our current schedule.



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## Project Jurisdiction

To determine the criteria locations, we first identified the landowners, jurisdictions, and agencies within the Project study area to determine existing and planned land use and jurisdictional planning guidelines. Cities, towns, and counties in the study area typically have long-term plans that consider potential expansion of their current jurisdictional boundaries. These broader jurisdictional planning areas are reflected in officially adopted General Plans or Comprehensive Plans and identify desired future land use plans, including residential, commercial, industrial, recreational, educational, etc. uses to be considered for development within the community. These jurisdictional planning areas are important to consider when planning new electrical infrastructure, such as the proposed 115kV transmission lines. The following map shows the land ownership and jurisdictional boundaries within the study area.



## Project Study Area

The study area was identified by the engineering and planning team based on an evaluation of preliminary electrical system requirements and land use data. The study area includes lands approximately 1 mile beyond North Trico Road on the west, West Hardin Road on the north, existing 138/115kV transmission lines on the east, and West Marana Road/West Trico Marana Road on the south. This broader study area will allow the team to evaluate environmental resources in the vicinity of the proposed 138/115kV transmission lines and substation.





## Welcome to the AZG&T Saguaro-Marana 115/138kV Transmission Line Project Virtual Open House!

**We appreciate your interest in the Project and look forward to incorporating your feedback into the planning process.**

As you scroll down this page, you'll be able to review the subject matter stations that would be provided at an in-person project open house.

When you've completed the Virtual Open House, you'll find a link to our online Project Questionnaire. This questionnaire provides an opportunity for the community to share important information that will be considered by Arizona Electric Power Cooperative, Inc. (AEP) when making decisions regarding the design and location of the proposed project facilities. At any point during the Virtual Open House, feel free to click on the "Contact Us" menu link at the top and click on the "Project Questionnaire" button to provide your thoughts and questions.

If you would like to communicate directly with a project representative, use the "Contact Us" page to provide your questions and contact information so that we can respond to your inquiry.

**Scroll Down to Enter the Open House!**

### Station One: Project Purpose and Need

Arizona Electric Power Cooperative, Inc. (AEP) and Tucson Electric Power (TEP) are planning new electrical infrastructure to serve the town of Marana, Arizona and the surrounding area.

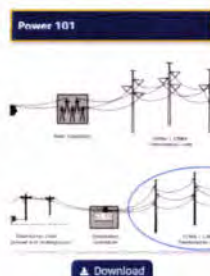
The Saguaro to Marana Project planning process is being conducted for AEP to construct a new 115 kilovolt (kV) transmission line between the planned Trinco Electric Cooperative Inc. Adonis Substation and the existing Marana Substation. The Project will connect to the existing Saguaro Substation located approximately 7 miles northwest of Marana using an existing transmission line. TEP has identified the need for a new 138kV substation within the town of Marana. TEP will need a 138kV transmission line to provide power to this substation.

The Project will increase electric reliability and serve customers' growing energy needs, as well as add transmission capacity to support the development of future energy generation projects.



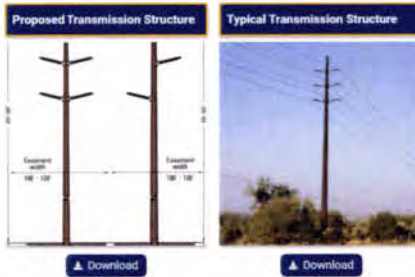
### Energy 101

In today's world, electricity is manufactured in many ways, from large-scale remote power plants all the way to local small-scale renewable energy sources. However, the bulk of electricity, no matter where it is generated, travels over long distances through a system of transmission and distribution lines that carry the electricity to where it is needed and substations that convert the voltage to an amount usable by a specific customer. This diagram gives an approximation of the path that electricity takes between where it is manufactured and a typical customer. This project primarily consists of siting new 115kV transmission lines shown circled in blue on the diagrams below.



## Project Features

Steel monopole (single pole) structures are typically used for new 115kV transmission lines but may include a variety of structure types, ranging in height from approximately 45 feet to 95 feet tall depending on routing, terrain, and crossing of existing structures, including elevated roads, riverbeds, and other transmission lines. The typical rights-of-way or easements will be approximately 100 to 120 feet wide. Any opportunity to utilize existing transmission line routes for the new 115kV structures will be considered.



## Project Schedule

AZGAT has been evaluating the need for this project for the last 18 months. There have been several engineering and environmental technical studies completed for the project to determine the type of facilities needed and the general area where the facilities will be located. The planning process being conducted now will take approximately 6 to 12 months and will be completed in sequential steps as illustrated in the schedule diagram below.



Up Next: Planning Process

## Station Two: Planning Process

AZGAT considers several factors in detail prior to making decisions related to constructing and operating new transmission lines and substations. There are detailed engineering and environmental studies that are completed during the planning process. Throughout the planning process, AZGAT will also collect input from key agencies and the public (e.g., landowners, residents, business owners, etc.) prior to selecting final locations for the proposed facilities. The information provided below will help the community understand the important data that will be evaluated during the planning process.



Download

### Land Ownership and Jurisdiction

To determine the criteria locations, we first identified the landowners, jurisdictions, and agencies within the Project study area to determine existing and planned land use and jurisdictional planning guidelines. Cities, towns, and counties in the study area typically have long-term plans that consider potential expansion of their current jurisdictional boundaries. These broader jurisdictional planning areas are reflected in officially adopted General Plans or Comprehensive Plans and identify desired future land use plans including residential, commercial, industrial, recreational, educational, etc. uses that are to be considered for development within the community. These jurisdictional planning areas are important to consider when planning new electrical infrastructure such as the proposed 115kV transmission lines. The following map shows the land ownership and jurisdictional boundaries within the study area.



