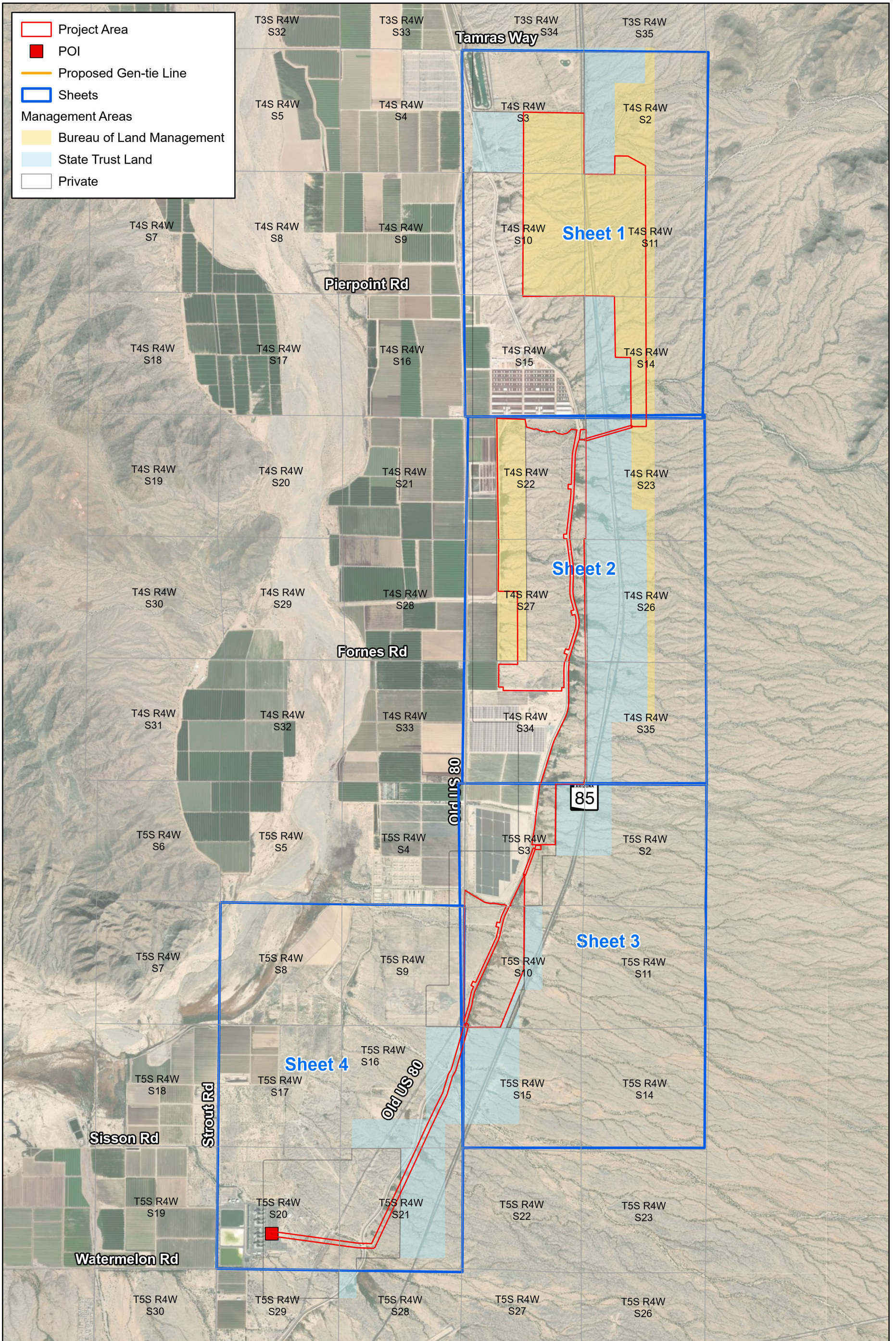


Appendix A

Project Map Book




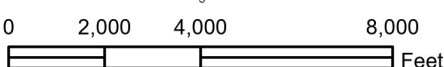
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 Proposed Gen-tie Line
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Management Areas
 Bureau of Land Management
 State Trust Land
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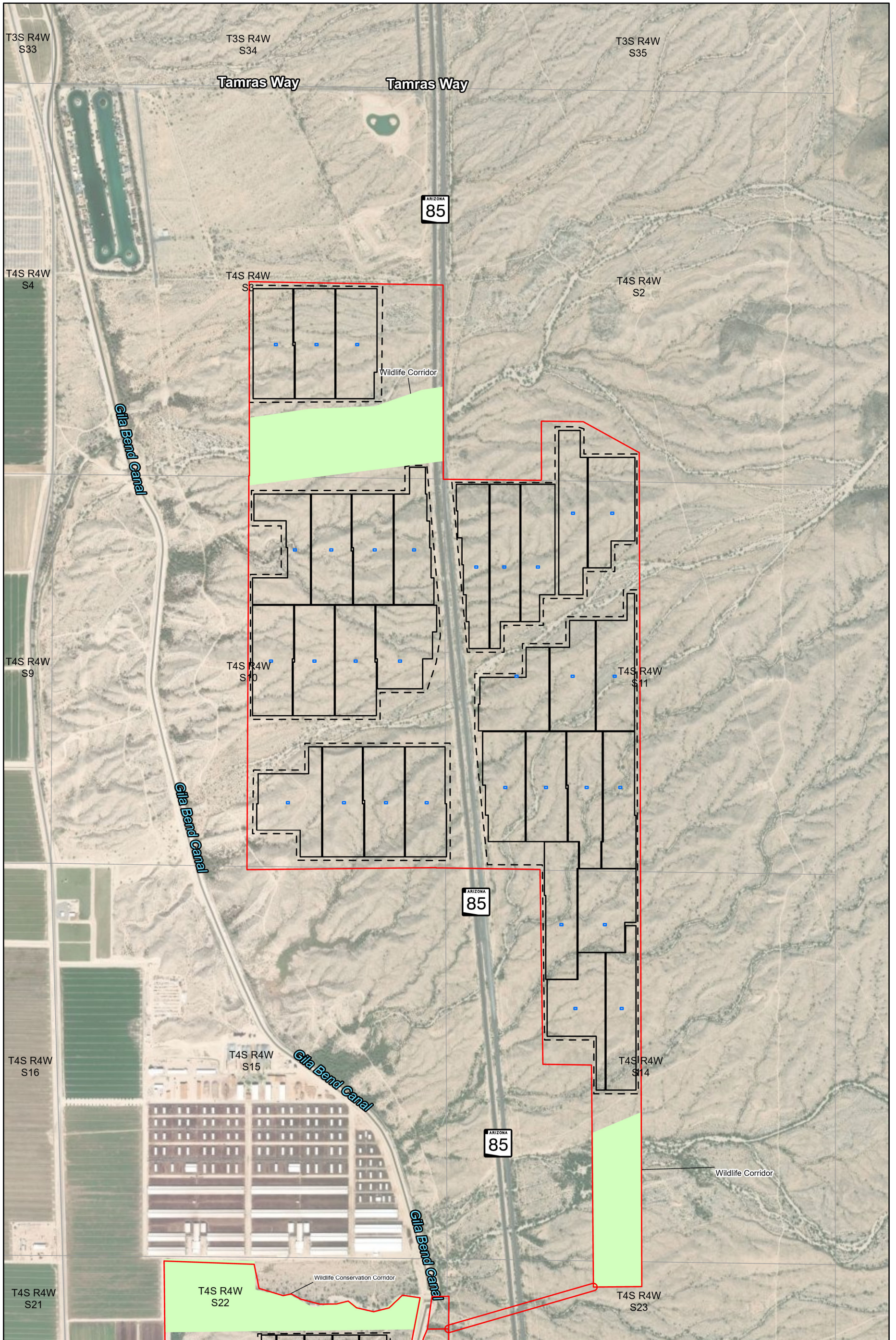
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**Preliminary Site Plan
 Index Key**

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 Ownership Source/Date: BLM, 2021; ASLD, 2022;
 and Maricopa County Assessor's Office, 2021



 Scale: 1" = 4,000'

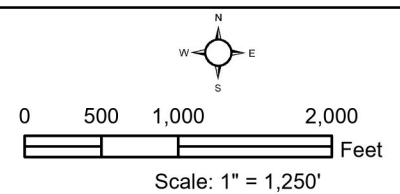


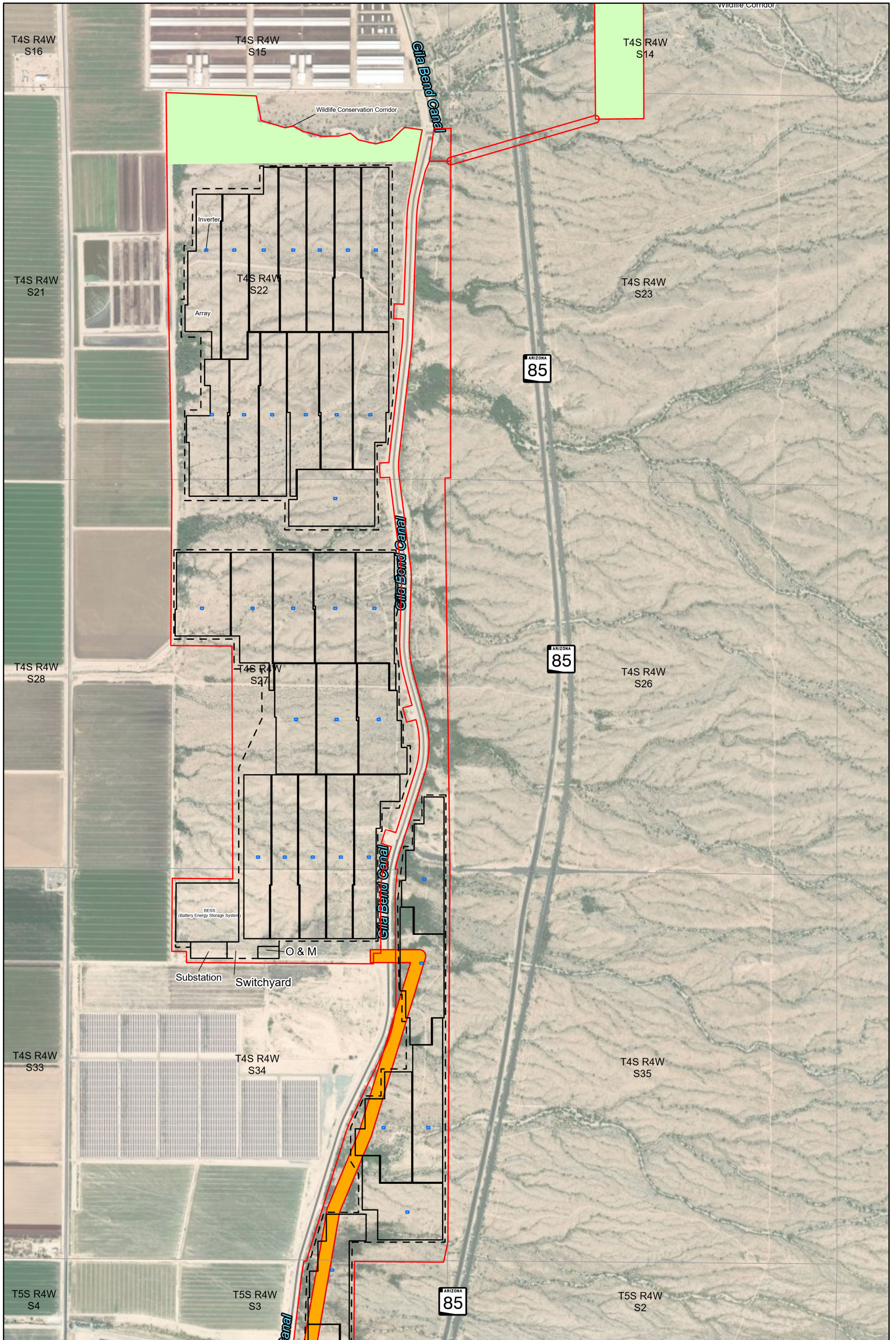
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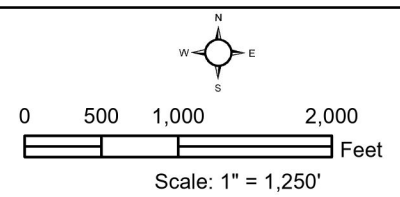


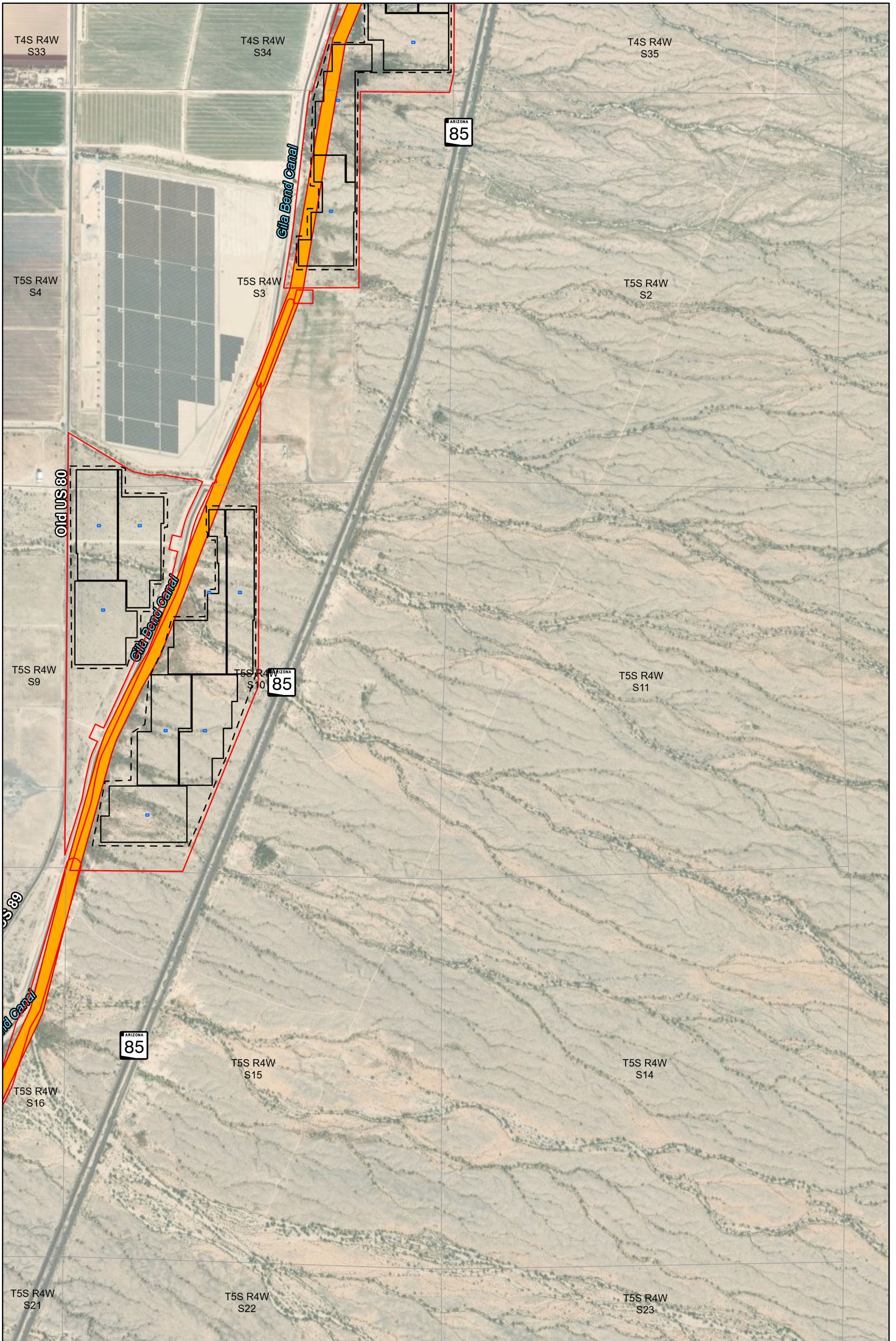


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Preliminary Site Plan
Sheet: 2 of 4

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and Maricopa County Assessor's Office, 2021

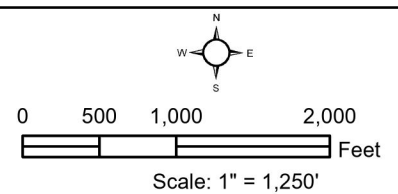




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Preliminary Site Plan
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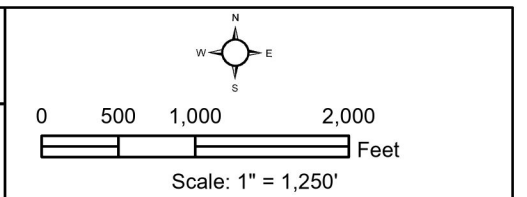
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and Maricopa County Assessor's Office, 2021



Appendix B

Plan of Development

SOUTHWEST CROSSROADS SOLAR PROJECT
Maricopa County, Arizona
PLAN OF DEVELOPMENT



Prepared for:
U.S. Bureau of Land Management
Phoenix District Office Lower
Sonoran Field Office

Prepared by:
Kimley»»Horn

On behalf of:
Southwest Crossroads Solar, LLC
A wholly owned subsidiary of Longroad Energy Holdings, LLC
330 Congress St. 6th Floor
Boston, MA 02210

July 19, 2023

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1 PROJECT OVERVIEW

1.1 Introduction

Southwest Crossroads Solar, LLC (“Applicant”), a wholly owned subsidiary of Longroad Energy Holdings, LLC, is requesting a 30-year right-of-way grant (the “ROW”) for approximately 1,189-acres to construct, operate, maintain, and decommission a portion of the Southwest Crossroads Solar Project (“Project”), a photovoltaic (PV) solar power generation facility with a battery energy storage system (BESS) proposed on approximately 2,434 acres of private, state and BLM-administered lands in Maricopa County, Arizona (Figure 1).

The Project would generate up to approximately 250 megawatts (MW) alternating current (AC) of renewable electrical energy and include an energy storage capacity of approximately 4 hours of 250 MW of AC. The Project solar generation facility would include approximately 10 individually fenced areas with photovoltaic (PV) module arrays; a battery energy storage system (BESS); a collector substation; medium voltage electrical collection lines to connect the PV module areas, BESS, and collector substation and switchyard; electrical equipment pads with inverters and transformers; a switchyard; and an operation and maintenance (O&M) building and parking area. In addition, the Project would include an approximately 5.8-mile-long 500-kV generation-tie (gen-tie) line to deliver power to the existing Gila River 500-kV Substation, which is approximately 2.5 miles southwest of the Project and is operated by the Salt River Project (SRP). The Project filed an Interconnection Request on May 5, 2022 with a proposed Point of Interconnection at the Gila River 500-kV Substation. SRP has assigned the project Queue Position Q03 in the Gila River Interconnection Queue.

The overall Project area would include approximately 2,434 acres, including areas associated with the generation facility and areas associated with gen-tie and collection line rights-of-way (ROWs). The generation facility would include approximately 2,298 acres, of which approximately 1,576 acres would be within fence lines. The gen-tie and collector line ROW easements (portions outside of the generation facility boundary) would be located on approximately 136 additional acres. The width of the collector line easements would be 100 feet, while the width of the gen-tie line easement would be 200-250 feet, with a maximum of 300 feet (300 feet was included in Table 1 for planning purposes). The Project Map Book (Appendix A) provides detailed maps of the Project. The breakdown of Project landownership is included in Table 1.

Table 1. Landownership within the Project Area

Project Component	Land Ownership	Fenced Areas	Acres
Generation Facility	BLM	796.4	1,188.6
	State	0.0	0.55
	Private	780.0	1,109.2
	Subtotal	1,576.4	2,298.35
Gen-tie/ Collection ROW	BLM	N/A	N/A
	State	N/A	56.8
	Private	N/A	78.9
	Subtotal	N/A	135.7
Total			2,434.03

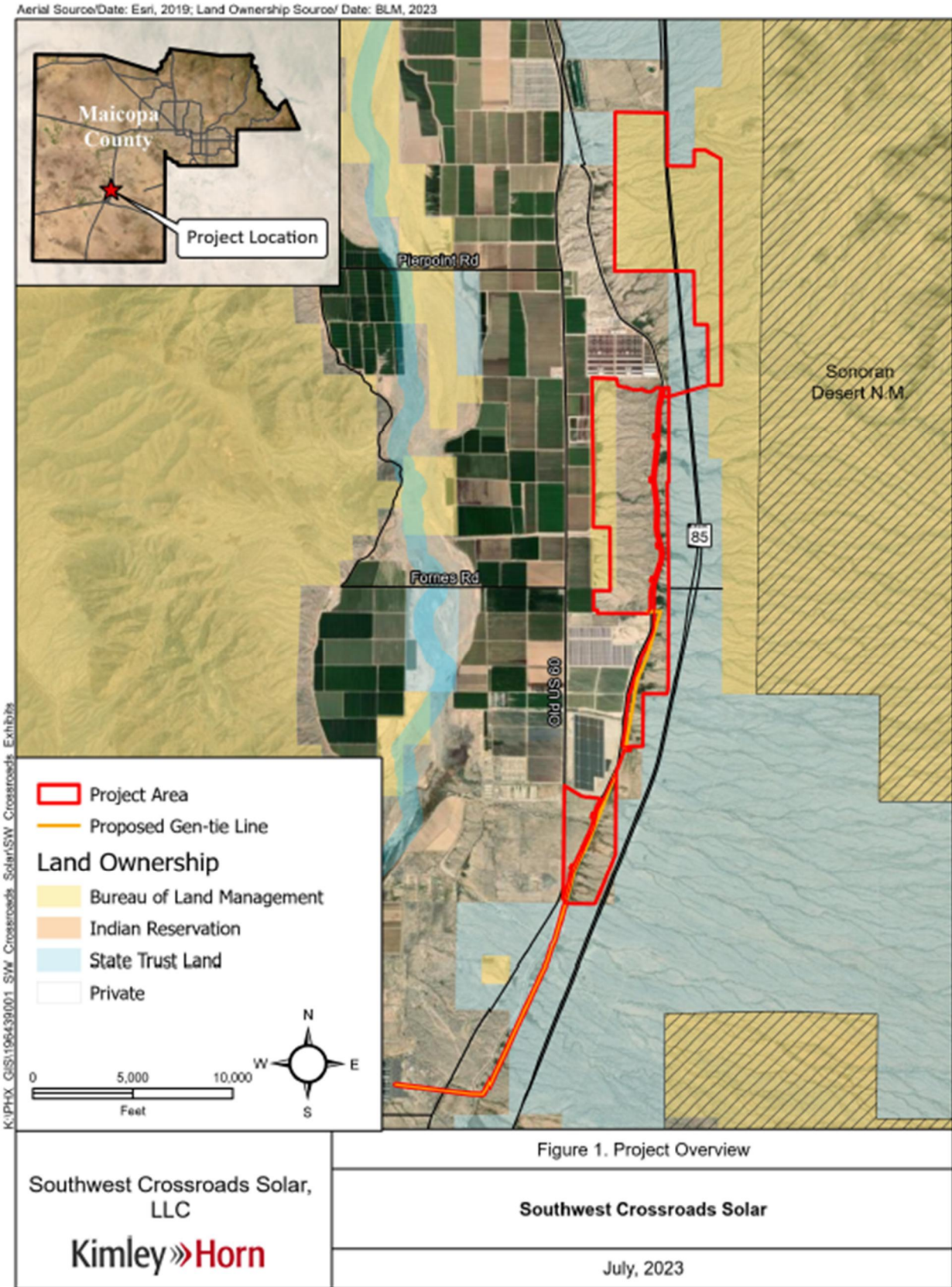


Figure 1. Project Overview

1.2 Project Location

The generation facility and collection ROWs would be located in Sections 2, 3, 10, 11, 14, 15, 22, 23, 27, and 34 of Township 4 South, Range 4 West, and Sections 3, 9, and 10 of Township 5 South, Range 4 West. The gen-tie line would extend into Sections 15, 16, 20 and 21 of Township 5 South, Range 4 West. Locations of the Project components are included in the Project Map Book (**Appendix A**). Most of the Project area is within the incorporated limits of the Town of Gila Bend, Arizona, approximately 50 miles southwest of Phoenix. The Project would be located, in part (1,188.6 acres), on public lands administered by the Bureau of Land Management (BLM) Lower Sonoran Field Office (LSFO).

1.3 Project Schedule

Provided that the Project is approved and receives all necessary permits as scheduled, Project construction is planned to commence in 2026 and have a target completion of 2028 at which time the project would become operational. Construction of the facilities on BLM land is expected to take approximately 18-24 months.

This Plan of Development (POD) has been prepared to support the Applicant's ROW application and will be updated and finalized by the Applicant following BLM review, advanced Project design, and completion of the BLM's review process under the National Environmental Policy Act (NEPA).

1.4 Project Purpose and Need

The purpose of the Project is to generate renewable electricity, create new energy storage capacity to support integration of intermittent renewable energy resources, and contribute beneficially to local job creation and the economy. This Project is needed to add renewable energy to the energy transmission grid in southwestern Arizona. This need largely results from the growing demand for energy in light of conventional coal power plant retirements and increasing demand for renewable energy and to meet consumer demand and federal and State regulatory requirements.