Download

### Siting Criteria

Multiple studies have been conducted to help us identify areas that better lend themselves to accommodate this transmission line (opportunities), and locations that would be less accommodating for the transmission line (constraints). The criteria shown in the Opportunities and Constraints chart helps us identify route opportunities for the construction, operation, and maintenance of the new 115kV transmission lines and minimize impacts of the line to residences or other sensitive areas. For example, an arterial roadway would be considered a high ranking opportunity to locate the new transmission line. However, that same arterial road would rank lower in a residential community (an area of high constraints) than it would within a commercial zone (an area of moderate constraint). The criteria used in identifying locations of opportunity and constraints include the following:

Table 1

A table with multiple columns and rows, showing various criteria and their corresponding values. The table is color-coded with red, yellow, and green.

Download

Table 2

A table with multiple columns and rows, showing various criteria and their corresponding values. The table is color-coded with red, yellow, and green.

Download

Table 3

A table with multiple columns and rows, showing various criteria and their corresponding values. The table is color-coded with red, yellow, and green.

Download

### Existing Land Use

Land use information provided to us by the various agencies and jurisdictions allowed us to create the Existing Land Use map below to help us further determine current areas of opportunities and constraints.



Download

## Planned Land Use

Information regarding planned land use was also provided to help us determine the best locations for our facilities as shown in the Planned Land Use map below.



## Station Three: Route Alternatives

### Opportunities and Constraints

Existing and planned land use and visual resources data were used to identify areas that are most suitable for construction of the proposed 115kV transmission lines. The map below illustrates a composite of all the opportunities and constraints within the Project study area. Opportunity areas including following existing transmission lines and major roadways are shown in blue. Areas with low sensitivity including industrial or undeveloped areas are shown in green, areas with moderate sensitivity such as commercial areas or business parks are shown in yellow, and areas with high sensitivity such as residential areas are shown in red. This initial analysis helped determine:

- Locations that minimize impacts to sensitive resource areas (e.g., existing residences, schools, etc.)
- Locations that maximize the use of existing siting opportunities (e.g., existing transmission lines, roads, canals, etc.)



## Alternative Routes

The opportunity alignments along existing transmission lines and major roadways were evaluated with respect to the constraints associated with the underlying existing and planned land uses to identify preliminary alternatives for routing the proposed transmission lines. Additional siting considerations including constructability, engineering, and other technical factors were also evaluated. This map shows several preliminary alternative links that could be used to create routes that will connect the substations needed to serve customers. Some of the preliminary alternative links may be eliminated or new links may be added based upon further studies and comments received by the agencies and public as the planning process progresses.



The following Interactive Map uses geographic information system (GIS) technology to allow the agencies and public to view the project interactively. Each of the preliminary alternative links that are being considered for transmission line routes can be viewed on aerial imagery illustrating the existing landscape within the study area. Please note, these preliminary link alternatives are only conceptual and do not represent final locations or design.

[Interactive Map](#)

## Siting Considerations


When siting new electrical facilities, AZG&T strives to:

- Minimize impacts to sensitive resource areas, including residential developments, cultural sites, wildlife and avian habitat, airports, etc.; and
- Maximize use of siting opportunities, including locating near existing linear features and/or compatible land uses such as transmission lines, roads, canals, substations, etc.

Numerous considerations are in play when siting electrical facilities, as identified below:



**Up Next: Agency and Public Outreach**



## Up Next: Agency and Public Outreach

### Station Four: Agency and Public Outreach

AZG&T has been conducting extensive agency and public outreach for all of its major transmission line and substation projects for more than two decades. Input from the agencies and public is critical to the success of each new project we propose to construct and operate to serve our customers. The information provided below will help the community understand how they can participate in the planning process, which includes proposed outreach activities, registration for a live town hall meeting, the project questionnaire, and additional ways to contact AZG&T with your important comments.

Now that you've attended our virtual open house, we'd appreciate your feedback. Our project questionnaire is designed to give you the opportunity to identify the routing factors and considerations you feel are most important. Questionnaire results will be reviewed by the project team prior to the selection of a preferred route.

[Project Questionnaire](#)

Got questions? Check out our [Frequently Asked Questions \(FAQs\)](#) page.

[FAQs Page](#)

If you don't find your specific question, please use the "Contact Us" link to submit your inquiry to the project team.

[Contact Us](#)

If you'd like this information to go, use the link below to download and print our project newsletter.

[January 2022 Newsletter](#)

[Enero 2022 Boletín Informativo del Proyecto](#)

If you would like to contact us via email or telephone, please use the following information.

Email: [saguaronarizona@azgt.coop](mailto:saguaronarizona@azgt.coop)

Message Hotline: (520) 566-5252

## FAQs

### Who is Arizona Electric Power Cooperative, Inc./Arizona Generation & Transmission Cooperative?

Arizona Generation & Transmission's Cooperatives (AZG&T), of Arizona Electric Power Cooperative, Inc. (AEP/CO) is a not-for-profit transmission cooperative owned by six Class A members. These Class A members are non-profit distribution cooperatives that deliver power at retail to rural areas of Arizona and other parts of the Southwest. AEP/CO transmits power to members primarily from AEP/CO's Apache Generating Station, located near Cochise, Arizona.

### What is the Saguaro to Marana 115/138kV Transmission Line Project?

AEP/CO and Tucson Electric Power (TEP) are planning new electrical infrastructure to serve the town of Marana, Arizona and the surrounding area in Pima County. The Project consists of two separate transmission line projects, which may be built on the same structures in select areas. The Project requires:

- A new AEP/CO 115 kilovolt (kV) transmission line between the planned Trico Electric Cooperative Inc. Adonis Substation and existing AEP/CO Marana Substation. The Project will connect to the existing Saguaro Substation located approximately 7 miles northwest of Marana using an existing transmission line.
- A new TEP 138kV transmission line connecting to a planned TEP substation in the Town of Marana near the intersection of Grier Road and Sanders Road.

### Why is this transmission line project necessary?

The Project will increase electric reliability and serve customers' growing needs in the surrounding Project area. Although both utilities have the necessary infrastructure to meet current energy needs in this area, electrical demand and future growth require new 115/138 kV transmission lines/substations. The new electrical facilities may also support the development of future renewable energy generation projects as well.

### Who will this project serve?

The new facilities are intended to further our commitment to high quality, affordable, and reliable electric service for all our customers. These new facilities are needed to serve AEP/CO and TEP customers and respective service territories in the vicinity of the Town of Marana and Northeastern Pima County. This additional power capacity is needed to serve the new residential, commercial, industrial, and agricultural needs in the Marana area.

This project will bring direct and indirect benefits to individuals and the community. Providing safe and reliable electric service enables economic growth, bringing high-end jobs and revenue to the area. This project will improve the transmission infrastructure in the vicinity of the Town of Marana, which benefits economic development in the long term, including:

- The ability to better meet the growing energy needs, and increase the reliability to residents
- Help create new businesses and job opportunities
- Help sustain a larger tax base to better support the communities

### How long does it take to complete the planning and approval process for this project?

The planning and approval process of a project like this typically takes 12-18 months to complete. AEP/CO has been working on the planning process studies throughout 2021 and the Project is expected to be approved by May 2022. We are conducting the planning process, including agency and public outreach, prior to identifying preferred transmission line routes. Following the identification of preferred transmission line routes, we will apply for a Certificate of Environmental Compatibility (CEC) with the Arizona Corporation Commission (ACC) for a transmission line route corridor.

### When will these transmission lines and substations be built?

Construction of the AEP/CO 115kV transmission line is anticipated to start in the second half of 2022. TEP's 138kV transmission line and substation are anticipated to start construction in 2026.

### How many miles of new transmission lines are needed?

Approximately 9-12 miles of new transmission line are needed, depending on final routes selected to connect the planned Adonis Substation and the existing Marana Substation. The new Saguaro to Marana 115/138kV transmission line would begin at the planned Adonis Substation and proceed west across Interstate 10, continuing to the intersection of North Sanders Road and West Marana Road. This portion of the Project will be constructed as a double circuit transmission line: One circuit will be owned and operated by AEP/CO, and one circuit will be owned and operated by TEP. The AEP/CO circuit will be energized at 115kV, while the TEP circuit will be energized at 138kV. The co-location of AEP/CO and TEP assets will minimize environmental impacts and provide efficiencies in the permitting processes required to build the facilities. From North Sanders Road and West Marana Road, the remainder of the line proceeding west to the existing AEP/CO Marana Substation will be single-circuit 115kV, solely owned by AEP/CO.

### What is the size of the new transmission lines are needed?

The transmission lines will utilize steel monopole (single pole) structures ranging in height from 65-95 feet tall, with spans of 500-700 feet in length. Right-of-way will be approximately 100 to 120 feet and may be co-located along existing roadway or other utility rights-of-way.

### Can this line be constructed on existing transmission structures?

Existing transmission lines are often considered opportunities to locate new transmission lines. Although the existing structures in this area are not large enough to support the new 115/138kV transmission lines for this project, we will evaluate the opportunity to consider rebuilding existing transmission lines with larger poles that would enable us to consolidate the new 115/138kV transmission lines with the existing transmission lines.

the Town of Marana and Northeastern Pima County. This additional power capacity is needed to serve the new residential, commercial, industrial, and agricultural needs in the Marana area.

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Approximately 9-12 miles of new transmission line are needed, depending on final routes selected to connect the planned Adonis Substation and the existing Marana Substation. The new Saguro to Marana 115/138kV transmission line would begin at the planned Adonis Substation and proceed west across Interstate 10, continuing to the intersection of North Sanders Road and West Marana Road. This portion of the Project will be constructed as a double circuit transmission line. One circuit will be owned and operated by AEPCCO, and one circuit will be owned and operated by TEP. The AEPCCO circuit will be energized at 115kV while the TEP circuit will be energized at 138kV. The co-location of AEPCCO and TEP assets will minimize environmental impacts and provide efficiencies in the permitting processes required to build the facilities. From North Sanders Road and West Marana Road, the remainder of the line proceeding west to the existing AEPCCO Marana Substation will be single-circuit 115kV, solely owned by AEPCCO.

#### What is the size of the new transmission lines are needed?

The transmission lines will utilize steel monopole (single pole) structures ranging in height from 65-95 feet tall, with spans of 500-700 feet in length. Right-of-way will be approximately 100 to 120 feet and may be co-located along existing roads or other utility rights-of-way.

#### Can this line be constructed on existing transmission structures?

Existing transmission lines are often considered opportunities to locate new transmission lines. Although the existing structures in this area are not large enough to support the new 115/138kV transmission lines for this project, we will evaluate the opportunity to consider rebuilding existing transmission lines with larger poles that would enable us to consolidate the new 115/138kV transmission lines with the existing transmission lines.

#### Will you be looking for corridors both within roadway right-of-way and on private property?

The siting process will evaluate a range of alternatives that may include routes within existing roadway right-of-way, private property, or a combination of both. Prior to identifying a preferred route, AEPCCO will consider the availability of land, ownership, and cost of right-of-way in their decision process.