Public benefits of the Project and the associated infrastructure include providing clean energy to the energy grid. Renewable energy has several public environmental benefits compared to energy produced using fossil fuels, including reduced greenhouse gases, reduced air pollution, and reduced water use

The Project meets a number of objectives at the local, state, and federal levels. These include:

- Arizona Renewable Energy Standard and Tariff (REST) require that regulated electric utilities must generate 15 percent of their energy from renewable resources by 2025
- the need for additional energy supplies to serve the region
- the priority placed on meeting this need and Arizona's Renewable Energy Standard with clean, renewable energy
- the BLM's commitment, via their solar energy program, to promote the use of public lands for renewable energy development.

Additionally, a number of policy directives and agency actions at the federal level promote the development of renewable energy resources:

- The Project promotes the broader goal of the current federal administration of achieving carbon pollution-free electricity by 2035 and achieving a net-zero emissions economy by 2050, including the following specific directives:
 - Section 3104 of the Energy Act of 2020 sets a goal for the Department of the Interior to permit at least 25 gigawatts of renewable energy on federal lands by 2025. The Secretary of the Interior will set further National goals for wind, solar, and geothermal energy production on federal lands no later than September 2022.
 - Presidential Executive Order 14008 (2021), Tackling the Climate Crisis at Home and Abroad, in which the Department of the Interior identified steps to accelerate responsible renewable energy production on public lands and waters to support climate and environmental goals.

Prior similar laws and orders led to, among other things, the BLM issuing a Solar Energy Development Policy in 2007, and the Final Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (PEIS) and the associated Record of Decision (BLM 2012a, 2012b).

1.5 Resource-based Project Modifications

The proposed project area was selected due to its location as an excellent solar energy resource; existing gen-tie interconnection facilities in the vicinity; and regional access to highway infrastructure. Following initial agency feedback regarding natural resources via a meeting with the BLM and Arizona Game and Fish Department (AZGFD) on February 1, 2023, and, again, with the BLM regarding cultural resources on March 30, 2023, the Applicant updated the project layout to omit areas where known resource conflicts could occur. As a result, the generation facility area was reduced by approximately 212 acres (209 acres reduction in BLM land). The following updates to the project have occurred:

- **Burrowing owls:** an owl relocation site managed by Wild at Heart is located in the southern BLM parcel in the Project area. BLM requested that the project avoid impacts. The Applicant has removed this site from the project area, in addition to a 150-foot buffer around the site (**Figure 2**).
- **Wildlife linkages:** two portions of the much larger Sierra-Estrella Linkage Design managed by AZGFD cross the Project area in an east-west direction. BLM requested that the project incorporate measures to reduce impacts on the linkages. The Applicant has removed some project area from within the wildlife linkage and incorporated no-build conservation corridors within the project area in other instances, where the project intersects with the linkage. Additional design measures to reduce wildlife impacts will be incorporated and are discussed in Section 6.1.3 (**Figure 2**).
- **ACEC:** the far southern PV arrays and the gen-tie are within a BLM polygon for the Lower Gila Terraces and Historic Trails Area of Critical Environmental Concern (ACEC). Although these areas are entirely on private and state lands, and therefore not part of the ACEC, BLM requested that the project incorporate measures to reduce impacts to resources protected by the ACEC. Following Class III cultural resources field inventory, cultural resource impacts will be avoided to the extent feasible and/or mitigated to the extent required.

The project may be revised further after additional engineering design. Alternative site configurations, parcel layout and gen-tie line alignments are anticipated to be studied as part of the NEPA process.

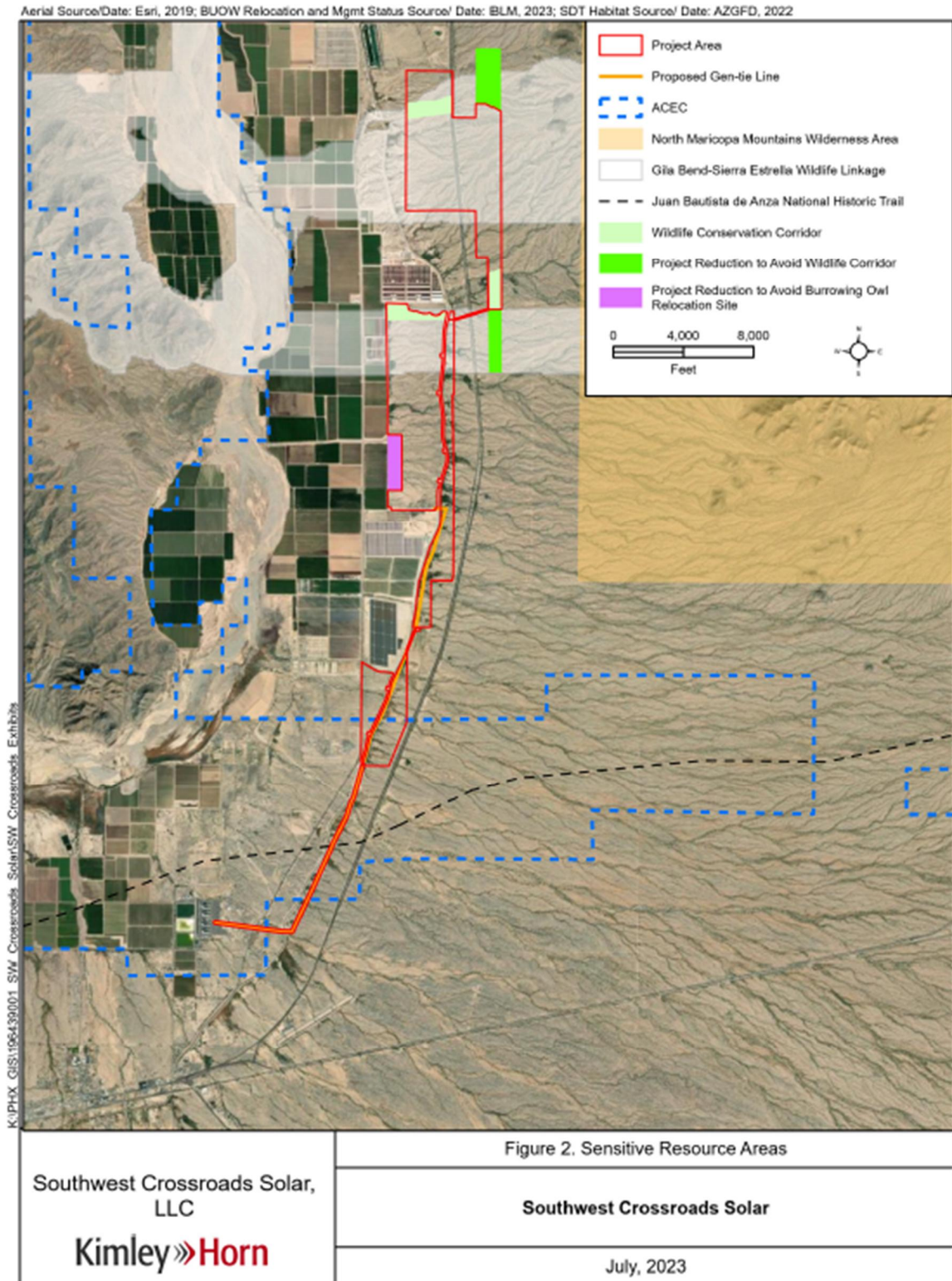


Figure 2. Sensitive Resource Areas

1.6 Preliminary Authorizations, Permits, Reviews, and Approvals

The Applicant submitted the SF-299 application for a ROW Grant on September 27, 2022 in accordance with the regulations set forth at 43 CFR Part 2800 and in conformance with BLM’s multiple use mandate. The Federal Land Policy and Management Act of 1976 (FLPMA) defined BLM’s multiple use mission at Section 103 c. (43 United States Code [USC] 1702) in part as:

“...the management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; ...the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources,...with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.”

A full review of the project’s conformance with the BLM’s Lower Sonoran Record of Decision/Approved Resource Management Plan (2012) Land Use Authorizations that provides direction for lands managed by the Lower Sonoran Field Office would be completed as part of the NEPA process. Upon preliminary review, the project appears consistent with the current Land Use Authorizations. The Project avoids current specially designated lands, including Areas of Critical Environmental Concern, Exclusion and Avoidance Areas, Sonoran Desert Tortoise Habitat, and Class I and II Visual Resource Management Classes. The location of the proposed ROW was selected to minimize new disturbance and sensitive land uses per the RMP. If a ROW grant is issued, the Project would be authorized under management actions LR-1.1 (solar facility) and LR-1.2.2 (gen-tie):

LR-1.1 (Utility-scale Renewable Energy Development LUAs): Authorize utility-scale renewable energy development LUAs in locations that are found to be suitable due to limited conflicts with other management objectives.

LR-1.2.2: Major linear LUAs may be authorized on case-by-case basis outside designated multiuse utility corridors if they are due and necessary in connecting a generating facility to the closest designated multiuse utility corridor (BLM 2012b, page 2-72).

Table 2 shows the major federal, state, and local permits, authorizations, and approvals that may apply to resources within the Project area. The authorizations listed in **Table 2** are preliminary and subject to change based on final project design and site conditions.

Table 2. Project Authorizations, Permits, Reviews, and Approvals

Authorization	Agency Authority	Statutory Reference	Permit Trigger
Federal			

Variance determination	BLM	BLM/DOE (U.S. Department of Energy) 2012. Final Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States. Report No: FES 12-14; DOE/EIS-0403. Washington, DC: U.S. Department of the Interior	Development of solar facility on designated variance area
Right-of-way (ROW) authorization	Bureau of Land Management (BLM)	Federal Land Policy and Management Act of 1976 (Public Law 94-579 [1976]; 43 United States Code [USC] 1761-1771 [1976]; 43 Code of Federal Regulations [CFR] 2800 [2009]).	Easement on federal land.
Incidental take authorization	U.S. Fish and Wildlife Service(USFWS)	Section 7 of the Endangered Species Act (Public Law 93-205, as amended by Public Law 100-478; 16 United States Code [USC] 1531, et seq.; 50 Code of Federal Regulations [CFR] 17)	Potential for presence and/or take of a federally protected species.
Migratory Bird Treaty Act	USFWS	16 USC 703–712; 50 CFR 21	Potential to take migratory birds.
National Historic Preservation Act (NHPA) compliance, determination of effect concurrence	Arizona State Historic Preservation Office	NHPA, the American Indian Religious Freedom Act, and the Native American Graves Protection and Repatriation Act.	Federal nexus, discovery of human remains, or disturbance on state-owned lands.
Clean Water Act Section 404/401 permit	U.S Army Corps of Engineers(Corps)	33 U.S.C. §§ 1251-1377	Fill in potential Waters of the U.S.
State			
Clean Water Act Section 402 permit (Arizona Pollutant Discharges Elimination System (AZPDES))	Arizona Department of Environmental Quality (ADEQ)	A.R.S. 49-255 et seq.	Construction Activity General Permit (CGP) for Stormwater, Notice of Intent and Stormwater Pollution Prevention Plan, https://azdeq.gov/node/524
Certificate of Environmental Compatibility (CEC)	Arizona Corporation Commission (ACC)	Title 40, Chapter 2, Article 6.2 (Sections 40-360 through 40-360.13)	Transmission lines over 115kV
State Lands Easement	Arizona State Land Department (ASLD)	A.R.S. § 37-461	Easement on ASLD Lands
Utility Crossing over State Roads	Arizona Department of Transportation (ADOT)	A.R.S. § 28-363	Line Crossing SR-85
Notice of Intent	Arizona Department of Agriculture	A.R.S. 3-904	Notice of intent for removing native plants
Local			

Comprehensive Plan Amendment (if needed)	Maricopa County	Comprehensive Plan	Requires review to determine project conformance with existing Comprehensive Plan
Rezone- Industrial Unit Plan Development	Maricopa County	County Zoning Code	Requires review to determine project conformance with existing zoning code.
Utility Crossing over Gila Bend Canal	Paloma Irrigation and Drainage District (PIDD)	A.R.S. § 48-20	Line Encroachment and Crossing within Gila Bend Canal ROW
Transmission Line Zoning Variance	Maricopa County	Maricopa County Code and Zoning (Article 1111.7)	Transmission structure over 120 ft high

It is anticipated that the following additional environmental plans would be prepared for this Project, although these plans are subject to change based on final project design, site conditions, and mitigation measures:

- Vegetation Management Plan
- Noxious and Invasive Weed Control Plan
- Decommissioning and Reclamation Plan
- Spill Prevention, Containment, and Countermeasures Plan
- Stormwater Pollution Prevention Plan

1.7 Applicant’s Financial and Technical Capabilities

Southwest Crossroads Solar, LLC is a wholly owned subsidiary of Longroad Energy Holdings, LLC (Longroad), which is a Boston-based developer, owner, and operator of renewable energy projects, and is led by a team of industry veterans with a demonstrated track record of success. Longroad Energy Holdings LLC is owned by three separate entities: Infratil US Renewables, Inc., NZSF US Renewables, Inc., and Longroad Energy Partners, LLC (“LEP”). Infratil and NZSF have over NZ\$66 billion/US\$42 billion in assets under management.

Longroad has extensive experience developing, financing and operating utility-scale wind and solar projects. The Longroad team has successfully developed over 6.0 GW of utility-scale wind and solar projects during its time at First Wind and Longroad. Since 2019, Longroad has brought eleven major projects to COD, including 1.9 GW of solar projects. The Longroad team also has significant experience owning and operating wind and solar projects. Longroad, through its subsidiary Longroad Energy Services, LLC (“LES”), is currently contracted to operate and manage 3.5 GW of operating or under-construction solar and wind projects across the United States, of which Longroad owns 1.6 GW. Longroad operates 19 renewable energy projects in Arizona including utility-scale solar, distributed generation scale solar, and large solar carport structures.

2 PROJECT DESCRIPTION

The project would include the construction, operation, maintenance and decommissioning of a 250MW solar generation facility, BESS, collector and transmission system, and associated site infrastructure. The solar generation facility portion of the Project would include approximately 10 individually fenced areas that house PV modules; and internal collector lines and a collector substation, a BESS, an operation and maintenance (O&M) facility with an office building, a warehouse, and parking area, and unpaved access roads. In addition, the Project would include a 5.8-mile-long generation-tie (gen-tie) line to deliver power to the existing Gila River 500-kV Substation, which is approximately 2.5 miles southwest of the Project and is operated by the Salt River Project (SRP).and internal collector lines and a collector substation.

The major components of the project would include:

- Solar arrays consisting of PV modules installed in rows on tracking equipment and posts
- Power Conversion Systems (PCS) on concrete or steel pads with direct current (DC) to alternating current (AC) power inverters and Low to medium voltage (1,500 V to 34.5 kV) transformers
- Medium voltage (34.5 kV) collection system
- Battery energy storage system
- Collector substation and switchyard
- Meteorological stations
- Telecommunications equipment
- O&M area with an office, warehouse, and parking area
- Gen-tie line (500 kV) with up to 200-foot-tall poles to connect to the switchyard to the Gila River 500-kV Substation, which is operated by the SRP.

Construction of the Project would not be phased.

2.1 PV Solar Arrays

The Project would include multiple rows of solar modules mounted on single axis tracking systems to follow the sun throughout the day. The panels would be minimally reflective, dark in color, and highly absorptive. The single axis trackers will be supported by vertical posts driven approximately 5 to 10 feet (1.5 to 3 meters) into the ground. The PV modules will be positioned to receive optimal solar energy over the course of a year. The modules would be mounted on steel and aluminum support structures on a single axis tracker system. The tracker system will be constructed in north/south oriented rows with the PV modules mounted to track from east west daily. The number and type of solar PV system used will depend on the technology ultimately selected at the time of procurement. Once mounted, the modules would not exceed 12 feet in height at full tilt.

2.2 DC Collector System and Power Conversion System

The Project would include low-voltage underground or above ground cables to convey the direct current (DC) electricity generated by the modules via wire combiner boxes located throughout the PV arrays, to PCS inverters to convert the electricity from DC to alternating current (AC). The modules would be electrically

connected to wire harnesses secured to the panel racking system that collects power from several rows of modules and feed inverters at the PCS. After the electricity is converted to AC, the electricity would be stepped up in voltage to 34.5kV via transformers located close to the inverters. Each PCS would have a concrete or steel pile foundation and would support encased units of inverters and transformers.

2.3 AC Collector System

The Project would include a medium voltage 34.5 kV electrical collection system that would connect the PV solar arrays to the Project collector substation. The system would include above ground or underground conductors that connect the PCSs to the collector substation. Aboveground conductors would be installed on metal or wood poles. Underground conductors will be installed using open trench or directional boring construction techniques. Telecommunications lines would also be installed alongside the electrical lines, either above or below ground. The AC collector system will also connect the various fenced-in generating facility areas (Project Map Book in **Appendix A**).

2.4 Battery Energy Storage System

The Project would include a BESS with a capacity of up to approximately 4 hours of 250 MW and would be connected to the solar facility using a DC-coupled system. The BESS would occupy up to 20-acres in the central part of the Project area, adjacent to the substation (Project Map Book in **Appendix A**). The battery units would be housed within purpose-designed, prefabricated enclosure(s).

The BESS site would be graded and consist of a mostly gravel surface. Each battery enclosure would use an intelligent fire detection, alarm, and notification system, in which fire detectors would be smoke detectors and thermal detectors. Detection of smoke or heat would trigger remote alarms to a Renewable Operations Control Center and activate audible/visual alarms on exterior of the battery storage enclosures. The battery enclosures' safety systems will be designed according to National Fire Protection Association Standard 855: Standard for the Installation of Stationary Energy Storage Systems. Damaged or spent batteries would be removed from the site and disposed of or recycled in accordance with federal and state regulation.

The final configuration of BESS modules and PCS pads and number of BESS modules and rows would depend on the final technology selected when equipment procurement is set to commence. Once the final composition of varying technologies is selected, the Applicant would produce an optimized layout that takes landscape features, drainage considerations, and maintenance access into account.

The BESS will tie into the 34.5-kV bus of the collector substation, where the electrical power would be stepped up from 34.5 kV to 500 kV.

2.5 Collector Substation and Switchyard

The Project would include a collector substation and adjacent switchyard in the central part of the Project area, adjacent to the BESS (Project Map Book in **Appendix A**). The collector substation would consist of a new main power transformer that would increase the voltage from 34.5 kV to 500 kV. The transformer type would be non-polychlorinated biphenyl (non-PCB) oil filled. In addition, the substation would include breakers, bus work (rigid conductors), and capacitor banks/reactors, as required. The maximum heights for most substation equipment would be 25 feet or less, although support structures and riser equipment would match the height of the gen-tie line. The maximum width of the collector line ROW would be 100 feet.

The substation would also include a metal-clad control building, which would be a building, which would house protective relays and communications infrastructure. The building would be up to 25 feet tall and painted in a neutral color (e.g., beige or gray). Once the electrical power is at utility voltage (500 kV), it would be exported via the gen-tie line.

2.6 Gen-tie Line

The Project would include an approximately 5.8-mile-long 500 kV gen-tie line connecting the collector substation to the existing Gila River 500-kV Substation. The gen-tie line would consist of overhead single circuit 500kV line, set predominantly on steel H-frame structures. The structures would be 200-feet tall or less. The average width of the gen-tie ROW is anticipated to be 200 feet, but could be as wide as 300 feet. For planning purposes, a ROW width of 300 feet for the gen-tie is assumed.

2.7 Interconnection

The Project point of interconnection to the grid would be at the existing Gila River 500-kV Substation, which is approximately 2.5 miles southwest of the Project and is operated by SRP. SRP would incorporate upgrades in its equipment to support interconnection of the gen-tie line, potentially including installation of a new circuit breaker and additional switches. SRP's improvements would occur within areas previously disturbed and occupied by existing electrical facilities.

2.8 Operation and Maintenance Facility

The Project would include an O&M area with an office, a warehouse, and associated parking area, in the central portion of the project, near the collector substation and BESS area. (Project Map Book in **Appendix A**). The O&M area would include a modular office style building approximately 30 feet by 60 feet (1,800 square feet) and a warehouse approximately 40 feet by 75 feet (3,000 square feet). The building would be up to 25 feet tall, and be painted in a neutral color (e.g., beige or gray). The O&M parking area would include up to 15 parking spaces. The O&M office building may include an office, control room, restroom, septic tank and leach field, and electrical and communications utilities.

Roads, driveways, and parking lot entrances would be constructed in accordance with Merced County improvement standards. Parking spaces and walkways would be constructed in conformance with all California accessibility regulations.

2.9 Temporary Construction Workspace Laydown and Staging Areas

Several temporary staging areas for construction laydown and parking may be established. Temporary staging areas could include parking areas, covered trash disposal facilities, construction trailers, a laydown area, and portable toilets and potable water for use by construction staff. The locations of temporary workspaces laydown and staging areas would be determined after further Project engineering design.

2.10 Control System and Telecommunications

The Project would include an onsite Supervisory Control and Data Acquisition (SCADA) system that would allow for remote monitoring and control of inverters and other critical Project components. The SCADA system would monitor Project power output and availability and run diagnostics on the equipment. Access to the Project's SCADA system would be accomplished with wireless and/or hard-wired connections to locally available commercial service providers (e.g., a local exchange carrier). The SCADA system would be located in the O&M office and/or the Project Substation Control Building.

The Project may require redundant telecommunications connections. The primary telecommunication line

would consist of either a microwave tower or fiber optic cable and/or copper telecommunication line, installed above and/or below ground. The Project telecommunication route may use a combination of existing poles, new poles, and/or below ground installations between the point of connection to existing telecommunications infrastructure and the Project components. Telecommunications lines may be installed with electrical collector lines, either above or below ground. Telecommunication lines may also be attached to the new gen-tie line. Telecommunication lines, if needed, would be placed within utility franchise easements to the extent feasible. A digital radio system may also be used. A secondary (backup) internet connection may be provided using a point-to-point microwave wireless link.

2.11 Meteorological Station

The Project would include one or more onsite solar meteorological stations (weather stations), which would consist of various sensors to measure solar energy (irradiance), air temperature, wind temperature and direction, humidity, and precipitation. Power for the meteorological stations would be provided by the plant auxiliary power system or a dedicated PV module with a small battery. Data from each sensor would be collected by the station's data-logger and transmitted to the Project's SCADA system for monitoring and reporting purposes. The meteorological stations would likely be mounted on structures that are expandable from 6 to 15 feet in height.

2.12 Site Security and Fencing

The boundary of each of the approximately 10 generation facility areas would be secured by a six-foot-tall chain-link perimeter fence, topped by one-foot of barbed wire. The bottom of the security fence would be designed with gaps to facilitate wildlife movement, as appropriate, following consultation with the BLM and AZGFD. The security fence ingress/egress would be accessed via a locked gate. Motion sensitive, directional security lights may be installed to provide adequate illumination around the substation area, each inverter cluster, at gates, and along perimeter fencing. All lighting would be shielded and directed downward to minimize the potential for glare or spillover onto adjacent properties. Infrared security cameras, motion detectors, and/or other similar technology may be installed to allow for monitoring of the site through review of live footage 24 hours a day, 7 days a week. If such equipment is required, the equipment would be placed along the perimeter of the Generation Area and/or at the inverters.

2.13 Access and Transportation

During construction and operation, the Project area would be accessed SR85, Old U.S. Highway 80, and other nearby roads. New access to the Project area from SR85 may be pursued. Equipment and materials would be stored in laydown areas within the Project area during construction. Additional laydown areas would not be anticipated to be required. Equipment used during construction would include heavy civil equipment to prepare and clear the project area, level and compact the Generation facility areas and sites at each gen-tie structure, and cranes to assemble and lift project components into place.

Construction activities would require access by service vehicles, construction equipment, cranes, and trucks carrying the project components and other construction materials. The proposed project would use existing access roads wherever practical to minimize disturbance.

New access roads would be built where no existing access roads exist to access the Project area. New temporary access roads would be approximately 20-foot-wide gravel surfaced or compacted native soil access roads. Light grading could be needed to remove any localized impediments to passenger and construction vehicles and equipment. However, grading would be limited, when possible, in order to reduce the potential for severe soil erosion.

A traffic study for the Project would be completed as part of project planning.

2.14 Fire Protection

Appropriate fire protection and suppression measures will be incorporated into Project design. Project components would be designed, constructed, and operated in accordance with applicable fire protection codes and other environmental, health and safety requirements. Effective maintenance and monitoring programs are key to Project productivity as well as to fire protection, environmental protection, and worker protection.

There is limited potential for wildfire in the Project Area, as vegetation is sparse. A fire management plan for the Project would be developed prior to construction and coordinated with the BLM, Arizona State Land Department (ASLD), Gila Bend County Fire Department, and other applicable jurisdictions as appropriate, to define measures to be taken to prevent and control the risk of fire. Best management practices during construction, including fuels management, would be incorporated into the plan.

2.15 Health and Safety Program

The Project would implement a comprehensive health and safety program consistent with all applicable state and federal regulations and industry best practices to ensure the proposed project is built and operated in a safe, responsible manner and presents a safe working environment for all employees. A Health and Safety Plan would be developed prior to construction. Familiarity with and adherence to safety policies and procedures would be required of all site workers during construction and facility operation. Participation in safety briefings and protocol review would be mandatory for all site workers.

The design, construction, operation, and maintenance of the project components would meet the requirements of the National Electrical Safety Code and U.S. Department of Labor Occupational Safety and Health Standards. The Applicant and any associated contractor would provide a safe work environment at all times. This would include barricading/covering/flagging holes when left for the day. At the end of the day all tools would be gathered, cached, and secured to prevent safety problems and vandalism.