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Placing transmission and sub-transmission voltage transmission lines underground is significantly more expensive than placing transmission lines overhead. Actual cost differences depend on various elements, including terrain, project length, environmental concerns, labor, and material differences, etc. An overhead line that spans trenches, washes, or other difficult terrain may not be compatible for running underground and would require added time and expense for additional labor and material. Depending on the voltage and the location of the transmission line and considering the inability to be cooled by the ambient (surrounding) air as in an overhead configuration, underground transmission lines may require special technology to keep the wires cool. Underground 115/138kV transmission lines require the cable conduits to be encased in a special concrete slurry, which allows for greater heat dissipation while adding a layer of protection from accidental excavation.

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The cost of building a 115/138kV transmission line overhead can vary depending on several factors. A typical transmission line, built on flat terrain, costs approximately \$1.8 million per mile, but can increase due to terrain, geology, or other factors. The cost to build a 115/138kV transmission line underground can be 3-10 times (or more) the cost of building overhead.

## Contact Us

Arizona Electric Power Cooperative, Inc. (AEPCCO) and Tucson Electric Power (TEP) welcome your feedback for this project. We encourage you to complete our Project Questionnaire by clicking the button below. Any general comments and questions can be submitted using the form below, by phone at (520) 586-5252, or by emailing us at [saguaronarana@azgt.coop](mailto:saguaronarana@azgt.coop). If you would prefer to print and mail the Project Questionnaire, please [click here](#). Please send any printed comments to:

Saguaro to Marana 115/138kV Transmission Line Project  
1000 S Highway 80  
Benson, Arizona 85602

[Project Questionnaire](#)

Name (Required)

First

Last

Phone (Required)

Email (Required)

Comments or Questions (Optional)

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**Submit**

*Phase 3*

Arizona  
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Project Information ▾Project Maps ▾Virtual Open HouseFAQsContact UsInformación Del Proyecto

Arizona  
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Tucson Electric Power Cooperative

## Welcome to the AZG&T Saguaro to Marana 115/138kV Transmission Line Project!

We appreciate your interest in the project and look forward to incorporating your feedback into the planning process. Due to the COVID-19 pandemic, we're unable to conduct in-person public open houses and meetings but have created this site and the virtual open house contained within to provide relevant project information and a way for you to submit your feedback.

As part of our Certificate of Environmental Compatibility application process, a multi-day public hearing is scheduled for June 5-10, 2022. Details will be posted on this website to the Agency and Public Outreach station on the Virtual Open House page and on social media as they become available.

Virtual Open House

Información Del Proyecto

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Project Information ▾Project Maps ▾Virtual Open HouseFAQsContact UsInformación Del Proyecto

## Project Purpose and Need

Arizona Electric Power Cooperative, Inc. (AEP) and Tucson Electric Power (TEP) are planning new electrical infrastructure to serve the town of Marana, Arizona and the surrounding area.

The Saguaro to Marana Project planning process is being conducted for AEP to construct a new 115 kilovolt (kV) transmission line between the planned Trico Electric Cooperative Inc. Adonis Substation and the existing Marana Substation. The Project will connect to the existing Saguaro Substation located approximately 7 miles northwest of Marana using an existing transmission line. TEP has identified the need for a new 138kV substation within the town of Marana. TEP will need a 138kV transmission line to provide power to this substation.

The Project will increase electric reliability and serve customers' growing energy needs, as well as add transmission capacity to support the development of future energy generation projects.

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## Project Description

The new Saguaro to Marana 115/138kV line would begin at the planned Trico Electric Cooperative Inc. Adonis Substation and proceed west across Interstate 10, continuing to the planned Tucson Electric Power (TEP) substation siting area located along West Marana Road between North Sanders Road and North Wentz Road. This portion of the Project will be constructed as a double circuit transmission line. One circuit will be owned and operated by Arizona Electric Power Cooperative, Inc. (AEP CO), and one circuit will be owned and operated by TEP. The AEP CO circuit will be energized at 115kV, while the TEP circuit will be energized at 138kV. The co-location of AEP CO and TEP assets will minimize environmental impacts and provide efficiencies in the permitting processes required to build the facilities. From the approximate location of the planned TEP 138kV substation, the remainder of the line proceeding westerly to the existing AEP CO Marana Substation along West Marana Road to the existing AEP CO Marana Substation will be single-circuit 115kV, solely owned by AEP CO.

The transmission lines will utilize steel monopole (single pole) structures ranging in height from 65-95 feet tall, with spans of 500-700 feet in length. Right-of-way will be approximately 100 to 120 feet and may be co-located along existing roads or other utility rights-of-way.

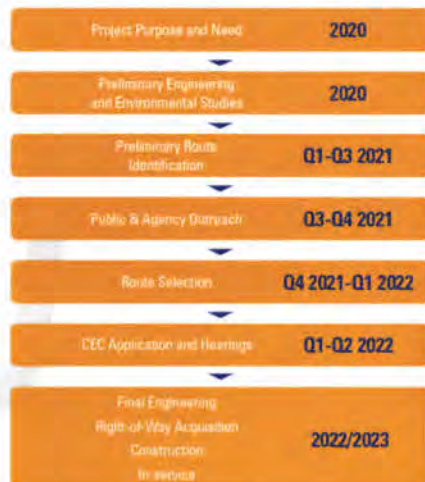
A proposed route has been selected based on routing considerations and public feedback. The proposed route, route alternatives, interconnection points, and the project study area are illustrated on the map below.



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## Project Schedule

While the time required to site transmission lines varies by project, the time frames outlined below reflect our current schedule.



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## Project Jurisdiction

To determine the criteria locations, we first identified the landowners, jurisdictions, and agencies within the Project study area to determine existing and planned land use and jurisdictional planning guidelines. Cities, towns, and counties in the study area typically have long-term plans that consider potential expansion of their current jurisdictional boundaries. These broader jurisdictional planning areas are reflected in officially adopted General Plans or Comprehensive Plans and identify desired future land use plans, including residential, commercial, industrial, recreations, educational, etc. uses to be considered for development within the community. These jurisdictional planning areas are important to consider when planning new electrical infrastructure, such as the proposed 115kV transmission lines. The following map shows the land ownership and jurisdictional boundaries within the study area.