2.16 Geotechnical Investigations

Geotechnical assessments of the Project area soils and underlying geology would be conducted and incorporated into final engineering design for the Project. The appropriate permits would be obtained prior to completing the geotechnical investigations. A preliminary desktop geotechnical assessment would be conducted prior to a field investigation to evaluate the mapped geologic units and to collect exploratory borings from various locations across the Project Area. The study would include survey work, conducting geotechnical borings, soil sampling, and thermal and electrical resistivity testing, as needed. Numerous bores would be drilled throughout the area for the solar arrays and the gen-tie and collection lines.

2.17 Surveying and Design

Survey and preliminary design and engineering work would be performed to refine the location of facility components, the spatial parameters of the collector and gen-tie line corridors, and to determine accurate topographical profiles across the Project area. Topographic profiles would help determine specific design and location of project components. Project components would also be laid out in a manner that minimizes impacts to natural and cultural resources.

3 CONSTRUCTION

In general, construction of the Project will be accomplished in the following sequence:

- Mobilization
- Development of construction staging and parking areas to facilitate the arrival of workers and equipment on site
- Construction of security fencing
- Site preparation including installation of stormwater management features, localized grading, and compaction
- Construction of roads, laydown areas, electrical equipment pads, BESS and building foundations
- Installation of posts for the PV racks and PCS pads
- Development of site substation/switchyard
- Installation of gen-tie line and collection system structures and wiring
- Installation of PV racks, inverters and transformers, BESS, and trenching for wiring
- Installation of PV modules and wiring
- Completion of interconnection
- Testing and commissioning
- Demobilization

The duration of construction is anticipated to be 18-24 months. Peak construction activity is expected to occur from approximately months 3-21. Electrical power needed for construction would be supplied from 100-kilowatt (kW) diesel or propane generators.

3.1 Construction Workforce and Equipment

Construction of the Project would not be phased. The peak construction workforce is estimated to be 250 workers, with an average workforce of 150 workers. The construction workforce is anticipated to primarily come from a 40-mile radius within Maricopa County. The typical construction work schedule would be expected to be from 7:00 a.m. to 5:00 p.m., Monday through Friday. However, to meet schedule demands or to reduce impacts, it may be necessary to work early morning, evening, or nights and on weekends during certain construction phases. The work schedule could be modified throughout the year to account for changing weather conditions (e.g., starting the workday earlier in the summer months to avoid work during the hottest part of the day for health and safety reasons). If construction work were to take place outside these typical hours, activities would comply with local Town of Gila Bend standards for construction noise levels. For safety reasons, certain construction tasks, including final electrical terminations, must be performed after dark when no energy is being produced.

Most construction equipment and vehicles would be brought to the Project area at the beginning of the construction process during construction mobilization and would remain on-site throughout the duration of the construction activities for which they were needed. In addition to construction worker commuting vehicles, construction traffic would include periodic truck deliveries of materials and supplies, trash pickup

and other truck shipments. The number of truck deliveries expected over the construction period would be approximately 60 per week. Materials would typically be delivered starting a few weeks before the start of the associated task.

The Project would use restricted nighttime task lighting during construction. No more lighting would be used than is needed to provide a safe workplace, and lights will be focused downward, shielded, and directed toward the interior of the site to minimize light exposure to areas outside the construction area.

3.2 Site Preparation

The Applicant would complete preliminary engineering and site assessments to determine site constraints as part of project planning prior to completing site preparation activities, including survey and staking. Specific construction and operation signage and flagging for the site will be developed prior to construction. Once survey work is complete, the Applicant would obtain sufficient survey information and topographic information to support both the storm water modeling and grading design, and construction layout with staking. The final site plans for the proposed project would be based on the detailed topographic survey of the site that is performed as a part of the permitting and engineering design process. Road corridors, electrical line centerlines, PV array locations, and the locations of other facilities would be located and staked to guide construction activities. Preconstruction survey work would consist of staking and flagging the following: (1) ROW and construction area boundaries, (2) work areas (permanent and short term), (3) cut and fill, (4) access and roads, (5) gen-tie line structure centers, (6) foundation structure, and (7) environmental avoidance areas, if any. Staking and flagging would be maintained until final cleanup.

Site preparation activities would include completion of pre-construction surveys, installation of BMPs and mitigation measures as specified in site permits; preparation and construction of site access roads, establishing temporary construction trailers and sanitary facilities, and preparing construction staging areas. Mobilization would include bringing construction equipment to the sites prior to start of construction.

3.3 Site Clearing and Grading

Vegetation would be cleared in large portions of the Generation facility areas prior to construction; however, clearing would be limited to the extent possible to accommodate construction of the Project. The roll and crush method would be used to extent feasible, with plant roots left intact to preserve topsoil. If and where reasonable, topsoil would be separated and stored apart from lower subsurface materials during grading in order to maintain the structure and biota of the soil.

Grading would be minimized to the extent possible to allow for installation of the PV modules. Grading would be required for the inverter pads, substation, driveways, and other improvements. Soil compaction, soil strengthening agents, or geo fabric may be used for access and circulation driveways. Compaction may also be required for the construction of inverter pads, substation, control rooms, and driveways. Driveways and other work areas would be sprayed periodically with water to reduce dust. Driveways and work areas may also be treated with BLM and county-approved dust suppression products. Areas comprising the solar field would be prepared using conventional equipment including tractors with discing equipment and vibratory rollers, with limited use of scrapers to perform micrograding within sections of the solar array field.

Limited cut and fill would be completed within specific arrays to limit slope to within 5% and produce a consistent grade in each solar array area. Requirements for cut and fill grading would be defined after completion of initial site studies. Hydrology analysis would evaluate the areas that are susceptible to scour

from storm water runoff. The ground would be graded to a level topography using micrograding only where necessary. Macro level topography and stormwater drainage would remain unchanged.

Structure pads, stringing sites and staging areas are areas of temporary disturbance and would not be maintained during operation and maintenance activities of the Project. Areas of temporary disturbance would be restored after construction is complete, including re-contouring to pre-construction condition and reseeding with local, native, certified weed-free seed mix to revegetation standards specified by the BLM.

3.4 Solar Array Construction

Construction activities would include the installation of civil infrastructure (e.g., driveways, utilities, maintenance building, fencing), mechanical infrastructure (e.g., piles, tracking components), and electrical infrastructure (e.g., PV modules, BESS, substation, cable harnesses). Equipment specifications will be refined as project development progresses.

3.5 Electrical Construction

The photovoltaic modules will typically be organized into approximately 1 – 5 MW groups referred to as arrays. Near the center of each array will be a PCS, consisting of one or more power inverters, one step-up transformer, cabling systems and grounding systems. The equipment within the PCS prepares the solar power to be interconnected to the electrical grid. The inverters convert the low voltage direct current (DC) electricity generated by the panels to alternating current (AC) electricity. The step-up transformer then steps up the voltage of the AC electricity to medium voltage (34.5 kV). Once the voltage is stepped up to medium voltage, the electricity will be routed by underground or aboveground collection lines to the on-site collection substation, which in turn will again step up the voltage to meet that of the electrical grid (500 kV).

Electrical inverters and the transformer would be placed on concrete foundation structures or steel skids. Commissioning of equipment would include testing, calibration of equipment, and troubleshooting. The substation equipment, inverters, collector system, and PV array systems would be tested prior to commencement of commercial operations. Upon completion of successful testing, the equipment would be energized. Certified electricians in the construction workforce would perform appropriate Project electrical construction activities starting with combiner box connections. Utility journeymen may be required to perform or supervise the higher-voltage electrical construction activities for the on-site substation and gen-tie line

3.6 Gen-tie

An auger truck or excavator would excavate a hole for each structure base or for a foundation if required. If the pole would require a concrete foundation, then concrete would be placed to fill the hole with reinforcing steel bars and anchoring bolts. Vertical excavations would be made with power auguring equipment. Blasting is not anticipated to be needed for installation of the gen-tie poles. Crews would assemble new pole structures on the ground then using a mobile crane, would position the structures in the augured holes and backfill around each pole or attach to concrete foundations.

Conductor installation and stringing would require the use of pickup trucks, manlifts/boom trucks, hydraulic tensioning machines, wire reel stringing trailers and drum pulling machines. Helicopter is not anticipated to be needed for conductor stringing.

3.7 Construction Materials

Mineral materials such as concrete, aggregate, sand and gravel for construction and road base would be sourced from permitted sources that are free from contamination. Concrete needed for the Project (e.g., for O&M building foundation and electrical equipment pads) would be manufactured at an offsite batch plant and transported to the Project by truck using Arizona State Route 85 (SR85), Old U.S. Highway 80-, and other major roads. This source(s) will be identified prior to start of construction.

3.8 Water Usage During Construction

Construction water usage rates and requirements would vary depending on the length and intensity of construction activities. During construction, water would be needed for primarily dust control and soil compaction, with small amounts used for sanitary and other purposes. Water would be obtained from several potential sources including an on-site or off-site groundwater well or trucked from an offsite water purveyor. No holding ponds are expected to be needed or placed in the Project area.

3.9 Erosion Control and Stormwater Drainage

A Stormwater Pollution Prevention Plan (SWPPP), including spill prevention measures, would be prepared for construction of the Project in compliance with the Arizona Pollutant Discharge Elimination System (AZPDES) requirements. The SWPPP would be prepared by a qualified engineer or erosion control specialist and would be implemented before construction. The SWPPP would be designed to reduce potential impacts related to erosion and surface water quality during construction activities and throughout the life of the Project. It would include best management practices (BMPs) to reduce erosion, protect nearby water resources, and control site drainage, including BMPs for dewatering procedures, stormwater runoff quality control measures, concrete waste management, watering for dust control, and construction of perimeter silt fences, as appropriate.

3.10 Spill Prevention

A project wide spill response plan would be developed prior to project construction and operation, and onsite workers would be made aware of the procedures for spill cleanup and the procedures to report a spill. Spill cleanup materials and equipment appropriate to the type and quantity of chemicals and petroleum products expected would be located on-site and workers would be trained and made aware of their location. The small quantities of chemicals anticipated to be stored in the Project area during construction include equipment and facilities maintenance chemicals. These materials would be stored in their appropriate containers in an enclosed and secured location such as portable outdoor hazardous materials storage cabinets equipped with secondary containment to prevent contact with rainwater. The portable chemical storage cabinets may be moved to different locations around the site as construction activity locations shift. The chemical storage area would not be located immediately adjacent to any drainage. Disposal of excess materials and wastes would be performed in accordance with local, state and federal regulations; excess materials/waste would be recycled or reused to the maximum extent practicable.

3.11 Waste Management

Construction of the Project would generate wastes such as construction debris and other solid waste, which would be recycled or reused, when possible, or disposed of offsite at a permitted landfill by a licensed contractor.

Petroleum products, including fuels, oils and greases would be used onsite during construction and maintenance activities. Such substances would be stored in temporary aboveground storage containers during project activities. Fuels stored on-site would be in a locked container within a fenced and secured staging area. If quantities exceed regulatory thresholds, they would be managed per the Spill Prevention, Control, and Countermeasure (SPCC) Rule and a Hazardous Materials Management Plan, which would be developed prior to construction. The use, storage, transport, and disposal of hazardous materials used in construction of the Project would be carried out in accordance with federal, state, and local regulations. Material Safety Data Sheets for all applicable materials present on-site would be made readily available to on-site personnel.

3.12 Site Stabilization, Protection and Reclamation

Site stabilization measures would be employed and maintained throughout construction activities. Following construction, reclamation of the temporary disturbance areas would occur. If required, a seed mix prepared in coordination with and approved by the BLM LSFO would be applied to all temporary disturbance areas, followed by applications of mulch as required to provide additional erosion control. Ungraded areas disturbed by compaction only (e.g. from overland travel) would be assessed in coordination with the BLM to determine if reclamation is needed for recovery of the area.

3.13 Vegetation and Weed Management

A vegetation and weed management plan would be prepared for the Project and implemented to facilitate revegetation with native plant species and control invasive exotic weeds. The plan would emphasize preservation of topsoil and root mass during site preparation and would specify effective revegetation measures. The plan would adhere to all state and BLM policies.

During project maintenance, mechanical control activities, such as chaining, disking, grubbing, and mowing using tractors or other heavy equipment may also be used as necessary. If herbicides or pesticides are required, they would be state and BLM-approved herbicides to control weed populations when manual control methods are not successful in managing the spread of invasive plants.

4 OPERATION AND MAINTENANCE

Once constructed, the proposed project would operate continuously, unless taken offline by emergency or for repair. Routine preventative maintenance would occur on a regular basis and would include visual inspection of the grounds, equipment and other project components as required and as appropriate.

Responsibly conducted routine maintenance activities would be anticipated to have minimal impact to resources. While carrying out routine maintenance activities, field personnel and contractors would adhere to basic standards and guidelines specified in project and site permits, special use stipulations, and any additional requirements identified in the BLM decision documents that would apply to the Project area. If for any reason the activities would require deviation from previously agreed to activities, field personnel and contractors would notify the BLM prior to initiating work on the activity and/or during the activity if additional problems are encountered.

4.1 Access

On-site and intermittent maintenance staff will access the site via SR-84, Old U.S. Highway 80, and other nearby paved roads. The designated access points to the Project during the operations and maintenance phase will be determined during site engineering design.

4.2 Emergency Response

Emergency response plans and procedures would be developed as part of project development and in coordination with the local fire department. The solar modules are designed to be resistant to fire and the racks are constructed of non-combustible steel and aluminum. The solar modules themselves do not distribute heat to the surrounding area. The BESS containers would be equipped with appropriate and redundant fire safety systems. The Project would include an internal perimeter road (or module setback) that would function as a fire buffer and facilitate onsite circulation for emergency vehicles.

4.3 Waste Management

Waste generated during operation would be stored and removed from the Project and disposed of in an approved manner. Onsite trash bins will have scavenger-proof lids.

4.4 Hazardous Materials

The Project would use a small amount of hazardous materials during operation. The Project would comply with all state and federal requirements pertaining to the storage and disposal of hazardous material and waste, including any applicable programmatic design features from the PEIS.

There are two main sources of hazardous materials: padmount transformers and inverters. Each padmount transformer may contain up to 500 gallons (1,893 liters) of oil and each inverter cooling system contains approximately 11 gallons (42 liters) of ethylene glycol/water mixture, totaling 25,550 gallons (96,717 liters) of hazardous liquid at this Project. These hazardous materials will be managed in accordance with applicable state and federal regulations.

Section 40 Code of Federal Regulations (CFR) Part 112 (1973) requires that a SPCC Plan be prepared for a project that stores oil in quantities greater than 1,320 gallons (4,997 liters) above ground and/or 42,000

gallons (158,987 liters) below ground. Therefore, a SPCC Plan will be prepared for the Project to address any potential spills that may occur following guidelines in 40 CFR 112 (1973).

4.5 Water Use During Operation

During Project operation, water would be required for panel washing and or other applications, such as dust control and herbicide application. It is anticipated that the solar PV modules would be washed up to three times per year to ensure optimum solar absorption by removing dust particles and other buildup. PV module washing would require up to 25 acre-feet per year. During Project operation, an above ground portable sanitary waste facility may be needed to retain wastewater for employee use. If installed, this facility would remain onsite for the duration of the Project. These facilities would be installed in accordance with state requirements and emptied as needed by a contracted wastewater service vehicle. Water required during operation and maintenance could be provided by onsite wells, purchased and trucked in from off-site and stored in storage tanks, or a combination of these sources. Water storage tanks would be installed if required by the Gila Bend Fire Department or the BLM.

4.6 Spill Prevention

A facility SPCC plan would be developed during project planning and would be implemented during operation, as required. BMPs would be employed in the use and storage of all hazardous materials within the Project area, including the use of containment systems in appropriate locations. Appropriately sized and supplied spill containment kits would be maintained on-site and workers would be trained on spill prevention, response, and containment procedures. In addition, in accordance with the Emergency Planning & Community Right to Know Act, Southwest Crossroads Solar, LLC would supply the local emergency response agencies with a Hazardous Materials Management Plan and an associated emergency response plan and inventory.

4.7 Vegetation and Weed Management

The Project would implement its vegetation and weed management plan during Project operation to facilitate revegetation with native plant species and control invasive exotic weeds. The plan would adhere to all state and BLM policies. During Project maintenance, mechanical control activities, such as chaining, disking, grubbing, and mowing using tractors or other heavy equipment may also be used as necessary. If herbicides or pesticides are required, they would be state and BLM-approved herbicides to control weed populations when manual control methods are not successful in managing the spread of invasive plants.

5 DECOMMISSIONING

The Project has an anticipated useful life of at least 40 years. At the end of the Project's useful life or upon termination of the ROW Grant, Southwest Crossroads Solar, LLC would decommission the facility and remove aboveground facilities including the PV arrays and supporting electrical and facility systems. Following facility decommissioning and removal, the Project area would be reclaimed per permit requirements and applicable regulations in effect at the time of decommissioning.

Decommissioning of the Project would include disassembling the permanent facilities. Concrete foundations would be removed to 3 feet below grade. The applicant would attempt to salvage materials and/or recycle components for future use, as applicable and economically feasible. Unsalvageable materials would be disposed at authorized locations. Demolition or removal of equipment and facilities would meet applicable environmental and health regulations.

Following the removal of Project facilities, the site would undergo final cleanup and reclamation. Areas disturbed during removal of Project features would be restored and rehabilitated as near as possible to their original condition and would be available for the same uses that existed prior to construction of the Project. It is anticipated that restoration would include re-contouring when necessary and reseeded impacted areas with a BLM-approved native seed mix.

6 ENVIRONMENTAL CONSIDERATIONS

6.1 Biological Resources

6.1.1 Vegetation

Most of the Project area is listed as Shrub/Scrub land cover by the National Land Cover Dataset (NLCD). There are also isolated pockets of barren land, herbaceous vegetation cover, and developed areas. Surrounding lands are classified by NLCD as mainly Shrub/Scrub and Cultivated Crops (**Appendix C**). Based on aerial imagery, the Project area has the potential to host riparian vegetation along drainages.

Biological resource surveys of the flora and fauna in the Project area would be completed as part of the project's NEPA review. If it is determined that the impacts on native plants would exceed 0.25 acres, a notification to the Arizona Department of Agriculture (AZDA) would be required. This notification would be submitted to the AZDA by the Applicant.

Invasive and noxious weeds rapidly displace desirable plants that provide habitat for wildlife and food for people and livestock. Invasive and noxious weeds are plants that are not native to Arizona and were introduced accidentally or intentionally. The Arizona Department of Agriculture has developed a State Designated Noxious Weed List defined by Arizona Administrative Code R3-4-245. The state has identified 19 Class A noxious weeds, 21 Class B noxious weeds, and 13 Class C noxious weeds. Class A Noxious Weeds are categorized as a species of plant that is not known to exist or of limited distribution in the State and is a high priority pest for quarantine, control, or mitigation. Class B Noxious Weeds are categorized as a species of plant that is known to occur, but of limited distribution in the State and may be a high priority pest for quarantine, control or mitigation if a significant threat to a crop, commodity, or habitat is known to exist. Class C Noxious Weeds are categorized as a species of plant that is widespread but may be recommended for active control based on risk assessment (ADA, 2020).

Prior to construction, a survey may be required by the BLM to determine if any noxious weeds are present within the construction and staging areas. To prevent the introduction of invasive species seeds, the contractor may be required to inspect all earthmoving and hauling equipment at the storage facility. All vehicles and equipment may need to be washed and free of all attached plant/vegetation and soil/mud debris prior to entering the construction site. Project specific BMPs and authorization requirements would be identified by the BLM as part of the NEPA process.

A noxious and invasive weed control plan would be prepared for the Project area and implemented to facilitate control invasive exotic weeds. The plan would specify effective weed control measures and would adhere to all state and BLM policies.

6.1.2 Wildlife and Special Status Species

The Applicant identified special status species potentially occurring in the Project area using the following sources:

- The BLM's sensitive species list, as updated in February 2017 (BLM 2017).
- The USFWS Information for Planning and Consultation (IPaC 2023)
- Arizona Game and Fish Department's (AZGFD) Environmental Online Review Tool Report (OERT 2023)

Information for Planning and Consultation (IPaC) reports that there is no federally designated critical wildlife habitats occurring within the Project area (**Appendix C**). IPaC lists five special status species with the potential to occur within the Project area (USFWS 2023). The Arizona Game and Fish Department's (AZGFD) Online Environmental Review Tool Report (OERT) lists four special status species documented within five miles of the Project area. AZGFD's OERT also lists one wildlife linkage, the Gila Bend - Sierra Estrella Linkage, that intersects the project footprint.

Sonoran Desert tortoise. The Sonoran Desert tortoise (*Gopherus morafkai*) is the primary BLM sensitive species of concern in the Project area. This species was a Candidate species for listing under the Endangered Species Act by the USFWS. However, on February 8, 2022, the USFWS determined that this species does not warrant Endangered Species Act Protection. The AZGFD OERT lists this species as occurring within 5 miles of the Project area. This species is a Tier 1A SGCN by AZGFD. Sonoran Desert tortoises typically inhabit bajadas and steep, rocky slopes of Mojave Desert scrub and Sonoran Desert scrub. Desert tortoises most often occur in paloverde-mixed cacti areas with boulders, rocky outcrops, and natural ground cavities nearby. According to AZGFD OERT, the nearest documented occurrence of the Sonoran Desert tortoise is approximately 3.7 miles to the west of the Project area and 3.1 miles east of the Project area. They are found throughout the area in the rocky bajadas and foothills. (Sabra Tonn, AZGFD, pers. comm. 2022). Compliance with the AZGFD Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects would be implemented to avoid potential impacts on tortoises.

Sonoran pronghorn. IPaC lists a non-essential, experimental population of Sonoran pronghorn (*Antilocapra americana sonoriensis*), as potentially occurring within the Project area. Sonoran pronghorn inhabit broad and level alluvial valleys separated by block-faulted mountains with either paloverde-saguaro or creosote-bursage associations. However, a review of AZGFD's online mapping tool (HabiMap) reports the closest historic, present, and predicted range as occurring approximately 27 miles to the southwest of the Project (AZGFD 2023a).

California least tern. IPaC lists California least tern (*Sterna antillarum browni*), a federally endangered species, as potentially occurring within the project area. California least terns inhabit parsley vegetated and exposed flats, typically along the shorelines of inland rivers, lakes, reservoirs, or drainage systems below 2,000 feet. However, a review of AZGFD's HabiMap tool reports the closest historic, present, and predicted range as occurring approximately 36 miles northeast of the Project (AZGFD 2023a). There is no suitable habitat for this species in the Project area.

Yellow-billed cuckoo. IPaC lists yellow-billed cuckoo (*Coccyzus americanus*), a federally threatened species, as potentially occurring within the Project area. Yellow-billed cuckoo's inhabit large blocks of riparian woodlands (cottonwood, willow, or tamarisk galleries). However, a review of AZGFD's HabiMap tool reports the closest historic, present, and predicted range as occurring approximately 36 miles northeast of the Project (AZGFD 2023a).

Yuma Ridgway's rail. IPaC lists the Yuma ridgway's rail (*Rallus obsoletus yumaensis*), a federally endangered species, as potentially occurring within the Project area. Yuma ridgway's rail inhabit fresh water and brackish marshes. However, a review of AZGFD's HabiMap tool has the closest historic, present, and predicted range as occurring along the Gila River corridor, approximately 0.5 mile west of the Project (AZGFD 2023a).

Monarch butterfly. IPaC lists the monarch butterfly (*Danaus plexippus*), a candidate insect species, as

potentially occurring with the Project area. Arizona is in the path for both the western and eastern populations of monarch butterflies. The Project area has the potential to host monarch butterflies if milkweed (*Asclepias spp.*) is present; however, no critical habitats have been designated for this species.

Western burrowing owl. The Western burrowing owl (*Athene cunicularia hypugaea*) is considered by USFWS as a Species of Concern (SC) and is a Tier 1B SGCN by AZGFD. Western burrowing owls are a small, ground-dwelling owl and inhabit open, well-drained grasslands, steppes, deserts, prairies, and agricultural lands. There is suitable habitat for this species in the Project area. The AZGFD OERT lists this species as present within 5 miles of the Project (AZGFDS 2023b), and there is a known burrowing owl relocation site immediately west of the Project (Figure 2).

Resplendent shovel-nosed snake. The resplendent shovel-nosed snake (*Chionactis annulata*) is considered a Tier 1C SGCN by AZGFD. The resplendent shovel-nosed snake is a small and round burrowing snake and inhabit sandy washed and xeroriparian habitats of the Sonoran Desert. According to AZGFD, the nearest occurrence of this snake is within the Project area and was last observed in 1999 (Sabra Tonn, AZGFD, pers. comm. 2022).

Cave myotis. The cave myotis (*Myotis velifer*) is considered by USFWS as a SC and is a Tier 1B SGCN by AZGFD. The cave myotis inhabits desertscrub of creosote, brittlebush, palo verde and cacti. They roost in caves, tunnels, and mineshafts, and under bridges, and sometimes in buildings within a few miles of water. According to AZGFD, the nearest occurrence of this bat is approximately 4 miles south of the Project and was last observed in 1986 (Sabra Tonn, AZGFD, pers. comm. 2022).