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## Project Study Area

The study area was identified by the engineering and planning team based on an evaluation of preliminary electrical system requirements and land use data. The study area includes lands approximately 1 mile beyond North Trico Road on the west, West Hardin Road on the north, existing 138/115kV transmission lines on the east, and West Marana Road/West Trico Marana Road on the south. This broader study area allowed the team to evaluate environmental resources in the vicinity of the proposed 138/115kV transmission lines and substation.



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## Welcome to the AZG&T Saguaro-Marana 115/138kV Transmission Line Project Virtual Open House!

**We appreciate your interest in the Project and look forward to incorporating your feedback into the planning process.**

As you scroll down this page, you'll be able to review the subject matter stations that would be provided at an in-person project open house.

At any point during the Virtual Open House feel free to click on the "Contact Us" menu link at the top of the page. There you can submit feedback or reach out directly to the project team to provide your questions and contact information so that we can respond to your inquiry.

**Scroll Down to Enter the Open House!**

### Station One: Project Purpose and Need

Arizona Electric Power Cooperative, Inc. (AEP) and Tucson Electric Power (TEP) are planning new electrical infrastructure to serve the town of Marana, Arizona and the surrounding area.

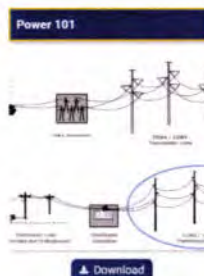
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The Project will increase electric reliability and serve customers' growing energy needs, as well as add transmission capacity to support the development of future energy generation projects.



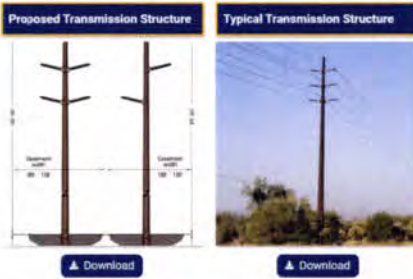
### Energy 101

In today's world, electricity is manufactured in many ways, from large-scale remote power plants all the way to local small-scale renewable energy sources. However, the bulk of electricity, no matter where it is generated, travels over long distances through a system of transmission and distribution lines that carry the electricity to where it is needed and substations that convert the voltage to an amount usable by a specific customer. This diagram gives an approximation of the path that electricity takes between where it is manufactured and a typical customer. This project primarily consists of siting new 115kV transmission lines shown circled in blue on the diagrams below.



## Project Features

Steel monopole (single pole) structures are typically used for new 115kV transmission lines but may include a variety of structure types, ranging in height from approximately 65 feet to 95 feet tall depending on routing, terrain, and crossing of existing structures, including elevated roads, riverbeds, and other transmission lines. The typical rights-of-way or easements will be approximately 100 to 120 feet wide. Any opportunity to utilize existing transmission line routes for the new 115kV structures will be considered.



## Project Schedule

AEPCC has been evaluating the need for this project for the last 18 months. There have been several engineering and environmental technical studies completed for the project to determine the type of facilities needed and the general area where the facilities will be located. The planning process being conducted now will take approximately 6 to 12 months and will be completed in sequential steps as illustrated in the schedule diagram below.



## Station Two: Planning Process

AEPD considers several factors in detail prior to making decisions related to constructing and operating new transmission lines and substations. There are detailed engineering and environmental studies that are completed during the planning process. Throughout the planning process, AEPD will also collect input from key agencies and the public (e.g., landowners, residents, business owners, etc.) prior to selecting final locations for the proposed facilities. The information provided below will help the community understand the important data that will be evaluated during the planning process.



### Land Ownership and Jurisdiction

To determine the criteria locations, we first identified the landowners, jurisdictions, and agencies within the Project study area to determine existing and planned land use and jurisdictional planning guidelines. Cities, towns, and counties in the study area typically have long-term plans that consider potential expansion of their current jurisdictional boundaries. These broader jurisdictional planning areas are reflected in officially adopted General Plans or Comprehensive Plans and identify desired future land use plans including residential, commercial, industrial, recreational, educational, etc.: uses that are to be considered for development within the community. These jurisdictional planning areas are important to consider when planning new electrical infrastructure such as the proposed 115kV transmission lines. The following map shows the land ownership and jurisdictional boundaries within the study area.



### Siting Criteria

Multiple studies have been conducted to help us identify areas that better lend themselves to accommodate this transmission line (opportunities), and locations that would be less accommodating for the transmission line (constraints). The criteria shown in the Opportunities and Constraints chart helps us identify route opportunities for the construction, operation, and maintenance of the new 115kV transmission lines and minimize impacts of the line to residences or other sensitive areas. For example, an arterial roadway would be considered a high-ranking opportunity to locate the new transmission line. However, that same arterial road would rank lower in a residential community (an area of high constraint) than it would within a commercial zone (an area of moderate constraint). The criteria used in identifying locations of opportunity and constraints include the following:

Table 1	Table 2	Table 3
<p>Table 1: Opportunities and Constraints chart. It lists various criteria such as 'Proximity to Residential Areas', 'Proximity to Commercial Areas', 'Proximity to Industrial Areas', etc., and ranks them from 'High Opportunity' (red) to 'High Constraint' (green).</p>	<p>Table 2: Opportunities and Constraints chart. It lists various criteria such as 'Proximity to Residential Areas', 'Proximity to Commercial Areas', 'Proximity to Industrial Areas', etc., and ranks them from 'High Opportunity' (red) to 'High Constraint' (green).</p>	<p>Table 3: Opportunities and Constraints chart. It lists various criteria such as 'Proximity to Residential Areas', 'Proximity to Commercial Areas', 'Proximity to Industrial Areas', etc., and ranks them from 'High Opportunity' (red) to 'High Constraint' (green).</p>
<a href="#">Download</a>	<a href="#">Download</a>	<a href="#">Download</a>

### Existing Land Use

Land use information provided to us by the various agencies and jurisdictions allowed us to create the Existing Land Use map below to help us further determine current areas of opportunities and constraints.



## Planned Land Use

Information regarding planned land use was also provided to help us determine the best locations for our facilities as shown in the Planned Land Use map below.



## Station Three: Route Alternatives

### Opportunities and Constraints

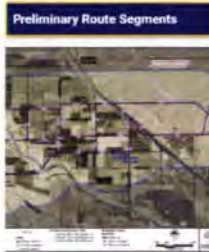
Existing and planned land use and visual resources data were used to identify areas that are most suitable for construction of the proposed 115kV transmission lines. The map below illustrates a composite of all the opportunities and constraints within the Project study area. Opportunity areas including following existing transmission lines and major roadways are shown in blue. Areas with low sensitivity including industrial or undeveloped areas are shown in green, areas with moderate sensitivity such as commercial areas or business parks are shown in yellow, and areas with high sensitivity such as residential areas are shown in red. This initial analysis helped determine:

- Locations that minimize impacts to sensitive resource areas (e.g., existing residences, schools, etc.)
- Locations that maximize the use of existing siting opportunities (e.g., existing transmission lines, roads, canals, etc.)



## Alternative Routes

The opportunity alignments along existing transmission lines and major roadways were evaluated with respect to the constraints associated with the underlying existing and planned land uses to identify preliminary alternatives for routing the proposed transmission lines. Additional siting considerations including constructability, engineering, and other technical factors were also evaluated. This map shows several preliminary alternative links that could be used to create routes that will connect the substations needed to serve customers. During the planning process, preliminary alternative links were considered, and a proposed route is being advanced based upon the route study and comments received from agencies and the public.



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## Proposed Route

AEPD has identified a proposed route from the options shown on the map above. You can view the proposed route on the map below as well as the Interactive Map.

The following Interactive Map uses geographic information system (GIS) technology to allow the agencies and public to view the project interactively. The proposed route, each of the previously considered preliminary alternative links, and the study area can be viewed on aerial imagery illustrating the existing landscape in the area. Please note, all alternatives and the proposed route are only conceptual and do not represent final locations or design.

[Interactive Map](#)



[Download](#)

## Siting Considerations

When siting new electrical facilities, AEPD strives to:

- Minimize impacts to sensitive resource areas, including residential developments, cultural sites, wildlife and avian habitat, airports, etc. and
- Maximize use of siting opportunities, including locating near existing linear features and/or compatible land uses such as transmission lines, roads, canals, substations, etc.

Numerous considerations are in play when siting electrical facilities, as identified below.



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## Station Four: Agency and Public Outreach

AEPCO has been conducting extensive agency and public outreach for all of its major transmission line and substation projects for more than two decades. Input from the agencies and public is critical to the success of each new project we propose to construct and operate to serve our customers. There is additional information on the FAQ page. You are welcome to contact the project team with any comments and questions using the "Contact Us" button below.

FAQs Page

Contact Us

If you'd like this information to go, use the link below to download and print our project newsletter or postcard.

March 2022 Postcard

January 2022 Newsletter

Enero 2022 Boletín Informativo del Proyecto

If you would like to contact us via email or telephone, please use the following information:

Email: [saguromarana@azgt.coop](mailto:saguromarana@azgt.coop)

Message Hotline: (520) 566-5332

## FAQs

### Who is Arizona Electric Power Cooperative, Inc./Arizona Generation & Transmission Cooperative?

Arizona Generation & Transmission Cooperatives (AZG&T) of Arizona Electric Power Cooperative, Inc. (AEP&CO) is a not-for-profit transmission cooperative owned by six Class A members. These Class A members are non-profit distribution cooperatives that deliver power at retail to rural areas of Arizona and other parts of the Southwest. AEP&CO transmits power to members primarily from AEP&CO's Apache Generating Station, located near Cochise, Arizona.

### What is the Saguaro to Marana 115/138kV Transmission Line Project?

AEP&CO and Tucson Electric Power (TEP) are planning new electrical infrastructure to serve the town of Marana, Arizona and the surrounding area in Pima County. The Project consists of two separate transmission line projects, which may be built on the same structures in select areas. The Project requires:

- A new AEP&CO 115 kilovolt (kV) transmission line between the planned Trico Electric Cooperative Inc. Adonis Substation and existing AEP&CO Marana Substation. The Project will connect to the existing Saguaro Substation located approximately 7 miles northwest of Marana using an existing transmission line.
- A new TEP 138kV transmission line connecting to a planned TEP substation in the Town of Marana near the intersection of Grier Road and Sanders Road.

### Why is this transmission line project necessary?

The Project will increase electric reliability and serve customers' growing needs in the surrounding Project area. Although both utilities have the necessary infrastructure to meet current energy needs in this area, electrical demand and future growth require new 115/138 kV transmission lines/substations. The new electrical facilities may also support the development of future renewable energy generation projects as well.

### Who will this project serve?

The new facilities are intended to further our commitment to high quality, affordable, and reliable electric service for all our customers. These new facilities are needed to serve AEP&CO and TEP customers and respective service territories in the vicinity of the Town of Marana and Northwestern Pima County. This additional power capacity is needed to serve the new residential, commercial, industrial, and agricultural needs in the Marana area.