Wildlife linkage. The Gila Bend - Sierra Estrella Linkage Design is a 50,175-acre area in southeastern Maricopa County that intersects the Project area. The Linkage Design consists of a series of lands corridors that may provide the best routes for wildlife travel between the Gila Mountain area west of the Project and the Maricopa Mountains east of the Project. These corridors were identified by AZGFD biologists in 2008 using modeling methods. There are two corridors of the AZGFD-designated Gila Bend - Sierra Estrella Linkage that intersect the Project area (**Figure 2**). However, near the Project area, the linkages are characterized by active agricultural fields and various developments: both linkage corridors are bisected by SR-85, Old U.S. 80 Highway, and the Gila Bend Canal. There are only a few underpasses on SR-85 within the linkage corridors that wildlife could safely use (instead of crossing the highway blacktop). The canal is the main impediment to wildlife movement through the linkages (Beier, Garding, and Majka 2008), and there is only one canal crossing within each of the linkage corridors. The southern of the two linkages has a biogas facility across more than half its width, immediately west of the Project. In addition, there are access roads and active agricultural fields within the linkage corridors. As such, the usefulness of the linkages to wildlife movement may be substantially degraded.

Migratory Birds: Numerous migratory birds, including burrowing owls, are federally protected under the Migratory Bird Treaty Act (MBTA) of 1918. If the construction of the project were to occur during the nestings season for this region (February 1 to August 31), seasonal restrictions would be implemented. A qualified biologist would conduct a bird nest search in areas where ground disturbance is proposed to determine the presence/absence of active bird nests. If active nests are present, potential impacts would be avoided by installing and maintaining appropriate disturbance buffers and BMPs developed collaboratively with the BLM and the appropriate resource management agencies.

The Applicant will review the USFWS list of threatened, endangered, proposed, and candidate species and

AZGFD OERT for updates during the NEPA process, and appropriate consultations with agencies will be conducted to determine if new species have been identified or any changes in listing status have occurred.

6.1.3 Project Designs to Avoid Wildlife and Habitat Impacts

The Project has been sited to avoid or reduce impacts on sensitive wildlife areas, including two AZGFD-designated Wildlife Connectivity Linkage corridors, a burrowing owl relocation site on BLM-administered land, and most large dry washes with riparian corridors.

Wildlife Connectivity Linkages

Following initial coordination with AZGFD and the BLM, the Project was redesigned to preserve a wildlife movement corridor within each of the two designated linkages in the Project area (**Figure 2**). The wildlife movement corridors would be unfenced and would each be approximately 900 feet wide, or wider. Both proposed wildlife conservation corridors are centered on the Gila Bend Canal crossings within the linkages and follow wash drainage systems (**Figure 2**).

To achieve this, the Project was revised through a combination of (1) reducing the Project area boundary to avoid portions of the linkages, and (2) reducing the generation facility fenced-in areas so portions of the linkage fall outside of the fence line areas (**Figure 2**). Additional corridors maybe fall outside of Project fence lines, following final project fence design and layout.

Wildlife-Friendly Fences

Project fencing that occurs within an AZGFD-designated linkages (and potentially in other areas) would be constructed with a wildlife friendly design. These fences would include gaps at the bottom of the fence to allow passage of smaller mammals and reptiles. The Applicant would coordinate with the BLM and AZGFD to determine appropriate design, size, and spacing for wildlife fence gaps as part of project development.

Burrowing Owl Relocation Area

There is an approximately 55-acre burrowing owl relocation site adjacent to the central part of the Project area, on BLM land (**Figure 2**). The relocation site is managed by Wild at Heart, an Arizona-based conservation organization that specializes in relocations of burrowing owls and other raptor species. The Applicant coordinated closely with the Wild at Heart lead habitat biologist in the spring of 2023 to ensure that the Project does not interfere with the burrowing owl relocation program. As a result, the Project was revised to exclude the approximately 55-acre burrowing owl relocation area and an additional 150-foot setback from the relocation area, resulting in an approximately 60-acre reduction in the size of the Project area. The Project would continue to coordinate close with Wild at Heart during construction and operation to ensure potential impact on burrowing owls are minimized.

Large Dry Washes with Riparian Corridors

The Project has been designed to avoid or reduce impacts on many of the larger dry washes and associated riparian corridors that cross the Project area. Where possible, large washes that cross the Project area would not be included within the project fence lines. Preliminary project design to avoid large washes is shown on **Figure 2**. In other cases, dry washes may be included within the project fence lines, but no PV modules or other major project components would be placed in the washes, thereby further reducing impacts.

6.2 Special Land Use Designations

Per the Lower Sonoran Record of Decision/Approved Resource Management Plan (2012) Map 8, Renewable Energy and Map 9, Land Use Authorizations, the proposed project is situated outside the Land Use Authorization Exclusion Areas and Avoidance Areas.

ACEC: The Project is mapped within BLM's boundary polygon for the Gila River Terraces and Lower Gila Historic Trails ACEC. However, the portions of the Project that intersect with the polygon are entirely on private and state lands that cannot be included in BLM's ACEC boundary because BLM has no land use jurisdiction over non-federal lands. By BLM's own definition, ACECs are areas within existing public lands that require special management to protect important and relevant values (BLM 2023); therefore, no part of the Project is actually within the ACEC. BLM cannot apply its ACEC-specific management criteria or otherwise formally consider the project's consistency with the ACEC's management objectives during prioritization or NEPA review.

The Applicant nevertheless recognizes there may be potentially sensitive cultural and/or historical resources within this part of the Project site. The Applicant will conduct a Class III inventory, assess direct and indirect impacts, and avoid and/or mitigate impacts with Section 106 Consulting Parties input.

The Project is exploring the feasibility of collocating the gen-tie with existing developments, such as Old U.S. Highway 80 and the adjacent existing transmission line, or with the existing utility corridor approximately 1 mile east of the Project area.

6.3 Tribal, Cultural and Historic Resources

There are no sites currently listed on the National Register of Historic Places (NRHP) within the Project area. A Class I desktop cultural resources inventory was completed of the Project area on January 20, 2023, and identified multiple archaeological and historical resources within the area from previous studies. These include prehistoric sites along SR-85; historical SR-85 and Gila Bend Canal; the Butterfield Stagecoach route in the southernmost PV generation facility area; and a segment of the 1,200-mile-long Juan Bautista de Anza National Historic Trail, which extends west to east approximately 4,000 feet south of the PV generation facility areas and would be crossed by the gen-tie (**Figure 2**). The Project is exploring the feasibility of collocating the gen-tie crossing of the National Historic Trail with existing developments, such as Old U.S. Highway 80 and the adjacent transmission line, or with the existing utility corridor approximately 1 mile east of the Project area.

The Applicant will complete a Class III cultural resource inventory of the Project area, as required for BLM's review under NEPA. If sensitive archaeological or historical sites are found, the Project would avoid impacts or mitigate impacts, as feasible.

As part of their Government-to-Government obligations under the NHPA, Executive Order 13175 and the Memorandum on Tribal Consultation and Strengthening Nation-to-Nation Relationships (January 26, 2021), the BLM is anticipated to consult with the following tribes regarding this Project: Gila River Indian Community, Salt River Pima-Maricopa Indian Community, Ak-Chin Indian Community, Tohono O'odham Nation, Hopi Tribe, Pueblo of Zuni, Yavapai-Prescott Indian Tribe, Yavapai-Apache Nation, Ft. McDowell Yavapai Nation, Colorado River Indian Tribes, Fort Mojave Indian Tribe, Fort Yuma-Quechan Tribe, and

the Cocopah Indian Tribe. Input from the results of cultural resources surveys and consultation would be addressed and incorporated into project design considerations, as appropriate.

6.4 Air Quality

The project study area is located within a non-attainment area for Ozone (O₃) and particulate matter (PM-10) (ADEQ 2022). Although fugitive dust and automobile exhaust emissions could increase during construction, impacts to air quality would be temporary and eliminated upon construction completion. Impacts during the construction duration would be reduced through watering or other dust control measures to ensure compliance with Maricopa County Air Quality Department Rule 310 and as stipulated in the required county earth moving permit. Additional measures may be determined through the course of the NEPA process.

6.5 Geology and Soils

The Project area comprises seven (7) different Soil Map Units and are listed in **Table 3** and **Appendix C** (NRCS 2023). The dominant Soil Map Unit of the Project area is Gunsight-Rillito-Carrizo complex, 1 to 15 percent slopes and Why-Carrizo complex, 0 to 3 percent slopes. Gunsight-Rillito-Carrizo complex, 1 to 15 slopes constitutes a total of 64.1%, or 1,518 acres, of the project area and is characterized as a somewhat excessively drained and gravelly sandy loam soil with a mixed alluvium parent material. Why-Carrizo complex, 0 to 3 percent slopes constitutes a total of 24.6%, or 582.5 acres, of the project area and is characterized as a somewhat excessively drained sandy loam and gravelly sandy loam soil with a parent material derived from mixed stratified alluvium.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. Denure gravelly fine sandy loam, a somewhat excessively drained gravelly sandy loam soil, is considered prime farmland *if irrigated*. This Soil Map Unit constitutes 1.3%, or 31.3 acres of the project area. The Project area is currently not irrigated, and historical aerial imagery does not indicate past irrigation activities within the Project area; therefore, no prime farmland soils are located within the Project area. Why-Carrizo complex, 0 to 3 percent slopes, a somewhat excessively drained sandy loam soil, is considered a farmland of unique importance. This Soil Map Unit constitutes 24.6%, or 582.5 acres of the project area. Aerial imagery does not indicate any agriculture or artificial irrigation activities within the project area; however, there are agricultural activities observed in neighboring plots and there are National Hydrography Dataset (NHD) and National Wetlands Inventory (NWI) mapped features on site. There are no hydric soils mapped within the project area.

Table 3. Soil Map Units within the Project Area

Map Unit Symbol	Map Unit Name	Acers in AOI	Percent of AOI
6	Carrizo-Momoli complex, 0 to 3 percent slopes	31.3	1.3%
17	Denure gravelly fine sandy loam, 1 to 3 percent slopes	55.8	2.4%
21	Denure-Rillito-Why complex, 1 to 5 percent slopes	175.4	7.4%
33	Gunsight-Ajolito extremely gravelly sandy loams, 1 to 15 percent slopes	1.3	0.1%
34	Gunsight-Chuckawalla complex, 1 to 15 percent slopes	2.6	0.1%

Map Unit Symbol	Map Unit Name	Acers in AOI	Percent of AOI
37	Gunsight-Rillito-Carrizo complex, 1 to 15 percent slopes	1,518.0	64.1%
67	Why-Carrizo complex, 0 to 3 percent slopes	582.5	24.6%

No significant paleontological resources are known to occur in either the Lower Sonoran or Sonoran Desert National Monument (BLM 2012b). Appropriate BMPs will be developed as part of the NEPA process, and would be followed during construction, should any inadvertent discoveries of paleontological resources occur.

Impacts to geologic resources and soils will be addressed in the NEPA document and, if appropriate, BMPs and minimization measures will be developed.

6.6 Aquatic Resources

The subject property is located within the Gila Bend Basin, within the Lower Gila-Painted Rock Reservoir Hydrologic Unit Code (HUC) 15070101. The Gila Bend Basin includes 1,284 square miles within Maricopa County and consists of a wide, gently sloping alluvial plain surrounded by rugged desert mountains (ADEQ 2015). There are no perennial streams in the basin. All washes are dry and flow only after heavy precipitation. The basin is drained by the Gila River that enters from the north at Gillespie Dam. After a 36-mile stretch, the Gila River exits the basin at Painted Rock Reservoir, a flood control structure built in 1960, which can hold 4.8 million acre-feet at maximum storage. The Gila River above Gillespie Dam is perennial, which is the result of regulated discharges by Phoenix-area wastewater treatment facilities, upstream drainage wells, and irrigation returns (ADEQ 2015).

All surface water from the Gila River is normally diverted for irrigation use into the eight mile Enterprise Canal on the west side of Gila River, and the 35-mile Gila Bend Canal on the east side of Gila River. Gillespie Dam diverted water from 1921 until it was breached during record flooding in 1993. Since then, pumps are used to lift water trapped by a diversion dike just below the remnants of Gillespie Dam into the canals, both of which have their flows supplemented by groundwater pumped by large capacity wells (ADEQ 2015). Downstream leakage from the diversion dike creates a short stretch of intermittent flow in the uppermost reach of the Gila River within the basin. Groundwater in the basin is contained in alluvial deposits that can be divided into younger alluvial (or upper basin fill) and older alluvial (or lower basin fill) units. These are considered to be a single aquifer because the units are hydrologically connected and both contribute water to wells. The basin fill north of Gila Bend is relatively thin; to the west of town it's much thicker and contains greater amounts of groundwater. Groundwater is predominantly pumped for irrigation purposes with minor amounts used for public water, domestic, industrial, and stock uses.

Based on a desktop review of the National Wetlands Inventory (NWI) and National Hydrography Dataset (NHD), numerous unnamed drainages (washes) cross the Project area, generally in an east-to-west flow direction. (see **Appendix C**). These include ephemeral drainages, canals and ditches, and washes. In addition, the Gila Bend Canal, a concrete lined irrigation canal, bisects the center of the Project area but does not intersect any generation facility areas (**Appendix C**).

The onsite dry washes are considered potentially jurisdictional Waters of the U.S. (WOTUS) based on an order issued vacating and remanding the Navigable Waters Protection Rule (effective August 30, 2021). However, the U.S. Supreme Court decision on May 25, 2023, in *Sackett v. EPA*, narrows the federal Clean Water Act (CWA) in a manner that may render these features non-jurisdictional. The Environmental

Protection Agency and USACE plan to issue further guidance on September 1, 2023. Clean Water Act Section 404/401 permitting requirements will be determined during the NEPA process. Section 402 permitting would be required through the Arizona Department of Environmental Quality (ADEQ). Construction activities associated with the project would impact more than one acre; therefore, compliance with the Arizona Pollutant Discharge Elimination System would be required. Best management practices would be implemented to ensure water quality objectives are met. Field delineations are scheduled to be completed in fall 2023.

Most of the Project area has a 0.2% annual chance of flood hazard and lies within Federal Emergency Management Agency (FEMA) Flood Zone X. Flood Zone X is considered a moderate to low-risk flood area. There are small pockets of the Project area that lie within Flood Zone AO and Flood Zone AE. Flood Zone AO is considered a high-risk river or stream flood area with a 1% or greater chance of shallow flooding each year. Flood Zone AE is considered a high-risk flood zone within with 1% chance of annual flooding.

6.7 Visual Resources

In rank order, BLM visual resource management (VRM) classes range from the most stringent, Class I, to the least restricted, Class IV. The 2012 Lower Sonoran RMP designated the Project area as VRM Class III, and some as Class IV. The currently existing conditions would be slightly altered by the Project, but the Project is anticipated to be consistent with the VRM designations. With BLM's input, Southwest Crossroads Solar, LLC will select and analyze key view observation points (KOPs) of the project on finished grade using three-dimensional (3-D) photo simulations. The 3-D simulations will include existing site photographs as background images and true-scale 3-D models for the proposed project rendered onto the existing photographs to evaluate the visual impacts of the project on the surrounding area. In addition to the visual simulations, a viewshed analysis will be conducted to identify potential sensitive receptors, including tribal and cultural resources, that would be located within the viewshed of the project site.

6.8 Socioeconomics and Population

Most of the Project area lies within a predominantly agricultural area dotted with new solar developments in the Town of Gila Bend. Irrigated agriculture is historically the area's most important economic activity. Alfalfa, cotton, and small grain crops have recently been augmented by new agricultural operations such as dairies and a fish farm and related industry such as a digester that processes waste from dairy operations. Other important economic contributors in the basin include military facilities, power plants, a prison, and Gila Bend's historic role as a service center for travelers (ADEQ 2015)

The impacts of the proposed project on socioeconomics, demographics and environmental justice will be analyzed as part of the NEPA process.

6.9 Aviation Conflicts

Lakeside Airport (AZ05), a small privately owned airport, is located approximately 0.3 mile northwest of the nearest fence of the Generation facility area. The Gila Bend Municipal Airport is located approximately 2.4 miles south of the Project generation facilities and 0.9 mile southeast of the gen-tie line. The Gila Bend Air Force Auxiliary Airport is located approximately 5.5 miles south of the Project. Additionally, the Barry M Goldwater Range is located approximately 5.5 miles south and farther west of

the Project area, which provides airspace training ground for Luke Air Force Base, which is over 50 miles northeast of the Project.

The Project gen-tie line structures would be 200 feet tall, or less, and would generally not require notice under Federal Aviation Administration (FAA) requirements, including FAA Notice of Proposed Construction or Alteration in 14 CFR Part 77. However, the close proximity of airports to the project suggests infrastructure design associated with the gen-tie line may require additional coordination to ensure no hazard to airspace and will be assessed against the Part 77 standards as part of project planning efforts.

The Project generation facility itself would be low-profile, and assessment of potential glint/glare impacts on the nearby airports is not anticipated to be needed as the PV modules proposed for use in the project are black and absorb over 90 percent of the light received. The glare from reflected sunlight is generally not a concern, and PV modules have been installed at numerous airports.

6.10 Other Uses of Project Site

The northernmost part of the proposed generation facility area spans SR-85 and the associated Arizona Department of Transportation (ADOT) held State Highway ROW easement. Coordination with ADOT would be an important component of project planning. Additionally, Project collector lines and the gen-tie would cross the Gila Bend Canal. The proposed generation facility areas would be set back from the canal. The easement for the canal is held by the Paloma Irrigation and Drainage District. Again, coordination with the district would be an important component of project planning to address any encroachment and development concerns.

No known active grazing permits are maintained in the Project area. The gen-tie line would span several easements, including a ROW held by the Southern Pacific Transportation Company. East of the Project area, the Liberty to Gila Bend transmission corridor is a locally designated corridor that is a mile wide. There are several transmission line ROWs within/just east of that corridor. Coordination with the County regarding the corridor will occur as part of project planning and alternatives development.

7. LITERATURE CITED

- Arizona Department of Environmental Quality (ADEQ). 2021. eMaps. Accessed at <http://gisweb.azdeq.gov/arcgis/emaps/>
- ADEQ 2015. Ambient Groundwater Quality of the Gila Bend Basin. June 2015. Publication Number: FS-15-05. Accessed at: https://legacy.azdeq.gov/environ/water/assessment/download/gila_bend_factsheet.pdf
- Arizona Game and Fish Department (AZGFD). 2012. The Maricopa County Wildlife Connectivity Assessment: Report on Stakeholder Input. In partnership with the Arizona Wildlife Linkages Workgroup.
- AZGFD 2022a. Arizona Game and Fish Department. Environmental Online Review Tool Report (OERT). Report generated 6/2/2022.
- AZGFD 2022b. Arizona Game and Fish Department. HabiMap. Online sensitive species mapping database of Project Area. <https://ert.azgfd.gov/content/map>. Accessed June 2022.
- . 2021. Arizona's Online Environmental Review Tool. <https://ert.azgfd.gov/>.
- Brown, David E. 1994. Biotic Communities. Southwestern United States and Northwestern Mexico. Bureau of Land Management (BLM). 2008. Bureau of Land Management - National Environmental Policy Act Handbook (H-1790-1).
- . 2012. Lower Sonoran Record of Decision & Approved Resource Management Plan. BLM/AZ.PL-12.007. Available at https://eplanning.blm.gov/public_projects/lup/11856/40127/42156/01-LSDA_ROD-ARMP_FINAL_2012-09-19_web-with-Links_sans-map-pages.pdf. Accessed March 31, 2021.
- . 2017. Bureau Sensitive Species List. Available at: <https://www.blm.gov/sites/blm.gov/files/policies/AZ-IM-2017-009-a1.pdf>. Accessed March 31, 2021.
- . 2018. Permanent Instruction Memorandum 2018-23 *Analysis of Connected Actions under the National Environmental Policy Act*. Available at: <https://www.blm.gov/policy/pim-2018-023>. Accessed March 12, 2021.
- . 2020a. Plan of Development Outline for High-Voltage Electric Transmission Lines. Available at: https://www.blm.gov/sites/blm.gov/files/policies/Attachment-1_Plan-of-Development_mitigation%20%281%29.pdf. Accessed March 31, 2021.
- . 2020b. Renewable Energy. Available at: <https://www.blm.gov/programs/energy-and-minerals/renewable-energy>. Accessed March 31, 2021.

- _____. 2023. BLM Webpage Desctibing Special Planning Designations. <https://www.blm.gov/programs/planning-and-nepa/planning-101/special-planning-designations/acec>. Accessed July 17, 2023.
- FEMA 2022. Federal Emergency Management Area (FEMA) National Flood Hazard Layer (NFHL) Viewer. <https://www.fema.gov/flood-maps/national-flood-hazard-layer> Accessed June 2022.
- National Wetlands Inventory. 2021. <https://www.fws.gov/wetlands/data/mapper.html>
- NRCS 2023. Natural Resources Conservation Service. Soil Map of Project area within Maricopa County area, Arizona. <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>. Accessed July 2023. *Included in Appendix C.*
- Tonn, Sabra 2022. Arizona Game and Fish Department HDMS Program Supervisor. Email communication 6/2/2022.
- USFWS 2022. U.S. Fish and Wildlife Service. Information for Planning and Consultation (IPaC). Informal IPaC of Project Area from online database.
- United States Geological Survey (USGS). 2017. Geologic Maps of US states. <https://mrdata.usgs.gov/geology/sta>

Appendix C

Biological Resources Memorandum

December 22, 2022

Deron Lawrence
 Senior Director, Natural Resources Permitting & Policy
 Longroad Energy Management, LLC
deron.lawrence@longroadenergy.com

**Re: Biological Resources and Section 404/401 of the Clean Water Act Memorandum
 Southwest Crossroads Solar Project (2,588.2 acres)
 Gila Bend, Maricopa County, Arizona**

Dear Mr. Lawrence:

Longroad Energy Management, LLC is proposing a solar photovoltaic and battery storage and associated generation interconnection project located along State Route (SR) 85 in Gila Bend, Maricopa County, Arizona. The 2,588.2-acre site consists of Bureau of Land Management (BLM) lands, Arizona State Land Department (ASLD) lands, private lands, and Arizona Department of Transportation (ADOT) easement on BLM lands. The site primarily consists of native desert and sparse dirt roads. Portions of SR 85 and Old US 80 also intersect the project limits. The surrounding lands consist of agricultural lands, solar photovoltaic storage facilities, and native desert.

Kimley-Horn biologists conducted a site visit on December 8, 2022 to document onsite conditions. The project limits are within the Lower Colorado River Subdivision of the Sonoran Desertscrub biotic community.¹ Native vegetation observed within the project limits consists of desert ironwood (*Olneya tesota*), blue paloverde (*Parkinsonia florida*), velvet mesquite (*Prosopis velutina*), common hackberry (*Celtis occidentalis*), creosote bush (*Larrea tridentata*), brittlebush (*Encelia farinosa*), fourwing saltbush (*Atriplex canescens*), triangle bur ragweed (*Ambrosia deltoidea*), redroot amaranth (*Amaranthus retroflexus*), and desert globemallow (*Sphaeralcea ambigua*). Noxious and invasive plant species observed included crimson fountaingrass (*Pennisetum setaceum*).

Wildlife observed included red-tailed hawk (*Buteo jamaicensis*) and coyote (*Canis latrans*).

SPECIES IDENTIFICATION

Kimley-Horn obtained an official species list from the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) system on June 2, 2022. The list included five threatened, endangered or candidate species that should be evaluated. A qualified biologist reviewed the list to determine species that may occur in the project vicinity. Species included in the USFWS list but excluded from further evaluation are addressed in **Table 1**. This project will have no effect on the species listed in **Table 1**. Additionally, there is no federally designated Critical Habitat within the project vicinity.

Table 1 – ESA Species Exclusion Table

Species	Status	Habitat Requirements	Exclusion Justification
Mammals			
Sonoran Pronghorn (<i>Antilocapra americana sonoriensis</i>)	ESA XN	Broad intermountain alluvial valleys with creosote-bursage and palo verde-mixed cacti	Suitable habitat for this species is not present in the project area and the project limits are outside the historic, present,

¹ Conservation Biology Institute (CBI). Data Basin. Accessed December 12, 2022.
<https://databasin.org/datasets/e8e241e869054d7e810894e5e993625e/>

Table 1 – ESA Species Exclusion Table (continued)

Species	Status	Habitat Requirements	Exclusion Justification
		associations at elevations below 650 feet. ²	and potential distribution range for this species. No individuals were identified within five miles of the project limits by Arizona Department of Game and Fish (AGFD) species occurrence data.
Birds			
California Least Tern (<i>Sterna antillarum browni</i>)	ESA LE	Sparsely vegetated and exposed flats, typically along the shorelines of inland rivers, lakes, reservoirs, or drainage systems below 2,000 feet. ²	Suitable habitat for this species is not present in the project area and the project limits are outside the historic, present, and potential distribution range for this species. No individuals were identified within five miles of the project limits by AGFD species occurrence data.
Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)	ESA LT	Large blocks of riparian woodlands (cottonwood, willow, or tamarisk galleries) below 6,500 feet. ²	Suitable habitat for this species is not present in the project area. The project limits are within the historic, present, and potential distribution range for this species; however, no individuals were identified within five miles of the project limits by the AGFD species occurrence data.
Yuma Ridgway's Rail (<i>Rallus obsoletus yumanensis</i>)	ESA LE	Fresh water and brackish marshes with dense emergent riparian vegetation below 4,500 feet. ²	Suitable habitat for this species is not present in the project area and the project limits are outside the historic, present, and potential distribution range for this species. No individuals were identified within five miles of the project limits by the AGFD species occurrence data.
Insects			
Monarch Butterfly (<i>Danaus plexippus</i>)	ESA C	Open grasslands and meadows consisting of a variety of flowering plants. Particularly drawn toward milkweed. ³	Suitable habitat for this species is not present in the project limits. No individuals were identified within five miles of the project limits by the AGFD species occurrence data.
Status Definitions: ESA = Endangered Species Act; LE = Listed Endangered, LT = Listed Threatened, C = Candidate, XN = Experimental Nonessential population			

² USFWS Quick Reference Guide to all Arizona Species (04/28/16). Accessed December 12, 2022.

<https://www.fws.gov/southwest/es/arizona/Documents/MiscDocs/AZSpeciesReference.pdf>

³ USFWS Environmental Conservation Online System (ECOS). Monarch Butterfly (*Danaus plexippus*). Accessed December 12, 2022. <https://ecos.fws.gov/ecp/species/9743>

Kimley-Horn accessed the AGFD Online Environmental Review Tool (OERT) Report on June 2, 2022. The AGFD OERT listed western burrowing owl (*Athene cunicularia hypugaea*), resplendent shovel-nosed snake (*Chionactis annulata*), Sonoran Desert tortoise (*Gopherus morafkai*), and cave myotis (*Myotis velifer*) within five miles of the project vicinity.

Western Burrowing Owl (*Athene cunicularia hypugaea*)

The western burrowing owl is listed as a species of concern (SC) by the USFWS, a sensitive species by BLM, and as a Tier 1B Species of Greatest Conservation Need (SGCN) by the AGFD. They are also protected federally by the Migratory Bird Treaty Act (MBTA) and Arizona state law (ARS Title 17). According to the AGFD, the western burrowing owl utilizes well-drained grasslands, steppes, deserts, prairies, and agricultural lands, often associated with burrowing mammals. The western burrowing owl utilizes well-drained grasslands, steppes, deserts, prairies, and agricultural lands, often associated with burrowing mammals. Western burrowing owls are known to occupy vacant lots near human habitation, golf courses, or airports.⁴

According to AGFD species occurrence data, historic, present, and potential distribution for the western burrowing owl is located within the project limits. The nearest occurrence of the western burrowing owl is approximately 2.4 miles southwest of the project limits (Sabra Tonn, AGFD, pers. Comm. 2022). During field reconnaissance, no western burrowing owls were observed; however, suitable burrowing owl habitat was observed within the project limits. Environmental commitments will be required to avoid impacts.

Contractor Responsibilities:

- **Prior to construction, all personnel who will be on-site, including, but not limited to, contractors, Contractors' employees, supervisors, inspectors, and subcontractors shall review the attached "Western Burrowing Owl Awareness" flyer.**
- **If any burrowing owls or active burrows are identified, the contractor shall notify the Developer immediately. No construction activities shall take place within 100 feet of any active burrow.**
- **If the Developer in cooperation with the Biologist determines that burrowing owls cannot be avoided, the contractor shall employ a qualified biologist holding a permit from the USFWS to relocate burrowing owls from the project area, as appropriate.**

Resplendent Shovel-nosed Snake (*Chionactis annulata*)

The resplendent shovel-nosed snake is a sensitive species by BLM and a Tier 1C SGCN by AGFD. Resplendent shovel-nosed snakes typically inhabit intermontane valleys in the Lower Colorado River Valley Subdivision from near sea level to 2,460 feet. This species is associated with sandy washes, xeroriparian habitats, dunes in desert flats, or on gently sloping bajadas, often with little vegetation.⁵

According to AGFD species occurrence data, historic, present, and potential distribution for the resplendent shovel-nosed snake is not located within the project limits; however, the nearest occurrence of the resplendent shovel-nosed snake is within the project limits (Sabra Tonn, AGFD, pers. Comm. 2022). Mitigation measures are not required for the species.

⁴ Arizona Game and Fish Department (AGFD). 2001. *Athene cunicularia hypugaea*. Unpublished abstract compiled and edited by the Heritage Data Management System, AGFD, Phoenix, AZ. 10 pp.

⁵ AGFD. 2021. *Chionactis annulata*. Unpublished abstract compiled and edited by the Heritage Data Management System, AGFD, Phoenix, AZ. 6 pp.

Sonoran Desert Tortoise (*Gopherus morafkai*)

The Sonoran Desert tortoise is protected under a Candidate Conservation Agreement (CCA), is a sensitive species by BLM, and is a Tier 1A SGCN by AGFD. Sonoran Desert tortoises typically inhabit bajadas and steep, rocky slopes of Mojave Desertscrub and Sonoran Desertscrub at elevations between 900 and 4,200 feet.⁶ Desert tortoises most often occur in paloverde-mixed cacti areas with boulders, rocky outcrops, and natural ground cavities nearby. The Sonoran Desert tortoise also utilizes inter-mountain valleys for dispersal at all life stages. Incised washes are important for sheltering in lower elevation habitat.⁷

According to AGFD species occurrence data, historic, present, and potential distribution for the Sonoran Desert tortoise is not located within the project limits. The nearest occurrence of the Sonoran Desert tortoise is approximately 3.1 miles east of the project limits in the foothills of the Maricopa Mountains (Sabra Tonn, AGFD, pers. Comm. 2022). There is no suitable shelter habitat; however, there is suitable dispersal habitat within the project limits; therefore, a mitigation measure is required.

Contractor Responsibility:

- **If any Sonoran Desert tortoises are encountered during construction, the contractor shall adhere to the Arizona Game and Fish Department “Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects” revised September 22, 2014.**

Cave Myotis (*Myotis velifer*)

The cave myotis is a USFWS SC and is a Tier 1B SGCN by AGFD. This species roosts in caves, tunnels, mineshafts, under bridges, and occasionally buildings with a water source nearby. In Arizona, winter roosts consist of wet mine tunnels above 6,000 feet.⁸

According to AGFD species occurrence data, historic, present, and potential distribution for the cave myotis is located within the project limits. The nearest occurrence of the cave myotis is approximately 4 miles south of the project limits in the Town of Gila Bend (Sabra Tonn, AGFD, pers. Comm. 2022). There is no suitable roosting habitat within the project limits; therefore, mitigation measures are not required.

WILDLIFE CONNECTIVITY

Wilderness areas and wildlife areas/refuges are important natural resources because they provide food, shelter, and other habitat requirements (including connectivity) to sustain many species of wildlife. Numerous wildlife species, including mule deer, javelina, coyotes, bighorn sheep, Sonoran Desert tortoise, multiple bird species, and mountain lions may utilize the washes and undeveloped uplands within the study area to move between wildland habitats. Multiple species utilize the open spaces and undeveloped areas for foraging and/or shelter. One wildlife movement area was identified from the Wildlife Connectivity Assessment as crossing through the project limits. The Gila Bend - Sierra Estrella Linkage Design wildlife movement area is located within the project limits. Species identified in this movement area consist of bighorn sheep, bobcat, javelina, mountain lion, mule deer, Sonoran Desert tortoise, and Gila monster.⁹

⁶ USFWS. 2015. *Gopherus morafkai*. Species Status Assessment for the Sonoran Desert Tortoise. Version 1.0, September 2015. US Fish and Wildlife Service, Southwest Region, Albuquerque, NM.

⁷ AGFD. 2015. *Gopherus morafkai*. Published abstract compiled and edited by the Heritage Data Management System, AGFD, Phoenix, AZ. 10 pp.

⁸ AGFD. 2002. *Myotis velifer*. Published abstract compiled and edited by the Heritage Data Management System, AGFD, Phoenix, AZ. 7 pp.

⁹ Beier, Paul, et. al. 2008. *Gila Bend – Sierra Estrella Linkage Design*. Arizona Missing Linkages.

MIGRATORY BIRD TREATY ACT

Migratory birds may nest on the ground, on structures, or in trees, shrubs, or other vegetation within the project limits. No nests were observed during field reconnaissance; however, trees, shrubs, and groundcover suitable for nesting will be removed during construction. The following mitigation measure should be implemented:

Contractor Responsibility:

- **If vegetation clearing will occur during the migratory bird breeding season (March 1 - August 31), the contractor shall avoid any active bird nests. If the active nests cannot be avoided, the contractor shall notify the Engineer to evaluate the situation. During the non-breeding season (September 1 - February 28) vegetation removal is not subject to this restriction.**

PROTECTED NATIVE PLANTS

Protected plants located within the project limits include desert ironwood, blue paloverde, and velvet mesquite. Native plants will be removed as part of the project; therefore, the following mitigation measure should be implemented.

Contractor Responsibility:

- **Protected native plants within the project limits may be impacted by this project; therefore, Longroad Energy Management, LLC will determine if Arizona Department of Agriculture notification is needed. If notification is needed, Longroad Energy Management, LLC will send the notification at least 60 (sixty) calendar days prior to the start of construction.**

SECTION 404/401 OF THE CLEAN WATER ACT

The U.S. Army Corps of Engineers (Corps) regulates the discharge of dredge and/or fill material into Waters of the U.S. (WOTUS) under Section 404 of the Clean Water Act (CWA) (33 U.S.C. §1251 et seq. (1972). Any activity that will discharge dredge or fill material into jurisdictional waters, including wetlands, will require a CWA Section 404 Permit [either a Nationwide Permit (NWP) or an Individual Permit (IP)]. These activities include, but are not limited to, the installation of mass grading, riprap, channel maintenance activities, bank protection, new bridges or extensions of bridges, corrugated metal pipes, and box culverts.

The project limits include numerous unnamed drainages that flow west towards the Gila River. The drainages within the study area are ephemeral, meaning they only have flows in response to stormwater runoff from contributing watersheds.

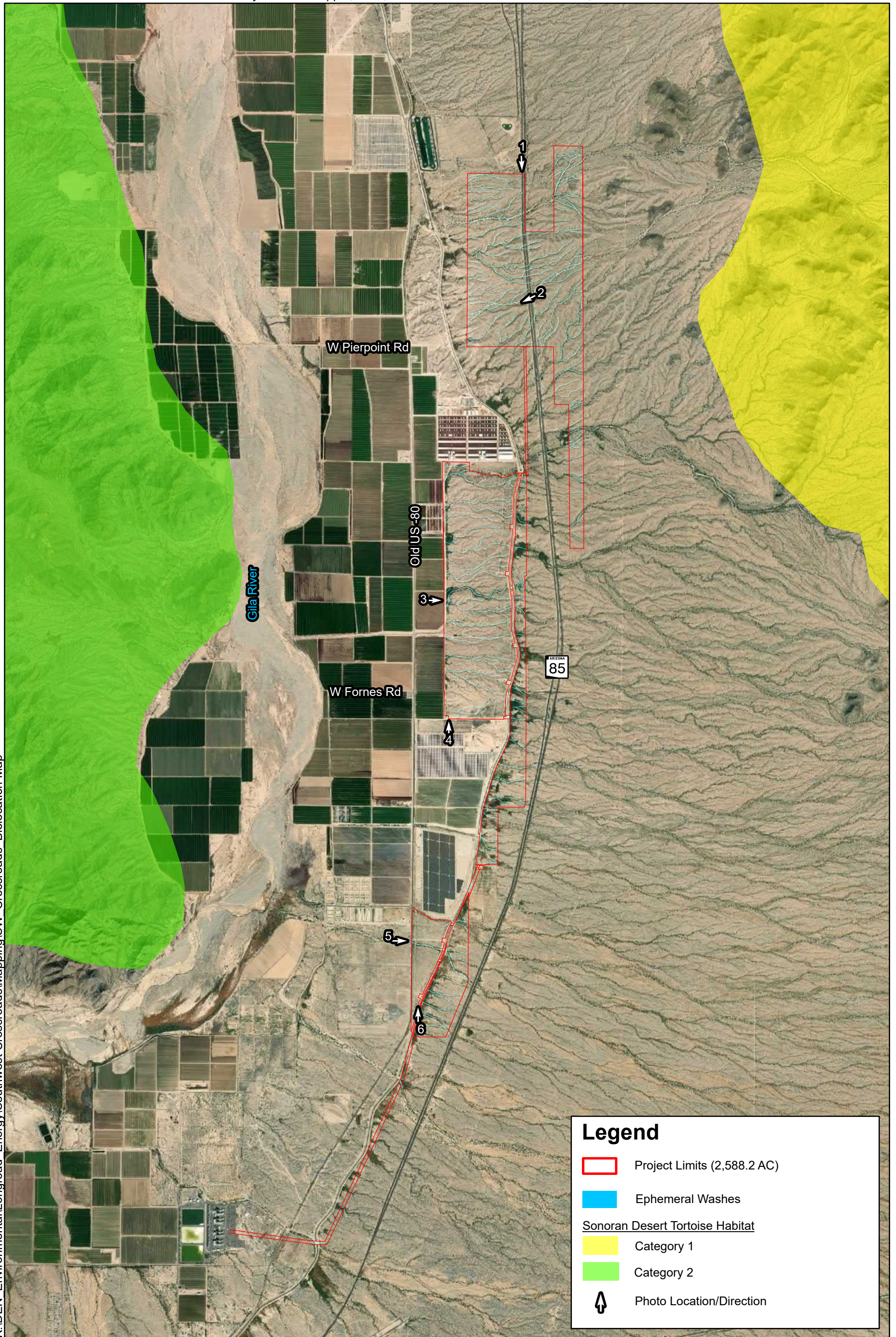
While no currently approved jurisdictional delineations are known to exist in the project limits and a Freedom of Information Act (FOIA) request was beyond this scope of work, it is anticipated that several of the unnamed washes in the study area could be determined to be potentially jurisdictional WOTUS by the Corps. An evaluation to determine boundaries of WOTUS should be conducted during the design phase of the project through a Preliminary Jurisdictional Determination (PJD) or an Approved Jurisdictional Determination (AJD) to aid in avoiding and minimizing impacts to the WOTUS. A PJD is a non-binding delineation that is typically pursued in the planning and design phases of a project. An AJD is a delineation that is binding for five years that requires more data and processing time through the Corps. After the delineation is complete, the project should be designed to avoid and minimize impacts to WOTUS. If there are unavoidable impacts to WOTUS, a Section 404/401 permitting will then be required along with potential compensatory mitigation activities for the proposed impacts to WOTUS. Applications for determination of

WOTUS and for Section 404/401 permits on ASLD and BLM land will require review and concurrence from the respective agencies prior to submittal to the Corps.

Attachments

- Figure 1. Photo Locations Map
- Ground Photographs
- USFWS IPaC
- AGFD OERT and Agency Correspondence
- Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects
- "Western Burrowing Owl Awareness" Flyer

K:\DEN Environmental\Longroad Energy\Southwest Crossroads\Mapping\SW Crossroads Biolocation Map



Legend

- Project Limits (2,588.2 AC)
- Ephemeral Washes
- Sonoran Desert Tortoise Habitat**
 - Category 1
 - Category 2
- Photo Location/Direction

Photo No. 1



View from the northern portion of the project limits looking south along State Route (SR) 85.

Photo No. 2



View from the northern portion of the project limits looking downstream in a typical ephemeral wash (potential Waters of the U.S. (WOTUS)).

Ground Photographs

Southwest Crossroads
2,588.2-Acre Project Area
Maricopa County, Arizona

December 8, 2022

196439002

Photo No. 3



View from the central portion of the project limits looking east towards typical desert scrub habitat (Lower Colorado River Subdivision).

Photo No. 4



View from the central portion of the project limits looking north towards typical desert scrub habitat (Lower Colorado River Subdivision).

Ground Photographs

Southwest Crossroads
2,588.2-Acre Project Area
Maricopa County, Arizona

December 8, 2022
196439002

Photo No. 5



View from the southern portion of the project limits looking east across Old US 80 and looking upstream in typical ephemeral wash (potential WOTUS).

Photo No. 6



View from the southern portion of the project limits looking north along Old US 80. Note existing transmission lines.

Ground Photographs



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



In Reply Refer To:
 Project Code: 2022-0049420
 Project Name: SW Crossroads

June 02, 2022

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.

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

Project Summary

Project Code: 2022-0049420
 Event Code: None
 Project Name: SW Crossroads
 Project Type: New Constr - Above Ground
 Project Description: Energy development
 Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@33.0563066,-112.65626293257233,14z>



Counties: Maricopa County, Arizona

Endangered Species Act Species

There is a total of 5 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 Fisheries¹, 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
Sonoran Pronghorn <i>Antilocapra americana sonoriensis</i> Population: U.S.A. (AZ), Mexico No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4750	Experimental Population, Non-Essential

Birds

NAME	STATUS
California Least Tern <i>Sterna antillarum browni</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered
Yellow-billed Cuckoo <i>Coccyzus americanus</i> Population: Western U.S. DPS There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened
Yuma Ridgway's Rail <i>Rallus obsoletus yumanensis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3505	Endangered

Insects

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



Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

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
Willet <i>Tringa semipalmata</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere

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.

■ probability of presence ■ breeding season | survey effort — no data

SPECIES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC



Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.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.

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.

WETLAND INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE VISIT [HTTPS://WWW.FWS.GOV/WETLANDS/DATA/MAPPER.HTML](https://www.fws.gov/wetlands/data/mapper.html) OR CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

IPaC User Contact Information

Agency: Kimley-Horn
Name: Jesse Carlson
Address: 380 Interlocken Crescent Suite 100
City: Broomfield
State: CO
Zip: 80021
Email: jesse.carlson@kimley-horn.com
Phone: 2532982432

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:

SW Crossroads

Project Description:

Proposed solar project

Project Type:

Energy Storage/Production/Transfer, Energy Production (generation), photovoltaic solar facility (new)

Contact Person:

Jesse Carlson

Organization:

Kimley-Horn

On Behalf Of:

OTHER

Project ID:

HGIS-16463

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:

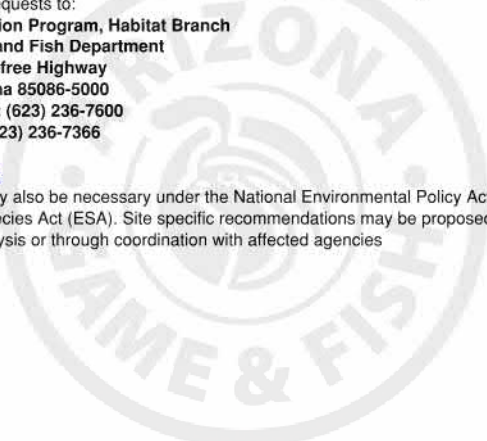
Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Report is solely responsible for the project location and thus the correctness of the Project Review Report content.

Recommendations Disclaimer:

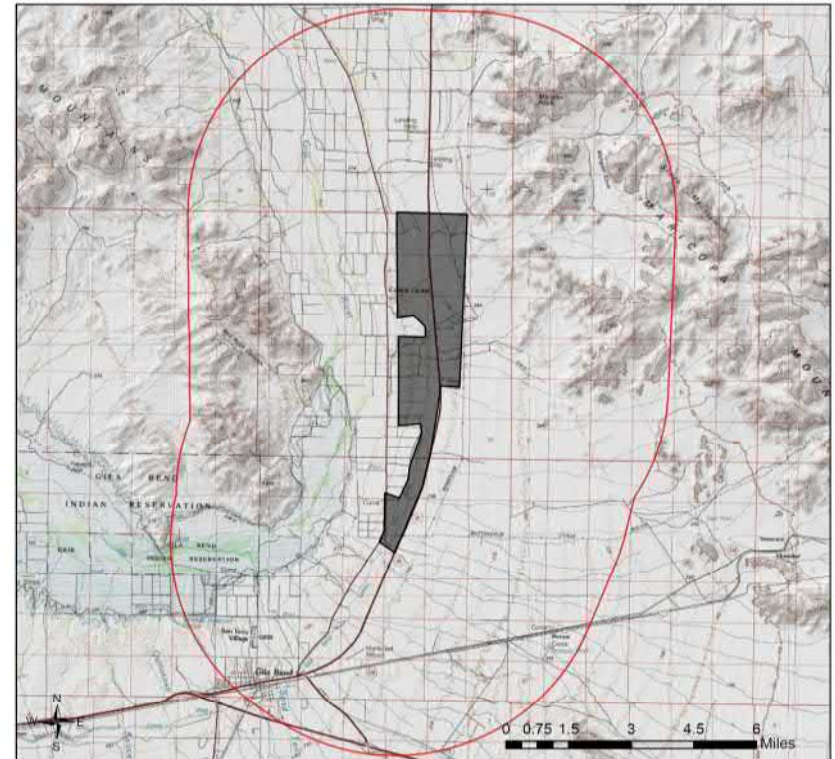
1. The Department is interested in the conservation of all fish and wildlife resources, including those species listed in this report and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.
2. Recommendations have been made by the Department, 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

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



SW Crossroads
USA Topo Basemap With Locator Map



Buffered Project Boundary
 Project Boundary

Project Size (acres): 5,563.04
Lat/Long (DD): 33.0711 / -112.6499
County(s): Maricopa
AGFD Region(s): Yuma
Township/Range(s): T4S, R4W; T5S, R4W
USGS Quad(s): COTTON CENTER; GILA BEND

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatasytretsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community



SW Crossroads
 Web Map As Submitted By User

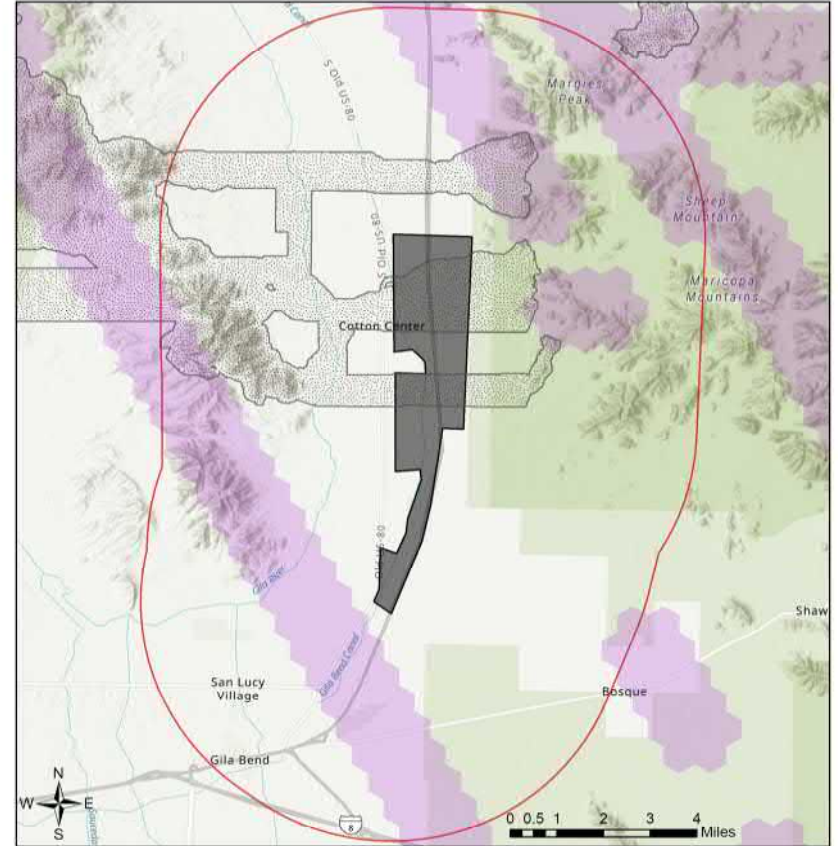


- Buffered Project Boundary
- Project Boundary

Project Size (acres): 5,563.04
 Lat/Long (DD): 33.0711 / -112.6499
 County(s): Maricopa
 AGFD Region(s): Yuma
 Township/Range(s): T4S, R4W, T5S, R4W
 USGS Quad(s): COTTON CENTER, GILA BEND

Sources: Esri, DeLorme, GeoEye, IGN, AerGRID, AIR, IGN, and the GIS User Community

SW Crossroads
 Important Areas

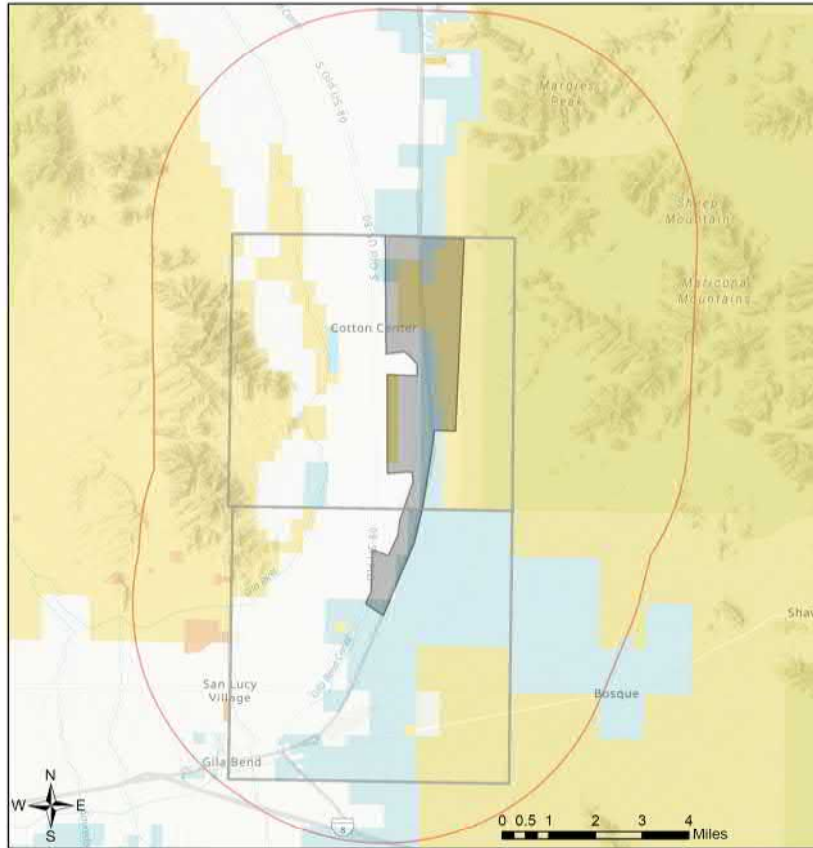


- Buffered Project Boundary
- Project Boundary
- Important Bird Areas
- Critical Habitat
- Pinal County Riparian
- Important Connectivity Zones
- Wildlife Connectivity