This project will bring direct and indirect benefits to individuals and the community. Providing safe and reliable electric service enables economic growth, bringing high-end jobs and revenue to the area. This project will improve the transmission infrastructure in the vicinity of the Town of Marana, which benefits economic development in the long term, including:

- The ability to better meet the growing energy needs, and increase the reliability to residents
- Help create new businesses and job opportunities
- Help sustain a larger tax base to better support the communities

### How long does it take to complete the planning and approval process for this project?

The planning and approval process of a project like this typically takes 12-18 months to complete. AEP&CO has been working through the planning process in 2021 and 2022. A proposed route was selected in March 2022. We are now in the process of applying for a Certificate of Environmental Compatibility (CEC) with the Arizona Corporation Commission (ACC) for a transmission line route corridor. Public hearings for the CEC are scheduled for June 6-10, 2022. The Project is expected to be approved in June 2022.

### When will these transmission lines and substations be built?

Construction of the AEP&CO 115kV transmission line is anticipated to start in the second half of 2022. TEP's 138kV transmission line and substation are anticipated to start construction in 2026.

### How many miles of new transmission lines are needed?

Approximately 9-12 miles of new transmission line are needed, depending on final routes selected to connect the planned Adonis Substation and the existing Marana Substation. The new Saguaro to Marana 115/138kV transmission line would begin at the planned Adonis Substation and proceed west across Interstate 10, continuing to the intersection of North Sanders Road and West Marana Road. This portion of the Project will be constructed as a double circuit transmission line. One circuit will be owned and operated by AEP&CO and one circuit will be owned and operated by TEP. The AEP&CO circuit will be energized at 115kV, while the TEP circuit will be energized at 138kV. The co-location of AEP&CO and TEP assets will minimize environmental impacts and provide efficiencies in the permitting processes required to build the facilities. From North Sanders Road and West Marana Road, the remainder of the line proceeding west to the existing AEP&CO Marana Substation will be single-circuit 115kV, solely owned by AEP&CO.

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Saguaro to Marana 115/138kV Transmission Line Project  
1000 S Highway 80  
Benson, Arizona 85602

Name (Required)

First

Last

Phone (Required)

Email (Required)

Comments or Questions (Required)

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## *Stakeholder Project Notifications*



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 AzGT Gathers Public Comments While Planning Saguaro-Marana Transmission Line

## AzGT Gathers Public Comments While Planning Saguaro-Marana Transmission Line

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Growing demand prompts proposed infrastructure

For immediate release  
 February 7, 2022

Contacts: Geoff Oldfather, (520) 586-5465, C: (520) 444-3473, [goldfather@azgt.coop](mailto:goldfather@azgt.coop)  
 J.D. Wallace, (520) 586-5157, C: (520) 235-4203, [jdwallace@azgt.coop](mailto:jdwallace@azgt.coop)

BENSON – The Marana area continues to grow, requiring more infrastructure to power new homes and businesses. TriCo Electric Cooperative, a Member of Arizona G&T Cooperative (AzGT), has planned the new Adona Substation to meet new demand, but the substation needs power. AzGT plans to meet the needs with the Saguaro to Marana 115/138kV Transmission Line Project. The project requires public input before any poles are raised.

AzGT plans to purchase a transmission line that runs approximately seven miles from a neighboring utility's existing Saguaro Substation to near the proposed Adona Substation. Additionally, AzGT is planning a new transmission line from the proposed Adona Substation to AzGT's existing Marana Substation.

"The project will increase electric reliability and serve growing energy needs," said Kevin Barnes, AzGT environmental and land services manager. "It will also add transmission capacity to support future energy generation projects."

A neighboring utility is adding a substation to serve Marana, and will locate a transmission line on the same poles for a portion of the route. The project will feature steel monopole structures that range from 65 to 95 feet tall with spans of 500 to 700 feet.

"The co-location of these assets minimizes environmental impacts and provides efficiencies in the permitting process required to build the line," Barnes explained. Efficiencies include using one right-of-way for one route instead of two separate ones. The area is being studied to determine the final route. "We consider locating along existing roads and other utility rights-of-way," Barnes said. "Routes that result in the least impact while providing an efficient path."

AzGT and the partner utility must submit an application for a Certificate of Environmental Compatibility (CEC) to the Arizona Power Plant and Transmission Line Siting Committee, which will review the application and hear evidence from the study team and other stakeholders. A public hearing will likely be held in June.

Some 1,400 addresses in the affected area were mailed a newsletter that outlined the proposal and included a map of alternative transmission routes. The public can participate in a virtual open house and submit comments at the [Saguaro to Marana Transmission Line Project website](#). Learn more at the [Current Transmission Projects](#) page, call (520) 586-5252, or email [saguaronmarana@azgt.coop](mailto:saguaronmarana@azgt.coop).



[View full size map of Preliminary Route Segments \(PDF\)](#)

The siting committee will consider forwarding the CEC to the Arizona Corporation Commission for final approval.

"We want to be good neighbors and understand how we can serve the growing demand for electricity in these communities, while doing so in a way that addresses concerns," Barnes said.



[Arizona G&T Cooperatives](#) » [What We Do](#) » [Current Transmission Projects](#)

## Current Transmission Projects

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## Saguaro to Marana 115/138kV Transmission Line Project

Arizona Electric Power Cooperative, Inc. (AEP) and Tucson Electric Power (TEP) are planning new electrical infrastructure to serve the town of Marana, Arizona and the surrounding area.

## Saguaro to Marana 115/138kV Transmission Line Project Proposed Route



The attached map shows the preferred route and route alternatives for the project, which will increase electric reliability and serve customers' growing energy needs, as well as add transmission capacity to support the development of future energy generation projects.