Project Size (acres): 5,563.04
 Lat/Long (DD): 33.0711 / -112.6499
 County(s): Maricopa
 AGFD Region(s): Yuma
 Township/Range(s): T4S, R4W, T5S, R4W
 USGS Quad(s): COTTON CENTER, GILA BEND

Sources: Esri, Airbus DS, USGS, NOAA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, GeoBlastsystems, Rijswaterstaat, GISA, Geoland, FEMA, Intermap and the GIS User Community
 Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

SW Crossroads Township/Ranges and Land Ownership



Project Size (acres): 5,563.04
 Lat/Long (DD): 33.0711 / -112.6499
 County(s): Maricopa
 AGFD Region(s): Yuma
 Township/Range(s): T4S, R4W, T5S, R4W
 USGS Quad(s): COTTON CENTER, GILA BEND

Sources: Esri, Artus DS, USGS, NOAA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, HMA, Geobotanystyrien, Rijswaterstaat, OSA, Geoland, FEMA, Intermap and the GIS User Community
 Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Special Status Species Documented within 5 Miles of Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Athene cucularia hypugaea	Western Burrowing Owl	SC	S	S		1B
Chionactis annulata	Resplendent Shovel-nosed Snake					1C
Gopherus morafkai	Sonoran Desert Tortoise	CCA	S	S		1A
Myotis velifer	Cave Myotis	SC		S		1B

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
Gila Bend - Sierra Estrella Linkage Design	Wildlife Connectivity Design					

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
Aquila chrysaetos	Golden Eagle	BGA		S		1B
Botaurus lentiginosus	American Bittern					1B
Buteo regalis	Ferruginous Hawk	SC		S		1B
Calypte costae	Costa's Hummingbird					1C
Castor canadensis	American Beaver					1B
Charadrius nivosus nivosus	Snowy Plover	No Status				1B
Chilomeniscus stramineus	Variable Sandsnake					1B
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 nebricus	Sonoran Collared Lizard					1B
Euderma maculatum	Spotted Bat	SC	S	S		1B
Eumops perotis californicus	Greater Western Bonneted Bat	SC		S		1B
Gopherus morafkai	Sonoran Desert Tortoise	CCA	S	S		1A
Haliaeetus leucocephalus	Bald Eagle	SC, BGA	S	S		1A

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
Heloderma suspectum	Gila Monster					1A
Incilius alvarius	Sonoran Desert Toad					1B
Kinosternon sonoriense sonoriense	Desert Mud Turtle			S		1B
Lasiurus xanthinus	Western Yellow Bat		S			1B
Leptonycteris yerbabuena	Lesser Long-nosed Bat	SC				1A
Lepus alleni	Antelope Jackrabbit					1B
Lithobates yavapaiensis	Lowland Leopard Frog	SC	S	S		1A
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
Ovis canadensis mexicana	Mexican Desert Bighorn Sheep					1B
Passerculus sandwichensis	Savannah Sparrow					1B
Perognathus longimembris	Little Pocket Mouse	No Status				1B
Phrynosoma goodei	Goode's Horned Lizard					1B
Phyllorhynchus browni	Saddled Leaf-nosed Snake					1B
Rallus obsoletus yumanensis	Yuma Ridgway's Rail	LE				1A
Spizella breweri	Brewer's Sparrow					1C
Sturnella magna	Eastern Meadowlark					1C
Tadarida brasiliensis	Brazilian Free-tailed Bat					1B
Toxostoma lecontei	LeConte's Thrasher			S		1B
Troglodytes pacificus	Pacific Wren					1B
Vireo bellii arizonae	Arizona Bell's Vireo					1B
Vulpes macrotis	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
Callipepla gambelii	Gambel's Quail					
Odocoileus hemionus	Mule Deer					

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

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Puma concolor	Mountain Lion					
Zenaidura macroura	White-winged Dove					
Zenaidura macroura	Mourning Dove					

Project Type: Energy Storage/Production/Transfer, Energy Production (generation), photovoltaic solar facility (new)

Project Type Recommendations:

During the planning stages of your project, please consider the local or regional needs of wildlife in regards to movement, connectivity, and access to habitat needs. Loss of this permeability prevents wildlife from accessing resources, finding mates, reduces gene flow, prevents wildlife from re-colonizing areas where local extirpations may have occurred, and ultimately prevents wildlife from contributing to ecosystem functions, such as pollination, seed dispersal, control of prey numbers, and resistance to invasive species. In many cases, streams and washes provide natural movement corridors for wildlife and should be maintained in their natural state. Uplands also support a large diversity of species, and should be contained within important wildlife movement corridors. In addition, maintaining biodiversity and ecosystem functions can be facilitated through improving designs of structures, fences, roadways, and culverts to promote passage for a variety of wildlife. Guidelines for many of these can be found at: <https://www.azgfd.com/wildlife/planning/wildlifeguidelines/>.

Consider impacts of outdoor lighting on wildlife and develop measures or alternatives that can be taken to increase human safety while minimizing potential impacts to wildlife. Conduct wildlife surveys to determine species within project area, and evaluate proposed activities based on species biology and natural history to determine if artificial lighting may disrupt behavior patterns or habitat use. Use only the minimum amount of light needed for safety. Narrow spectrum bulbs should be used as often as possible to lower the range of species affected by lighting. All lighting should be shielded, canted, or cut to ensure that light reaches only areas needing illumination.

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/invvas> 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.

Minimization and mitigation of impacts to wildlife and fish species due to changes in water quality, quantity, chemistry, temperature, and alteration to flow regimes (timing, magnitude, duration, and frequency of floods) should be evaluated. Minimize impacts to springs, in-stream flow, and consider irrigation improvements to decrease water use. If dredging is a project component, consider timing of the project in order to minimize impacts to spawning fish and other aquatic species (include spawning seasons), and to reduce spread of exotic invasive species. We recommend early direct coordination with Project Evaluation Program for projects that could impact water resources, wetlands, streams, springs, and/or riparian habitats.

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 herptofauna (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.

The Department requests further coordination to provide project/species specific recommendations, please contact Project Evaluation Program directly at PEP@azgfd.gov.

Project Location and/or Species Recommendations:

Analysis indicates that your project is located in the vicinity of an identified **wildlife habitat linkage corridor**. The **Arizona Missing Linkages** 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) 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

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/>.



From: [Sabra Tonn](#)
To: [Carlson, Jesse](#)
Subject: Re: OERT HGIS-16463 Inquiry
Date: Thursday, June 2, 2022 4:47:44 PM

Western burrowing owl (*Athene cunicularia hypugaea*) - closest is about 2.4 miles SW of the southernmost part of the project. 2008-05-03: Bird seen flying near likely burrow.

Resplendent shovel-nosed snake (*Chionactis annulate*) - Within project footprint near northern end 1999-09-08 salvaged dead on road. Also 31 records along Maricopa Road from Gila Bend east to the town of Maricopa. Dates range from 1999-2016.

Sonoran desert tortoise (*Gopherus morafkai*) - closest is about 3.7 miles to the west of the project and 3.1 miles to the east. They are found throughout the area in the rocky bajadas and foothills of the mountains. If encountered during the project, please follow the guidelines linked in the ERT report. <https://www.azgfd.com/wildlife/nongamemanagement/tortoise/>

cave myotis (*Myotis velifer*) - about 4 miles south in Gila Bend where a specimen was collected some time before 1986. Also about 14 miles to the NW of the project in a mine north of Woolsey Peak from 1998.

Please let me know if you have any questions.

Sabra

SABRA TONN | HDMS PROGRAM SUPERVISOR
ARIZONA GAME AND FISH DEPARTMENT

OFFICE: 623.236.7618
MOBILE: 602.524.1004
EMAIL: stonn@azgfd.gov

azgfd.gov | 5000 W. Carefree Highway, Phoenix, AZ 85086

Join our new [Conservation Membership](#) program and ensure a wildlife legacy for the future.

On Thu, Jun 2, 2022 at 1:38 PM Carlson, Jesse <Jesse.Carlson@kimley-horn.com> wrote:

Hello Sabra,

I have a question in regards to OERT HGIS-16463. According to the report, Western burrowing owl (*Athene cunicularia hypugaea*), resplendent shovel-nosed snake (*Chionactis annulate*), Sonoran desert tortoise (*Gopherus morafkai*), and cave myotis (*Myotis velifer*) were documented within 5 miles of our project limits. I was hoping you could provide more detailed data on their proximity to our project.

Thank you,

Jesse

Jesse Carlson | Environmental Scientist

Kimley-Horn | 380 Interlocken Crescent, Suite 100; Broomfield CO 80021
Direct: 720-295-6923 | Mobile: 253-298-2432

Connect with us: [Twitter](#) | [LinkedIn](#) | [Facebook](#) | [Instagram](#) | [Kimley-Horn.com](#)

GUIDELINES FOR HANDLING SONORAN DESERT TORTOISES
ENCOUNTERED ON DEVELOPMENT PROJECTS

Arizona Game and Fish Department
Revised September 22, 2014

The Arizona Game and Fish Department (Department) has developed the following guidelines to reduce potential impacts to desert tortoises, and to promote the continued existence of tortoises throughout the state. These guidelines apply to short-term and/or small-scale projects, depending on the number of affected tortoises and specific type of project.

The Sonoran desert tortoise occurs south and east of the Colorado River. Tortoises encountered in the open should be moved out of harm's way to adjacent appropriate habitat. If an occupied burrow is determined to be in jeopardy of destruction, the tortoise should be relocated to the nearest appropriate alternate burrow or other appropriate shelter, as determined by a qualified biologist. Tortoises should be moved less than 48 hours in advance of the habitat disturbance so they do not return to the area in the interim. Tortoises should be moved quickly, kept in an upright position parallel to the ground at all times, and placed in the shade. Separate disposable gloves should be worn for each tortoise handled to avoid potential transfer of disease between tortoises. Tortoises must not be moved if the ambient air temperature exceeds 40°Celsius (105°Fahrenheit) unless an alternate burrow is available or the tortoise is in imminent danger.

A tortoise may be moved up to one-half mile, but no further than necessary from its original location. If a release site or alternate burrow is unavailable within this distance, and ambient air temperature exceeds 40°Celsius (105°Fahrenheit), contact the Department for guidance. Tortoises salvaged from projects which result in substantial permanent habitat loss (e.g. housing and highway projects), or those requiring removal during long-term (longer than one week) construction projects, may be placed in the Department's tortoise adoption program. *Managers of projects likely to affect desert tortoises should obtain a [scientific collecting license](#) from the Department to facilitate handling or temporary possession of tortoises.* Likewise, if large numbers of tortoises (>5) are expected to be displaced by a project, the project manager should contact the Department for guidance and/or assistance.

Please keep in mind the following points:

- Use the Department's [Environmental On-Line Review Tool Department](#) during the planning stages of any project that may affect desert tortoise habitat.
- Unless specifically authorized by the Department, or as noted above, project personnel should avoid disturbing any tortoise.
- Take is prohibited by state law.
- These guidelines do not apply to Mojave desert tortoises (north and west of the Colorado River). Mojave desert tortoises are listed as threatened under the Endangered Species Act, administered by the U.S. Fish and Wildlife Service.
- These guidelines are subject to revision at the discretion of the Department.



Western Burrowing Owl Awareness

The purpose of this flyer is to provide contractors working on projects with basic knowledge to reduce the risk of incidental take of Western Burrowing Owls.

Legal Status:

Western Burrowing Owls (*Athene cunicularia*) are protected under the Federal Migratory Bird Treaty Act of 1918. All migratory birds and their parts are fully protected. They are also protected under Arizona State Law in Title 17-101, Title 17-235, and Title 17-236.

What to look for:

- Description– small, ground-dwelling owl.
- Length– 19.5-25.0 cm (7.68-9.85 inches)
- Wingspan– 58.42 cm (23.0 inches)
- Mass– about 150 grams
- Males are typically slightly larger than females.
- Round head, lacks ear tufts.
- Distinct oval facial ruff, framed by a broad, puffy white eyebrow.
- Eyes contain a bright yellow iris.

Where are owls found?

- Dry, open, short grass, treeless plains.
- Dependent on fossorial mammals. (ground squirrels, prairie dogs, badgers, etc.) to construct burrows.
- Human dominated landscapes: golf courses, airports, agricultural fields.

Identifying an active burrow:

- Owls use burrows constructed by ground squirrels, badgers, coyotes and tortoises. They can also use pipes, culverts, and ditches.
- Presence of excrement (whitewash) near entrance to burrow.
- Burrowing owls frequently decorate entrance of burrows with cow or horse manure, feathers, vegetation and trash items.

How to avoid them:

- Scan ahead prior to arriving at a sign location.
- If burrowing owls are observed within the project area, stop and move at least 100 feet beyond the owl or occupied burrow before resuming work.

If you think your work may potentially impact a Burrowing Owl or active burrow, please stop. Move at least 100 feet from the animal or burrow before resuming work.

Appendix D

Wild At Heart Letter

**Wild At Heart
Burrowing Owl Project
31840 North 45th Street
Cave Creek, AZ 85331**

Office: 480-595-5047

E-mail: bob@wildatheartowls.org
greg@BTLLCAZ.com



March 28, 2023

Attention: Ilja Nieuwenhuizen
Environmental Manager
Longroad Energy
VIA EMAIL: ilja.nieuwenhuizen@longroadenergy.com

Reference: Burrowing Owl Relocation Area on 300-acre BLM Parcel Near Gila Bend, Arizona

Dear Ilja,

The purpose of this letter is to confirm the location and boundaries of a Burrowing Owl (*Athene cunicularia*) relocation area managed by Wild At Heart on Bureau of Land Management (BLM) land near Gila Bend, Arizona. The Burrowing Owl relocation area and the BLM parcel are about 7.5 miles northeast of Gila Bend and 0.75-mile west of State Route 85, as depicted in Attachment 1.

Wild At Heart has assessed the entire 300-acre BLM parcel for suitability as a Burrowing Owl relocation area and determined that much of the parcel is not suitable due to dense, tall vegetation (e.g., tamarisk) and the presence of an up to 100-foot-wide and 10-foot-deep irrigation basin along the western boundary. Wild At Heart has installed artificial burrow owl habitat in parts of an approximately 58-acre area (approximately 825 feet by 3,000 feet) in the southwestern portion of the BLM parcel, where the vegetation is more suitable for burrowing owl relocation. Wild At Heart has relocated 40 Burrowing Owls to this area and the owls are using the artificial burrows. This area includes a 150-foot buffer from artificial burrows, on the north and east sides of the relocation site. Wild at heart does not plan to use other portions of the BLM parcel.

Should you have any questions or want further information, please feel free to contact me.

Best Regards,




Greg Clark
Burrowing Owl Habitat Coordinator
Wild At Heart

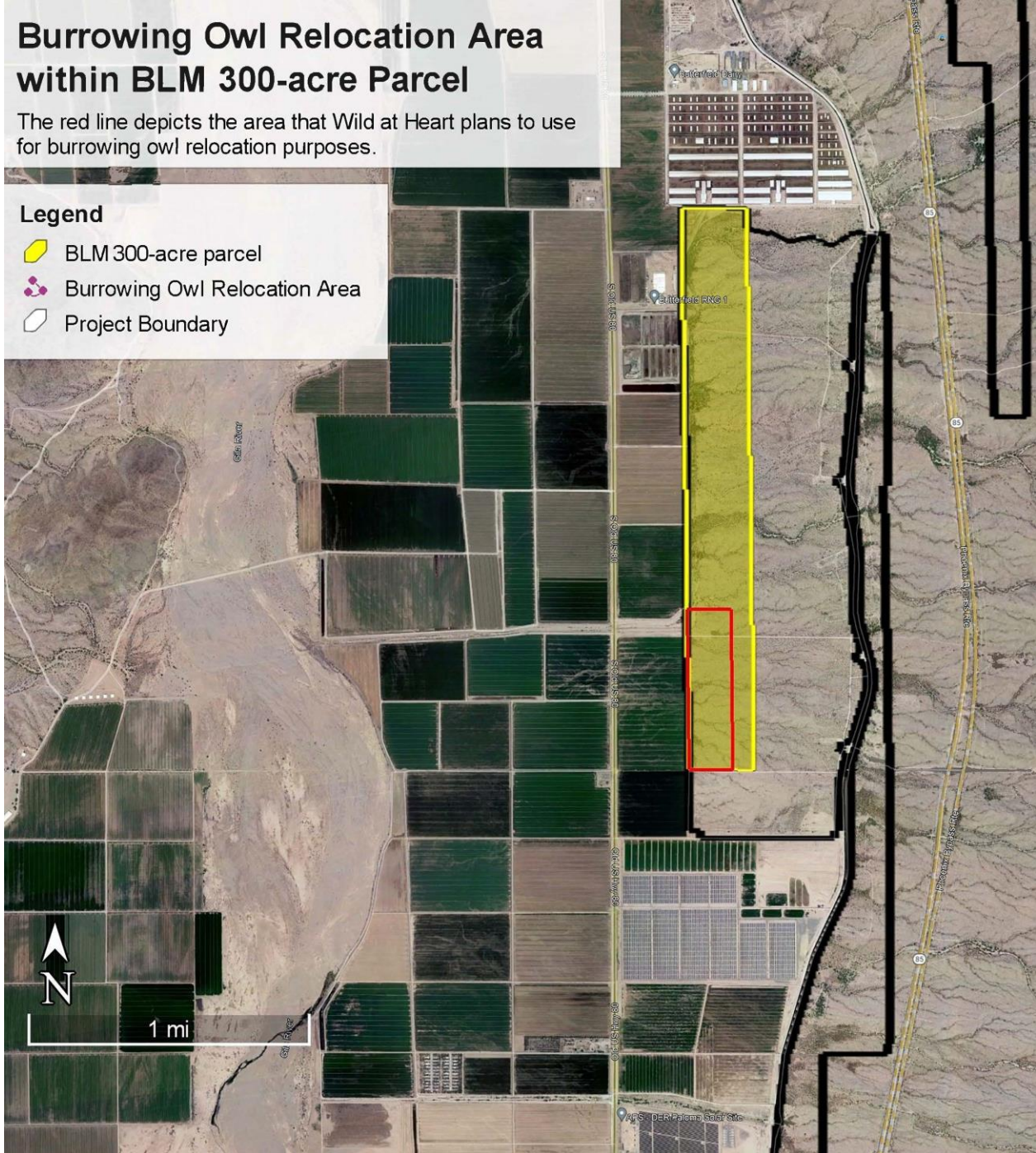
Attachment 1

Burrowing Owl Relocation Area within BLM 300-acre Parcel

The red line depicts the area that Wild at Heart plans to use for burrowing owl relocation purposes.

Legend

-  BLM 300-acre parcel
-  Burrowing Owl Relocation Area
-  Project Boundary



Appendix E

Cultural Class I Report

January 20, 2023

Anna Lundin
Kimley Horn
7740 North 16th Street, Suite 300
Phoenix, Arizona 85020

RE: Class I Literature Review for the Proposed Southwest Crossroads Project in Gila Bend, Maricopa County, Arizona

Dear Ms Lundin,

Kimley Horn contracted PaleoWest, LLC (PaleoWest) to conduct a site file search and literature review of 2,786.6 acres of State, Bureau of Land Management (BLM), and private land for the proposed Southwest Crossroads Project in Gila Bend, Maricopa County, Arizona (Undertaking; Table 1). Located along the northern edge of the Town of Gila Bend, the Area of Potential Effects (APE) extends approximately 10 miles (mi) north along Arizona Highway 85 and consists of two discontinuous irregular parcels for proposed solar fields and a gen-tie route. The northern parcel is approximately 3.5-mi × 1-mi at its maximum extents and is bisected by Arizona Highway 85, which extends north-south. The Gila Bend Canal trends north to south and cuts through the southern parcel, which is 5-mi × 0.7-mi at its maximum extents. The proposed gen-tie route includes a 600-foot corridor and will originate at a substation in the center of the southern parcel and extend southwest—paralleling Arizona Highway 85—until turning west and terminating at the Gila River Power Station.

As the Undertaking is located on State and Federal land, it is subject to regulations implementing Section 106 of the National Historic Preservation Act (NHPA) (36 CFR 800 [as revised in 2004]), the Arizona Antiquities Act (AAA; ARS § 41-841 et seq.), and the Arizona State Historic Preservation Act (ARS § 41-861 through § 41-864)].

The APE is bound by Old US Highway 80 and agricultural fields to the west and the town of Gila Bend to the south. Arizona Highway 85 is located to the east of the APE and crosses through the northern portion. Portions of the APE cross through Sections 2, 3, 10, 11, 14, 22, 23, 26, 27, and 34 of Township (T) 4 South (S) and Range (R) 4 West (W) and Sections 3, 9, 10, 15, 16, 20, and 21 of T5S and R4W, Gila and Salt River Base Line and Meridian (1976 U.S. Geological Survey [USGS] 7.5-minute Cotton Center, Arizona; 1976 USGS 7.5-minute Gila Bend, Arizona). The APE centroid is at 1983 North American Datum (NAD 83), Universal Transverse Mercator (UTM) Zone 12, 345850 mE, 3658710 mN.

DESCRIPTION OF UNDERTAKING

Kimley-Horn is proposing to develop a solar generation area which will include solar fields and a connecting gen-tie rout, referred to as the Southwest Crossroads project. Ground disturbing activities may include geotechnical investigations, vegetation removal, raking, grading, and excavation.

SETTING

The APE is in an alluvial basin between the Maricopa Mountains 6-mi to the east, the Gila Bend Mountains 4-mi to the west, and the Gila River 1-mi to the west. Elevation within the APE ranges from 700 to 830 feet (ft) above mean sea level (amsl). Native vegetation within the APE belongs to the Lower Colorado River subdivision of the Sonoran Desertscrub biotic community. Expected native vegetation on undeveloped land includes: White Bursage (*Ambrosia Dumosa*), Creosotebush (*Larrea tridentata*), Big Galleta (*Hilaria rigida*), Indigo Bush (*Psoralea schottii*), and Longleaf Ephedra (*Ephedra trifurca*) (Brown 1994). Surficial geology consists of Quaternary (0 – 2Ma) alluvial and eolian deposits—mostly sand. Soils within the APE can be found in Table 2.

Table 1. Soils within the APE

Soil Type	Parent Material	Landform(s)
Carrizo-Momoli complex (0–3% slopes)	Recent mixed alluvium	Fan terraces, alluvial fans
Denure gravelly fine sandy loam (0–3% slopes)	Mixed alluvium	Fan terraces
Denure-Rillito-Why complex (1–5% slopes)	Mixed alluvium	Fan terraces
Gunsight-Chuckawalla complex (1–15% slopes)	Mixed alluvium	Fan terraces
Gunsight-Rillito-Carrizo complex (1–15% slopes)	Mixed alluvium	Fan terraces
Why-Carrizo complex (0–3% slopes)	Mixed stratified alluvium	Alluvial fans

* U.S. Department of Agriculture, Natural Resources Conservation Service (USDA NRCS) 2018.

Most of the APE is undeveloped land; however, there are some unimproved roads trending east to west through the northern part of the APE and unimproved roads trending north to south through the southern area. The Gila Bend Canal crosses through the APE trending north to south. Both the Old US Highway 80 and Arizona Highway 85 intersect the southern and northern ends of the APE, respectively. A dairy farm, agricultural fields, two solar power plants, and the Gila River Power Station are located on the western margin of the APE.

PREVIOUS RESEARCH

PaleoWest examined records in the online AZSITE database, the Arizona State Museum (ASM) Archaeological Records Office (ARO), and BLM’s Lower Sonoran Field Office to determine the location of any previously conducted archaeological surveys or previously recorded archaeological sites within a 1-mi radius of the APE. General Land Office (GLO) maps and historical USGS topographic maps were also consulted to evaluate the possible presence of historical infrastructure in and near the APE. The National Register Information System database was also reviewed.

A total of 38 previous projects are located within the search radius, of which 16 projects extended into the APE (1981-81.ASM, 1989-22.ASM, 1994-157.ASM, 1994-330.ASM, 1999-462.ASM, 2000-385.ASM, 2000-567.ASM, 2004-1784.ASM, 2009-202.ASM, 2009-843.ASM, 2011-52.ASM, 2012-36.ASM, TR18.BLM, BLM-200-11-26, BLM 020-11-04-161 and BLM-020-11-04-159). Due to improvements in survey methodology and the moving 50-year window for

eligibility for the NRHP, jurisdictions within Arizona vary in how long they consider an archaeological survey to remain valid. In keeping with the Arizona State Historic Preservation Office Guidance Point No. 5 (Arizona SHPO 2004) and the requirements of some jurisdictions within the state, PaleoWest considers surveys conducted in the past ten years to be accurate and up to date. Surveys older than this have been evaluated on a case-by-case basis. The APE has not been surveyed in the past ten years. Approximately 458.1 acres of the APE was surveyed by older projects, of which 1.4 were surveyed within the past 14 years (after 2009) and to current SHPO standards. The remaining 456.7 acres were surveyed before 2009, which is considered out of date, or were not surveyed to current SHPO standards. These previous surveys were conducted in support of water line construction, transmission line construction, and road maintenance specifically for US highway 85.

A total of 57 sites are located within the search radius, of which 9 sites extend into the APE. A general breakdown of these sites is shown in Table 3. Sites AZ T:14:68(ASM), AZ T:14:83(ASM), AZ T:14:84(ASM), AZ T:14:85(ASM), AZ T:14:86(ASM), AZ T:14:87(ASM), AZ T:14:88(ASM) are all trail segments and artifact scatters of unknown origin that cross the APE. These sites were determined eligible individually for inclusion in the NRHP with the exception of site AZ T:14:68(ASM) which was determined not eligible individually for inclusion in the NRHP (SHPO-2002-1161). The last two sites that cross the APE are AZ T:14:179(ASM) and AZ T:14:61(ASM), both of which are historic Euro-American sites. Site AZ T:14:179(ASM) is a historic refuse scatter that was recommended eligible for inclusion to the NRHP while site AZ T:14:61(ASM), also known as the Butterfield Overland Stage Route, was determined eligible individually for inclusion to the NRHP (SHPO-2020-1225).

Table 2. Previously Recorded Sites within the Search Radius

Site Type	Number in Search Radius	Number within APE
Prehistoric Trail(s)	36	7
Historic Trail	1	1
Artifact Scatter(s)	7	–
Historic Refuse Scatter(s)	3	1
Artifact Scatter with Prehistoric and Historic Components	1	–
Rock Pile Site	3	–
Historic Structure(s)	3	–
Modern Rock Alignments	1	–
Unknown	2	–

Three historic-in-use structures were identified within the search radius: the Gila Bend Canal (AZ Z:2:66(ASM)), Old US Highway 80 (AZ FF:9:17(ASM)), and the APS Gillespie to Gila Bend 69-kV Line (AZ Z:2:92(ASM)). The Gila Bend Canal is a historic-in-use canal which trends north to south through the whole length of the APE (Figures 10–13). This segment of the Gila Bend Canal has been determined eligible individually for inclusion to the NRHP (SHPO-2011-0581). This historic-in-use canal is first seen in historic aerial photos from 1947 and first appears on both 1951 USGS maps (Netronline 2023). Old US Highway 80 is a historic-in-use road which

crosses the southern portion of the APE and then runs adjacent to the northern portions of the APE. This segment of the Old US Highway 80 was also determined eligible individually for inclusion to the NRHP (SHPO-2007-2020). It is first seen in historic aerial photos in 1947 and first appears on both 1951 USGS maps (Netronline 2023). Lastly, the APS Gillespie to Gila Bend 69-kV Line is a historic-in-use transmission line which has been recommended eligible by the recorders (Netronline 2023). This transmission line follows the route of Old US Highway 80 and was completed in 1958 (Watkins et. al. 2011). Historic GLO and USGS maps were consulted. Consulted GLO plats are 3771 (filed 6-23-1871), 3769 (filed 8-10-1933), 3799 (filed 4-1-1872), 3797 (filed 1-12-1948), and 3798 (filed 12-15-1892). Consulted USGS maps are: USGS 1:62500 Cotton Center, Ariz (1951), USGS 1:250000 Phoenix, Arizona (1954, 1957, 1958, 1960, 1969, and 1971), USGS 1:62500 Gila Bend, Ariz (1951), and USGS 1:250000 Ajo, Ariz (1953, 1957, 1958, 1962, 1963, and 1967).

A total of 4 GLO map features and 15 USGS map features were identified within the search radius. These features consist of 4 indeterminate roads, 1 windmill, 1 well, 5 unimproved roads, 2 cattle tanks, 2 light duty roads, 2 railroads, 1 historic-in-use canal (The Gila Bend Canal), and 1 historic-in-use highway (Old US Highway 80). Nine of these resources intersect the APE, including the four indeterminate roads (Figures 8–9, 12–13), the Gila Bend Canal (Figures 10–13), the Old US Highway 80 (Figures 10–13), one of the light duty roads (Figures 8 and 12), and the two railroads (Figures 8–9, 12–13). The four indeterminate roads (Figures 8–9, 12–13) were identified from GLO plat 3799 but are not depicted on subsequent USGS maps. The light use road was first seen on the 1971 USGS map and is not seen in historical aerial imagery. The two railroads are first seen on the 1953 USGS map and are not seen in historic aerial photos (Netronline 2023).

Both the Gila Bend Canal and Old US Highway 80 have been seen in the 1947 historic aerial photos and 1951 historic USGS maps, as previously mentioned. After consultation with BLM, there are two unrecorded prehistoric trails to the east of Old US Highway 80 in T4S R4W Section 27. These trails have been marked for avoidance by BLM for the purpose of owl habitat construction.

RECOMMENDATIONS

Kimley Horn contracted PaleoWest to conduct a site file search and literature review of 2,786 acres of State, Bureau of Land Management (BLM), and private land for the proposed Southwest Crossroads Project in Gila Bend, Maricopa County, Arizona. Approximately 16.4 percent (458.1 acres) of the APE has been previously surveyed for cultural resources. Of the portions of the APE that was previously surveyed, only 0.3 percent (1.4 acres) was surveyed by projects meeting modern SHPO standards. A total of 0.05 percent of the APE has therefore been previously surveyed by projects meeting modern SHPO standards.

Previously identified cultural resources and historical map features within the APE consist of 7 trail sites of unknown origin, 1 historic refuse scatter, the Butterfield Overland Stage Route, 1 historic-in-use canal (Gila Bend Canal), 1 historic-in-use road (Old US highway 80), 1 historic-in-use transmission line (APS Gillespie to Gila Bend 69-kV Line), 4 indeterminate roads, 1 light duty road, and 2 railroads. Of these resources found within the APE, six of the seven trail sites, the Butterfield Overland Stage Route, the Gila Bend Canal and Old US Highway 80, within the APE were determined eligible individually for inclusion in the NHRP. The historic refuse scatter

(site AZ T:14:179(ASM)) and the APS Gillespie to Gila Bend 69-kV Line were both recommended eligible for the NRHP. Other sites within the search radius but outside of the APE itself consist of 31 trail segments and artifact scatters of unknown origin, 10 prehistoric trail segments and artifact scatters contributed to the Hohokam and Patayan traditions, 6 Euro-American historic artifact scatters and/or structures, 1 artifact scatter with both prehistoric and historic components, and 1 modern rock alignment.

PaleoWest recommends the Undertaking proceed with a finding of adverse effects to historic properties. To mitigate adverse effects to historic properties, PaleoWest recommends a Class III survey of portions of the APE that were previously not surveyed, re-survey areas surveyed prior to 2009, and re-visit and re-record sites within post-2009 surveyed areas. Since only 0.05 percent of the APE was previously surveyed to SHPO standards, it is most likely that additional unknown sites can be identified. Additionally, human remains and mortuary features are likely present within known NRHP eligible sites. These sites will require avoidance or testing and data recovery prior to ground disturbing activity.

Sincerely,
PALEOWEST

A handwritten signature in blue ink that reads "Marion Forest". The signature is written in a cursive, flowing style with a long horizontal stroke extending to the right.

Marion Forest, Ph.D., RPA | Senior Archaeologist

RESULTS OF PREVIOUS RESEARCH

Previous Projects within the APE

Project Reference	Project Name	Associated Reference
1981-81.ASM	State Land Survey	Laye 1981
1989-22.ASM	Hassayampa - Gila Bend Tel. Cable	Macnider 1989
1994-157.ASM	Epng Pacificorp Turbine Pipeline Project	Rogge 1994
1994-330.ASM	Sr 85 Between Gila Bend And Buckeye	Harmon et. al. 1995
1999-462.ASM	Cultural Resource Survey For The Proposed Panda Gila River Project	Rogge et. al. 2000
2000-385.ASM	Panda Gila River Pipeline	Bauer and Rogge 2000
2000-567.ASM	Falk-SR 85	Boloyan 2001
2004-1784.ASM	Gila Bend-Fann	Goldstein 2005
2009-202.ASM	Aps On-Call Cultural Resources Surveys	Watkins et al. 2011
2009-843.ASM	Gila Bend To Cotton Center 69kv Rebuild Inventory	Poseyesva 2009
2011-52.ASM	Solon Solar Array Archaeological Survey	Barr 2010
2012-36.ASM	Rushprojects Number 2 (Gila Bend Survey)	Punzmann 2012
TR18.BLM	Unknown	BLM personal communication 2022
BLM-200-11-26	Cotton Center Palomas	Simonis 1981
BLM 020-11-04-161	Additional Work under Contract No. 02-59, Archaeological Investigations, Gila Bend Buckeye TRACS No. H 3225 02L, Project No. F-023-1-420.	Czarzasty 2004
BLM-020-11-04-159	Additional Work under Contract No. 02-59, Archaeological Investigations, Gila Bend to Buckeye TRACS No. H3225 02L, Project No. F-023-1-420	Czarzasty 2003

Previously Recorded Cultural Resources Within the APE

Site No./ Name	Affiliation	Site Type	Eligibility Status	Associated Reference(s)
AZ FF:9:17(ASM)/ Old US Highway 80	Euro-American late historic to present (A.D.1900-present)	Historic in use road	Determined Eligible Individually, Criterion A (SHPO-2007-2020)	Watkins et. al. 2011 (Figures 10-13)
AZ T:14:68(ASM)	Unknown	Trail segments, rock feature, lithic scatter	Determined Ineligible Individually (SHPO-2002-1161)	Harmon et al. 1995; Punzmann 2012 (Figure 10)

Site No./ Name	Affiliation	Site Type	Eligibility Status	Associated Reference(s)
AZ T:14:83(ASM)	Unknown	Trail segments, rock features, petroglyph, lithic artifacts	Determined Eligible Individually, Criterion D (SHPO-2002-1161)	Harmon et. al. 1995 (Figure 10)
AZ T:14:84(ASM)	Unknown	Trail segments and possible rock features	Determined Eligible Individually, Criterion D	Harmon et. al. 1995 (Figure 10)
AZ T:14:85(ASM)	Unknown	Trail segments, rock ring, rock cluster	Determined Eligible Individually, Criterion D	Harmon et. al. 1995 (Figure 10)
AZ T:14:86(ASM)	Unknown	Trail segment, petroglyph, two rock features	Determined Eligible Individually, Criterion D (SHPO-2002-1161)	Harmon et. al. 1995 (Figure 10)
AZ T:14:87(ASM)	Unknown	Two trail segments, 5 rock features	Determined Eligible Individually, Criterion D	Harmon et. al. 1995 (Figure 10)
AZ T:14:88(ASM)	Unknown	Trail, rock features, petroglyphs	Determined Eligible Individually, Criterion D	Harmon et. al. 1995 (Figure 10)
AZ T:14:61(ASM)/ Butterfield Overland Stage Route	Euro-American (Historic AD1500-1950)	Historic road	Determined Eligible Individually, Criterion A (SHPO-2020-1225)	Harmon et. al. 1995; Watkins et. al. 2011 (Figure 12)
AZ T:14:179(ASM)	Euro-American (1950-1961)	Historic trash dump	Recommended not eligible	Punzmann 2012 (Figure 8)
AZ Z:2:66(ASM)/ Gila Bend Canal	Euro-American (Historic in use, origin 1892 AD)	Historic In use Canal	Determined Eligible Individually, Criterion A (SHPO-2011-0581)	Watkins et. al. 2011 (Figures 10-13)
AZ Z:2:92(ASM)/ APS Gillespie to Gila Bend 69-kV Line	Historic Euro-American (A.D. 1958-present)	Historic-in-use transmission line	Recommended Eligible, Criterion A	Watkins et. al. 2011 (Figures 10-13)

Historic Buildings/Districts/Neighborhoods Within the APE

Property Name or Address	Year	Eligibility Status
N/A	N/A	N/A

Historic USGS Map and GLO Properties Within the APE

Property Description	Map Year	Figure
Indeterminate roads (4)	1872 (GLO plat 3799)	Figures 12 and 13
Historic-in-use canal (1)	1951 (USGS Cotton Center, AZ and Gila Bend, AZ)	Figures 10, 11, 12, and 13
Historic-in-use highway (1)	1951 (USGS Cotton Center, AZ and Gila Bend, AZ)	Figures 10, 11, 12, and 13
Light duty road (1)	1971 (USGS Phoenix, AZ)	Figures 12 and 13

Property Description	Map Year	Figure
Railroads (2)	1953 (USGS Ajo, AZ)	Figures 12 and 13

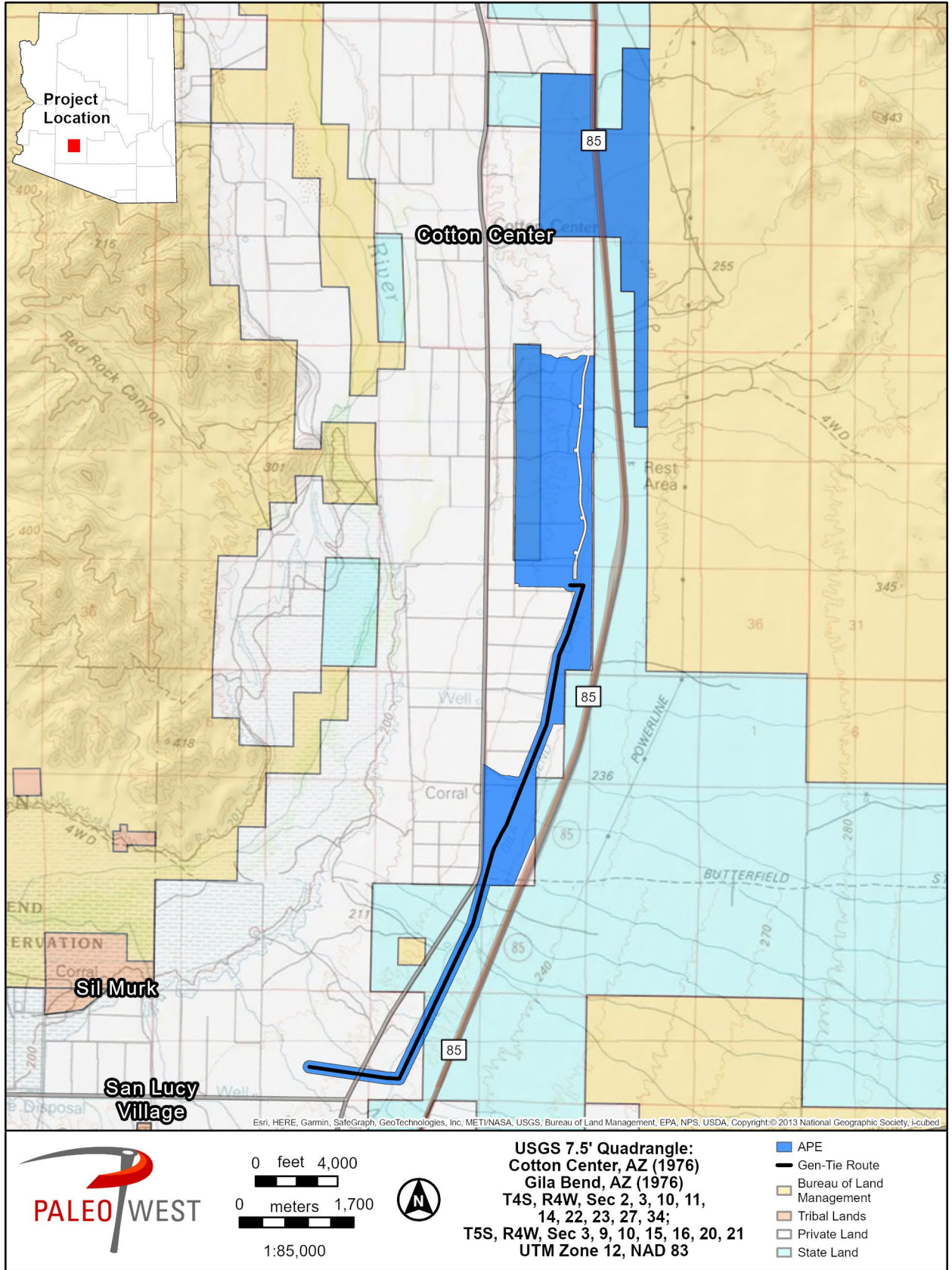


Figure 1. Project vicinity overview with land jurisdictions.

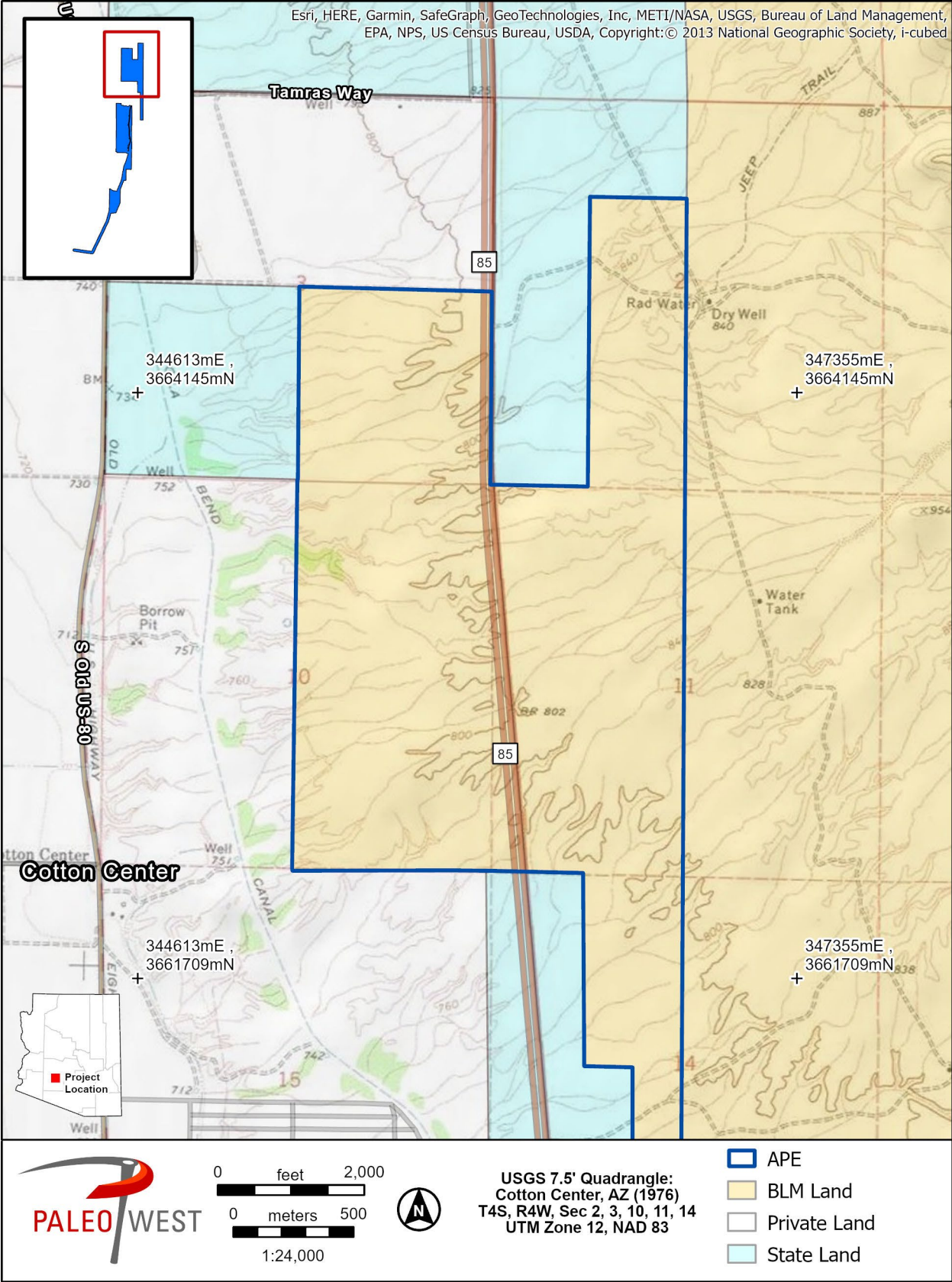


Figure 2. APE showing land jurisdiction (1 of 4).

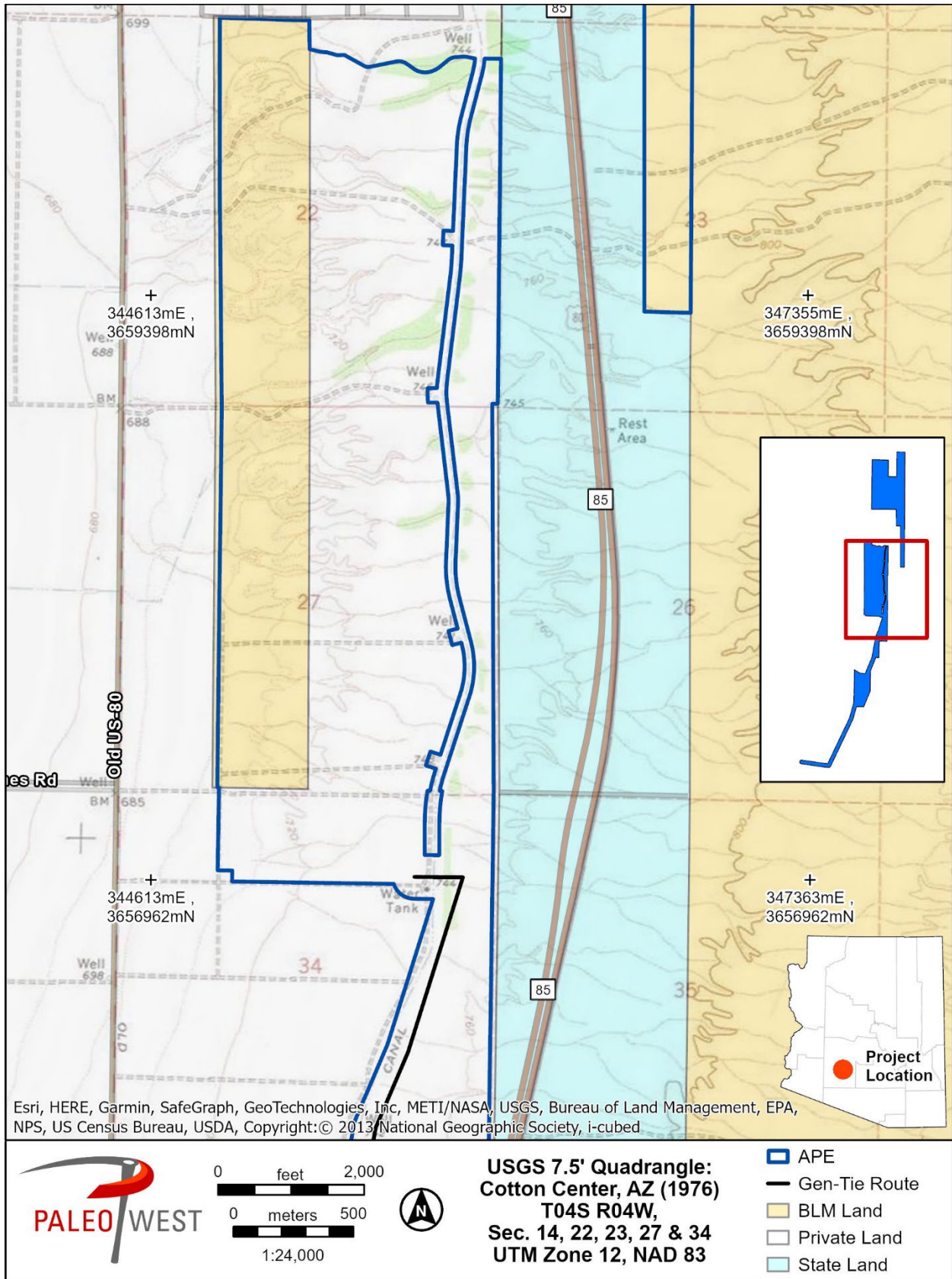


Figure 3. APE showing land jurisdiction (2 of 4).