The Saguaro to Marana Project planning process is being conducted for AEP/CO to construct a new 115 kilovolt (kV) transmission line between the planned Trico Electric Cooperative Inc. Adonis Substation and the existing Marana Substation. The project will connect to the existing Saguaro Substation located approximately seven miles northwest of Marana using an existing transmission line. TEP has identified the need for a new 138kV substation within the town of Marana. TEP will need a 138kV transmission line to provide power to this substation.

The project will increase electric reliability and serve customers' growing energy needs, as well as add transmission capacity to support the development of future energy generation projects.

For complete details please visit the [Saguaro to Marana Transmission Line Project website](http://www.saguardo-to-marana-transmission-line-project.com)

- [January 2022 Saguaro to Marana Newsletter \(PDF, 2MB\)](#)
- [March 2022 Saguaro to Marana Preferred Route Postcard \(PDF, 293KB\)](#)
- [April 2022 Saguaro to Marana Project Pre-Filing Transcript \(PDF, 207KB\)](#)

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Benson, Arizona 85602

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## Saguaro to Marana 115/138kV Transmission Line Project Proposed Route

### Saguaro to Marana 115/138kV Transmission Line Project Proposed Route



Arizona Electric Power Cooperative, Inc. and Tucson Electric Power have completed the planning process for a new 115/138 kilovolt (kV) transmission line/substation between the planned Trijo Electric Cooperative Inc. Adonis Substation and the existing Marana Substation in Marana, Arizona. They welcome feedback regarding the project anytime via our comment form on the project website below.

[Click here to view the project website.](#)

The Proposed Route shown in green on the map will be requested in an application for a Certificate of Environmental Compatibility from the Arizona Corporation Commission. Public hearings for this project will be held June 6-10, 2021. Details regarding the time and location for the hearings will be posted on the project website linked below and announced via social media.

[Click here to view the video.](#)

Please note: This is not a Town of Marana project. Please direct your feedback to the project website linked above.

Map of the project area.

COMMENTS (0)

Newest First

Preview POST COMMENT

Newer Post  
Marana Town Council recognizes and honors Town Engineer Robert Brown for his service and dedication.

Older Post  
Marana is a top-10 safe place to live in Arizona.

Main line: 520-382-1999  
Emergency: 911  
Police: 520-382-2000  
Development Services: 520-382-2600  
Animal Services: 520-382-8020  
Parks & Recreation: 520-382-1950  
Court: 520-382-2700  
Airport: 520-382-8052  
Water: 520-382-2570  
Public Works: 520-382-2536

[Department contact info](#)  
[Privacy Policy](#)

Admin hours of operation:  
Mon-Fri 8 A.M. - 5 P.M.

Cashier:  
All financial transactions occur at the first floor reception counter of the Administration building.

Main Address:  
Marana Municipal Complex  
11555 W Civic Center Drive  
Marana, AZ 85653  
[Map it!](#)



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## Notice of hearing for Saguario to Marana Transmission Line Project

Arizona Electric Power Cooperative (AEP) and Tucson Electric Power (TEP) are planning new electrical infrastructure to serve the town of Marana and the surrounding area. The Saguario to Marana Project planning process is being conducted for AEP/TEP to construct a new 115 kilovolt (kV) transmission line between Trico's planned Adonis Substation and existing Marana Substation. Visit [www.azgtsaguarmarana.com](http://www.azgtsaguarmarana.com) to learn more about the purpose and need for the Project, the siting process, environmental engineering studies, and preliminary route alternatives.



### Saguario to Marana 115/138kV Transmission Line Project



#### NOTICE OF HEARING

Arizona Electric Power Cooperative, Inc. and Tucson Electric Power have completed the planning process for a new 115/138 kilovolt (kV) transmission line/substation between the planned Trico Electric Cooperative Inc. Adonis Substation and the existing Marana Substation in Marana, Arizona. We welcome feedback regarding the project anytime via our comment form on the project website listed below.

The Proposed Route shown in green on the map (see reverse side) will be requested in an application for a Certificate of Environmental Compatibility from the Arizona Corporation Commission. Public hearings for this project will be held **June 6-10, 2022**. Details regarding the time and location for the hearings will be posted on the project website listed below and announced via social media.

[www.azgtsaguarmarana.com](http://www.azgtsaguarmarana.com) | [saguarmarana@azgt.coop](mailto:saguarmarana@azgt.coop) | 520-586-5252



#### Saguario to Marana 115/138kV Transmission Line Project Proposed Route



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#### GET IN TOUCH

MAIN: (520) 744-2944  
TOLL-FREE: (866) 337-2052  
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#### WHERE TO FIND US

Trico Electric Cooperative  
8600 W. Tangerine Rd.  
Marana, AZ 85658  
Opening Hours:  
Mon - Fri: 8:00 a.m. - 4:30 p.m.

#### MEMBER RESOURCES

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#### OUR NEWSLETTER

Sign up for LIVEWIRE, our monthly newsletter.

Enter your email address...



Touchstone Energy  
Cooperatives  
The power of human connections



## Saguaro to Marana 115/138 Kilovolt Transmission Line Project

Tucson Electric Power (TEP) and Arizona Electric Power Cooperative (AEP/CO) are planning new electrical infrastructure to serve the Town of Marana and surrounding area. The Saguaro to Marana 115/138-Kilovolt (KV) Transmission Line Project will strengthen electric reliability and add transmission capacity to serve customers' growing energy needs.

The unnamed TEP substation is planned to be in-service in 2026. This date may change depending upon energy demand within the project area.

For complete details, please visit [azgtsaguarmarana.com](http://azgtsaguarmarana.com).



- [Project Website](#)
- [Project Map](#)
- [Share your comments](#)

Project Description	+
Required Approvals and Timeline	+
Public Participation	+
Outreach Materials	+

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