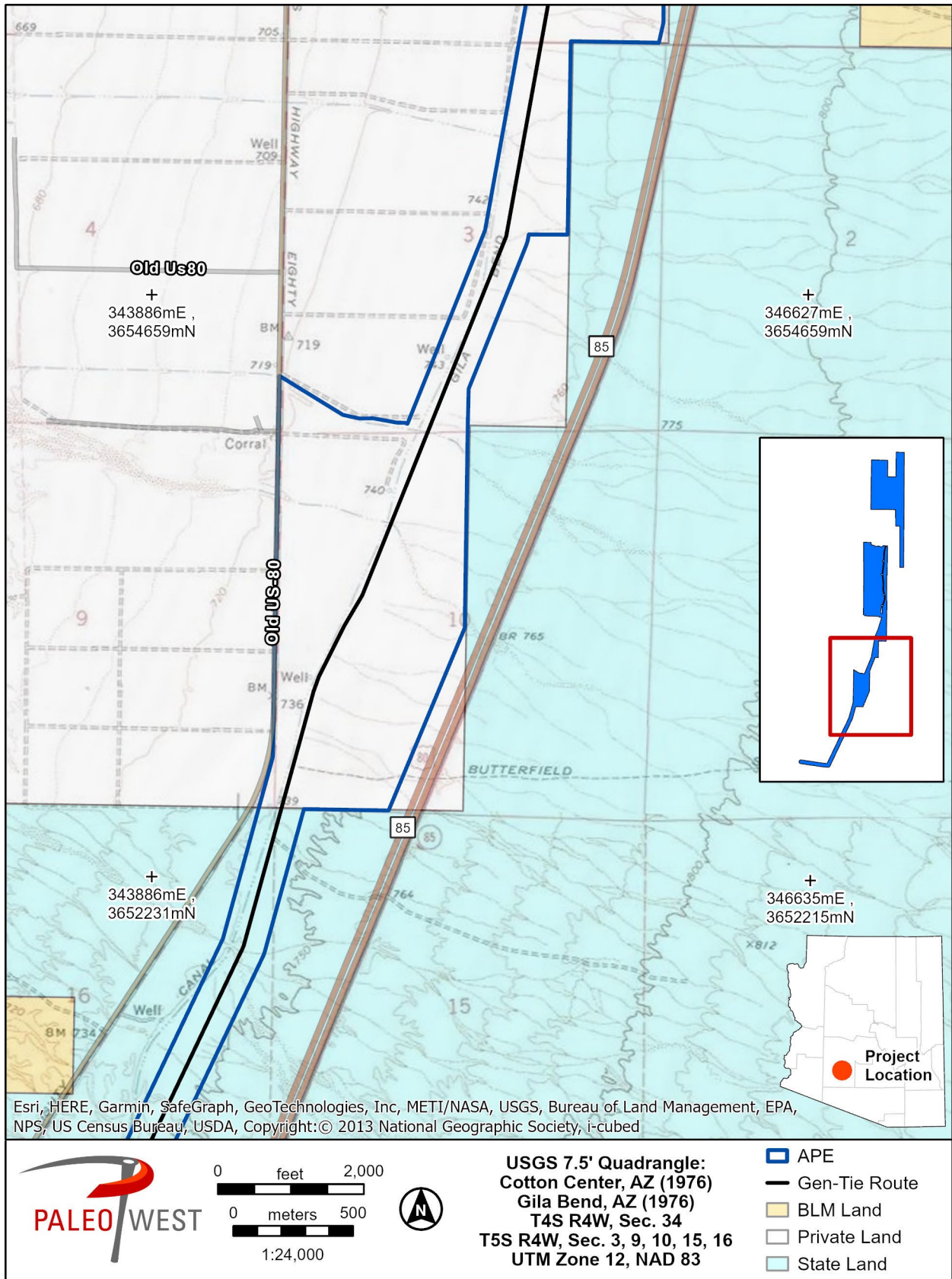


Figure 4. APE showing land jurisdiction (3 of 4).

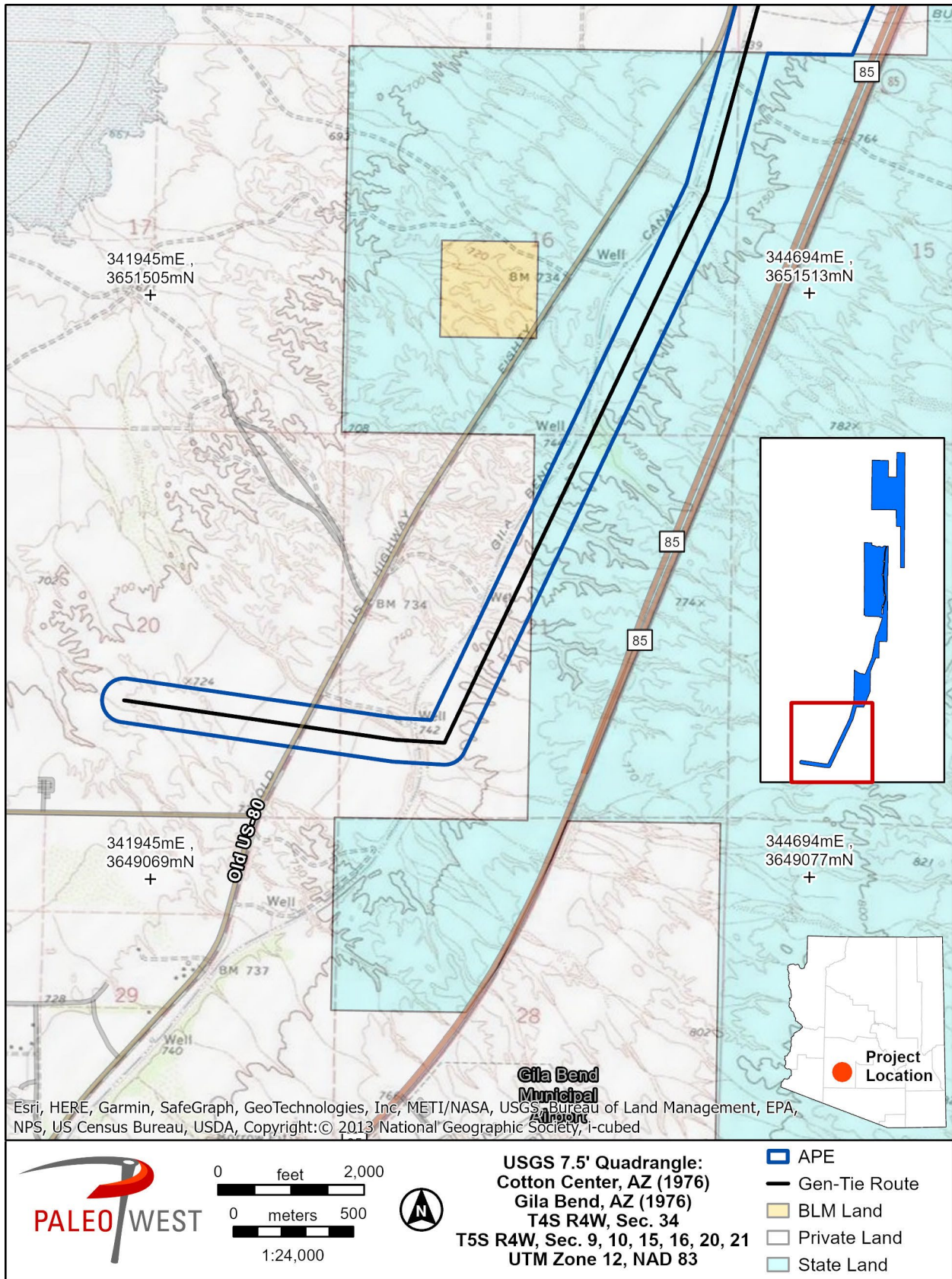


Figure 5. APE showing land jurisdiction (4 of 4).

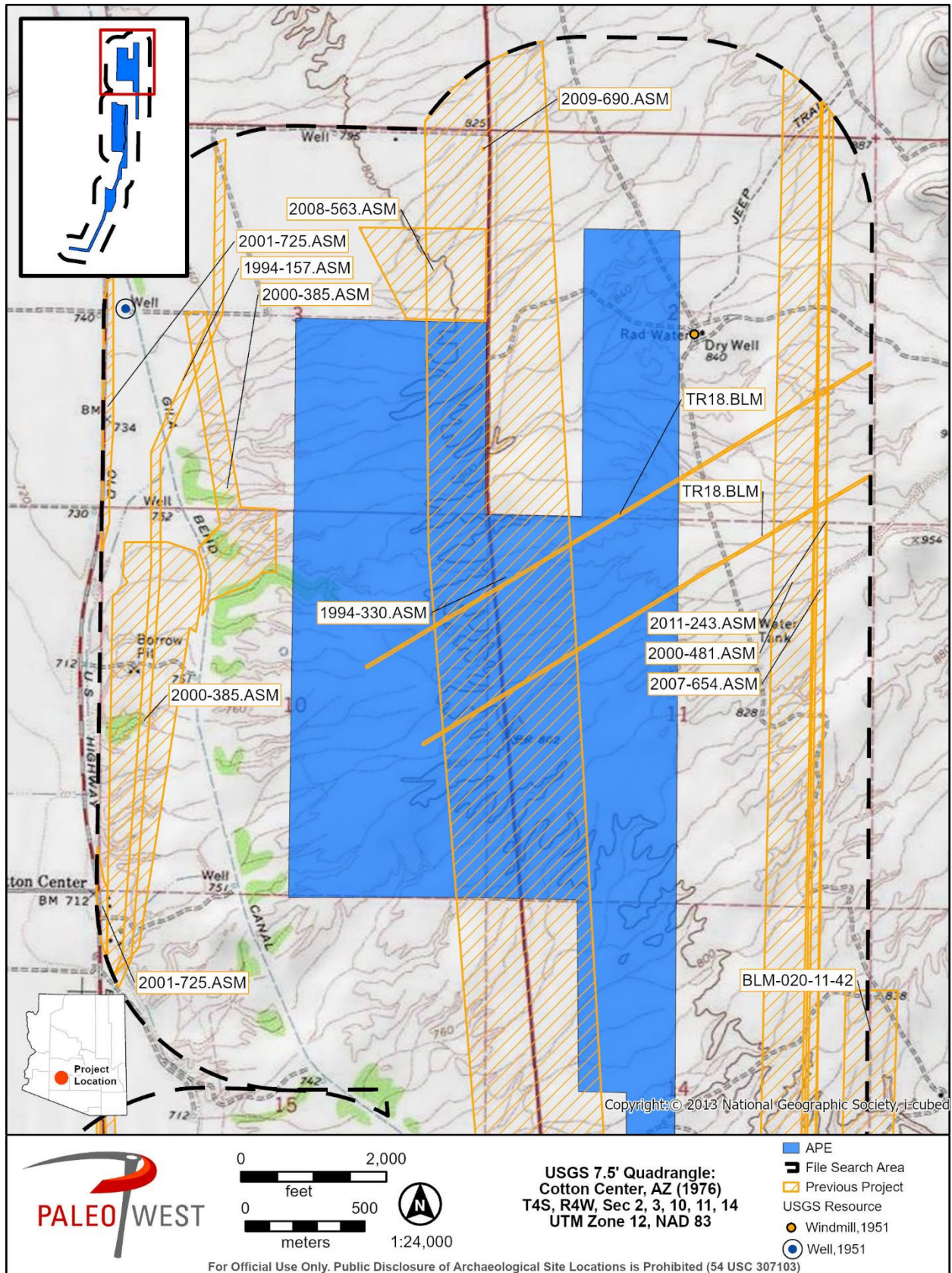


Figure 6. Previous projects within in the search area (1 of 4).

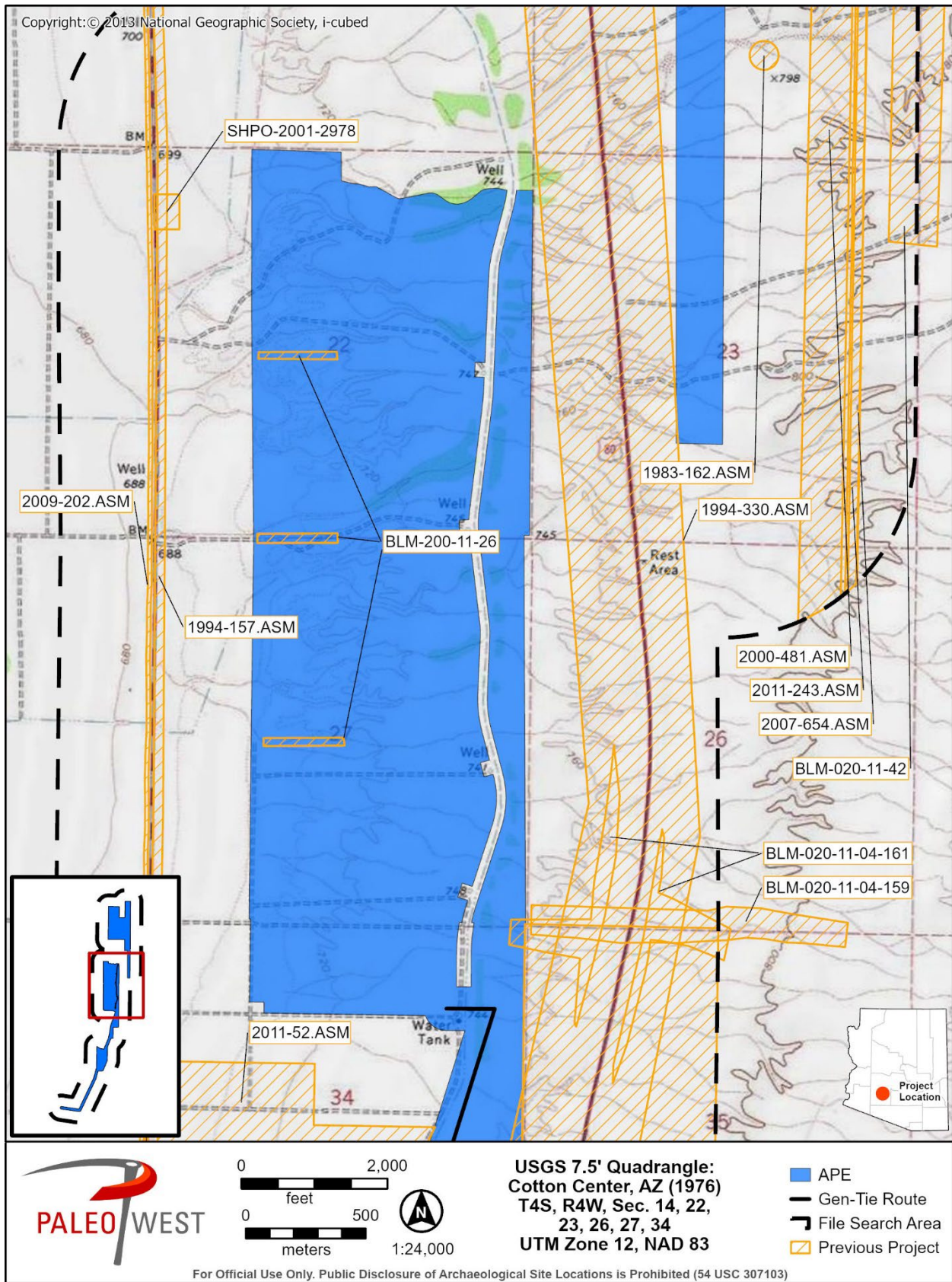


Figure 7. Previous projects within in the search area (2 of 4).

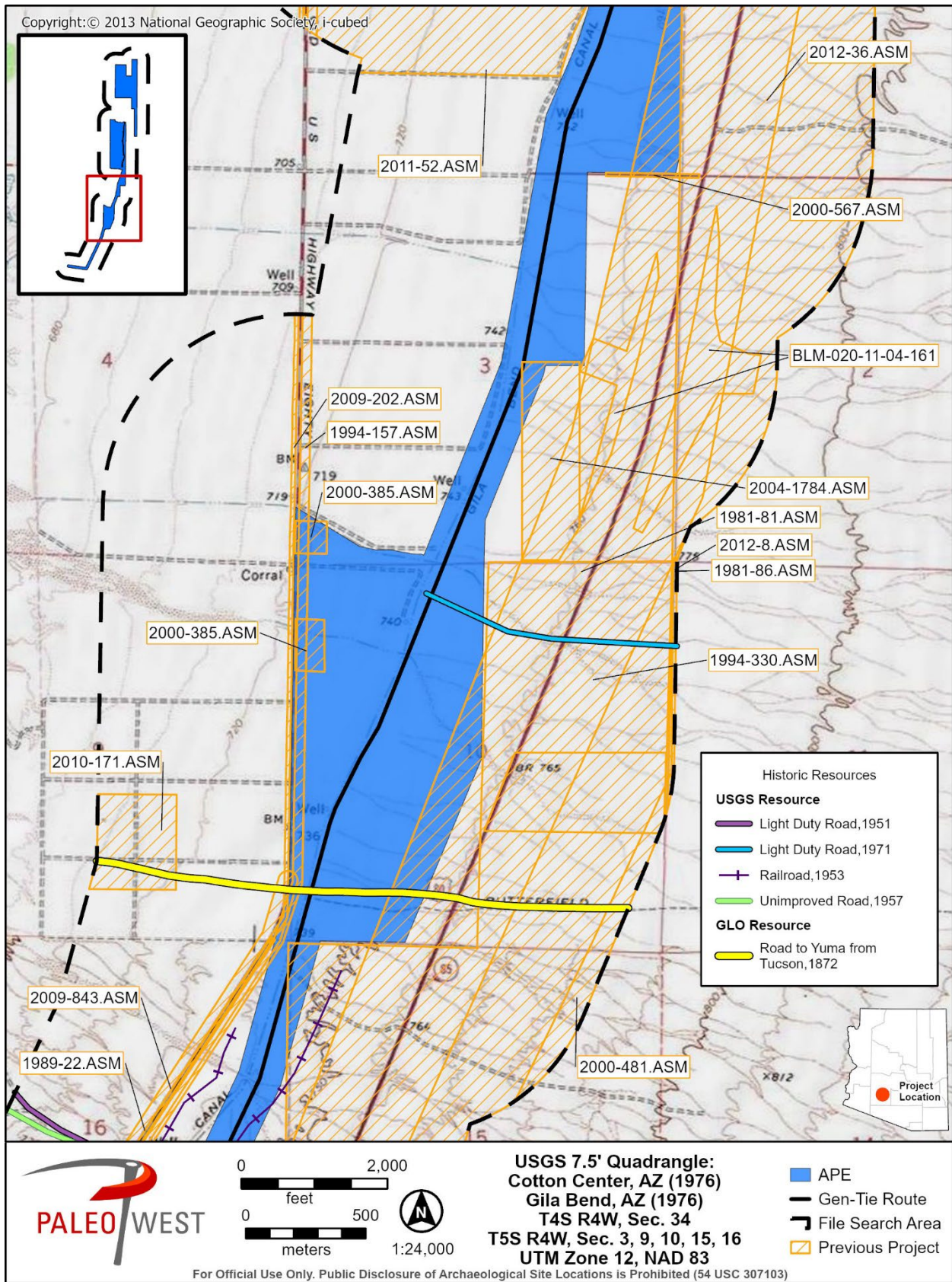


Figure 8. Previous projects within in the search area (3 of 4).

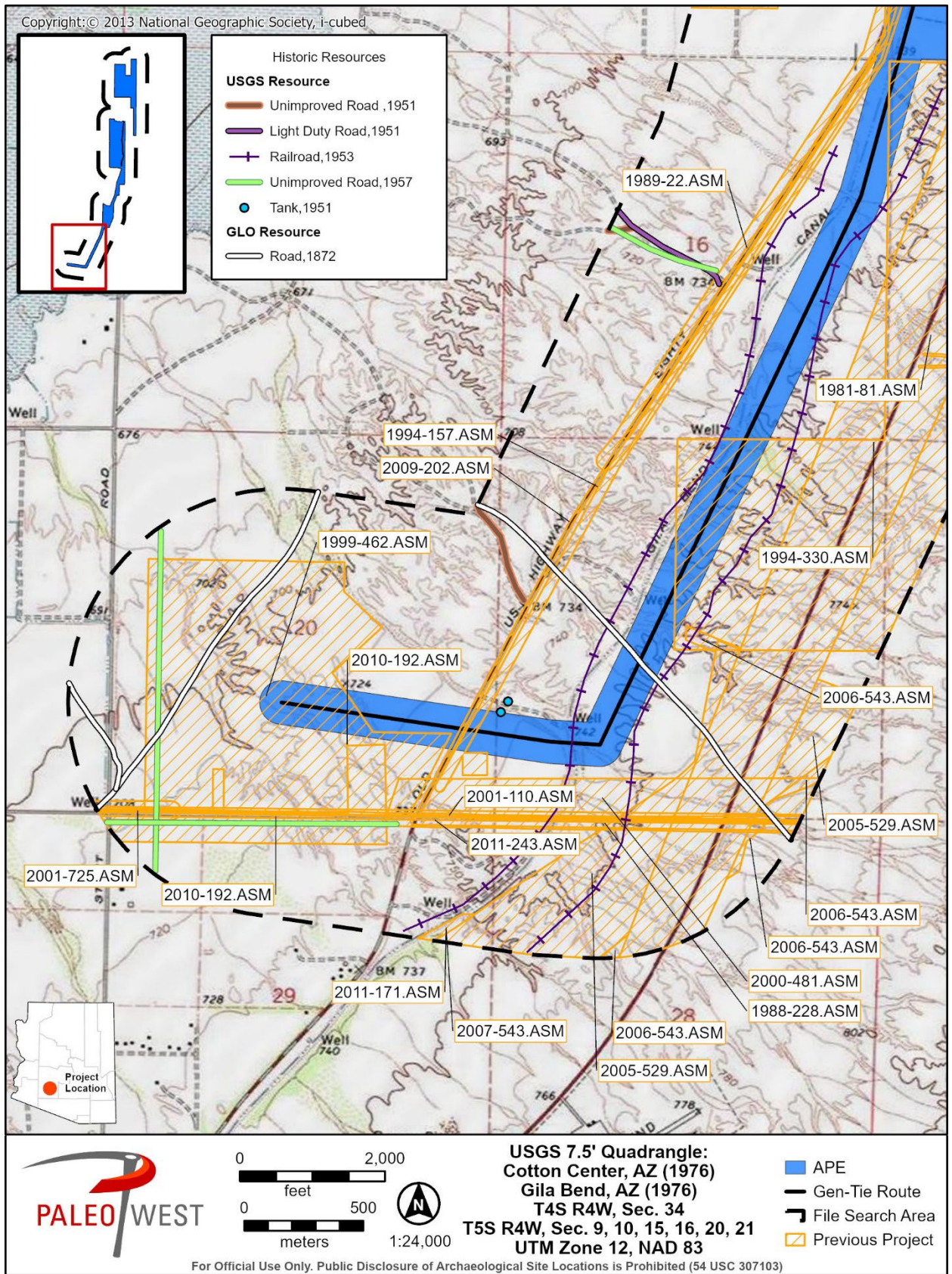


Figure 9. Previous projects within in the search area (4 of 4).

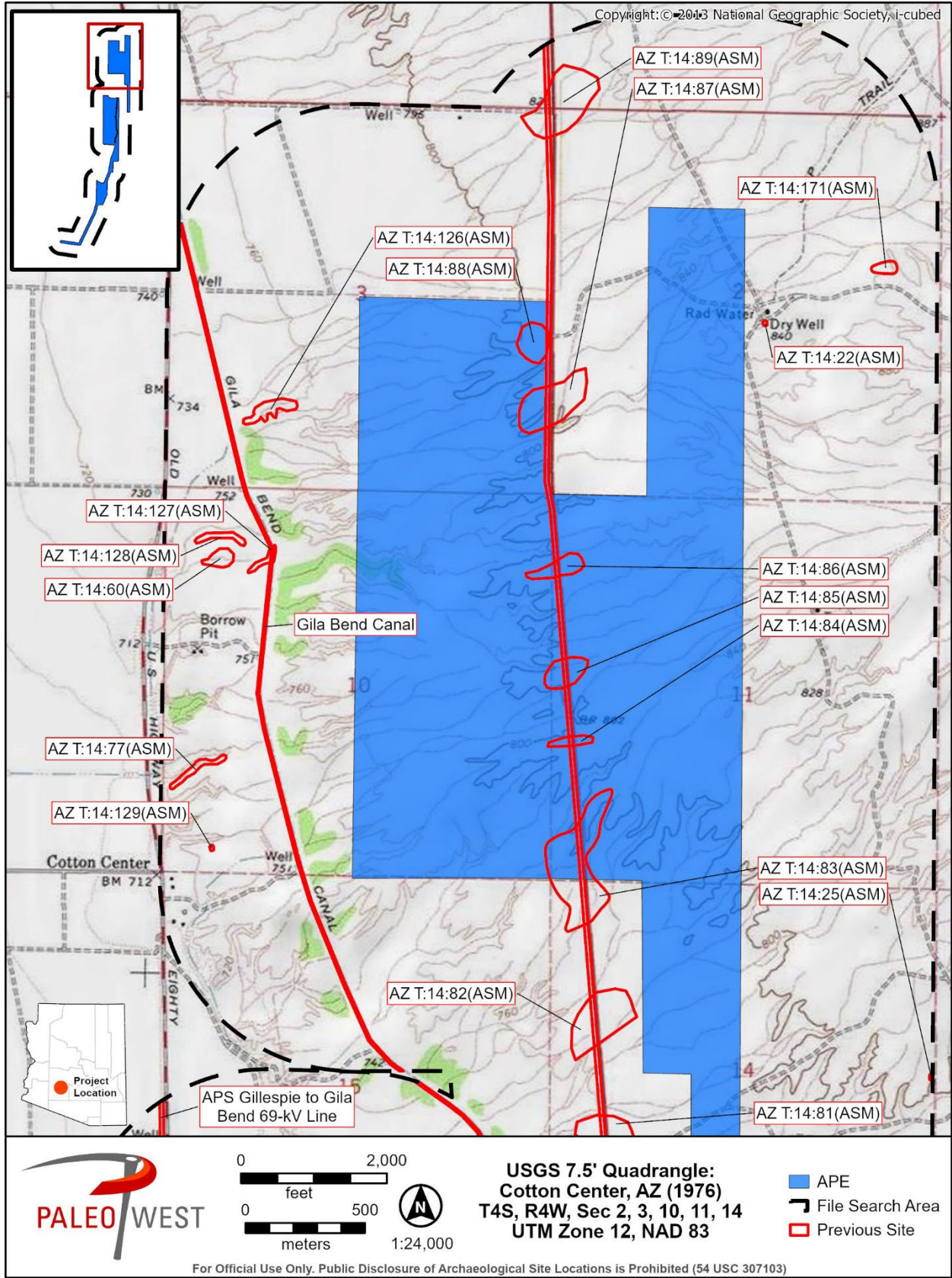


Figure 10. Previously recorded sites, GLO, and USGS resources within the search radius (1 of 4).

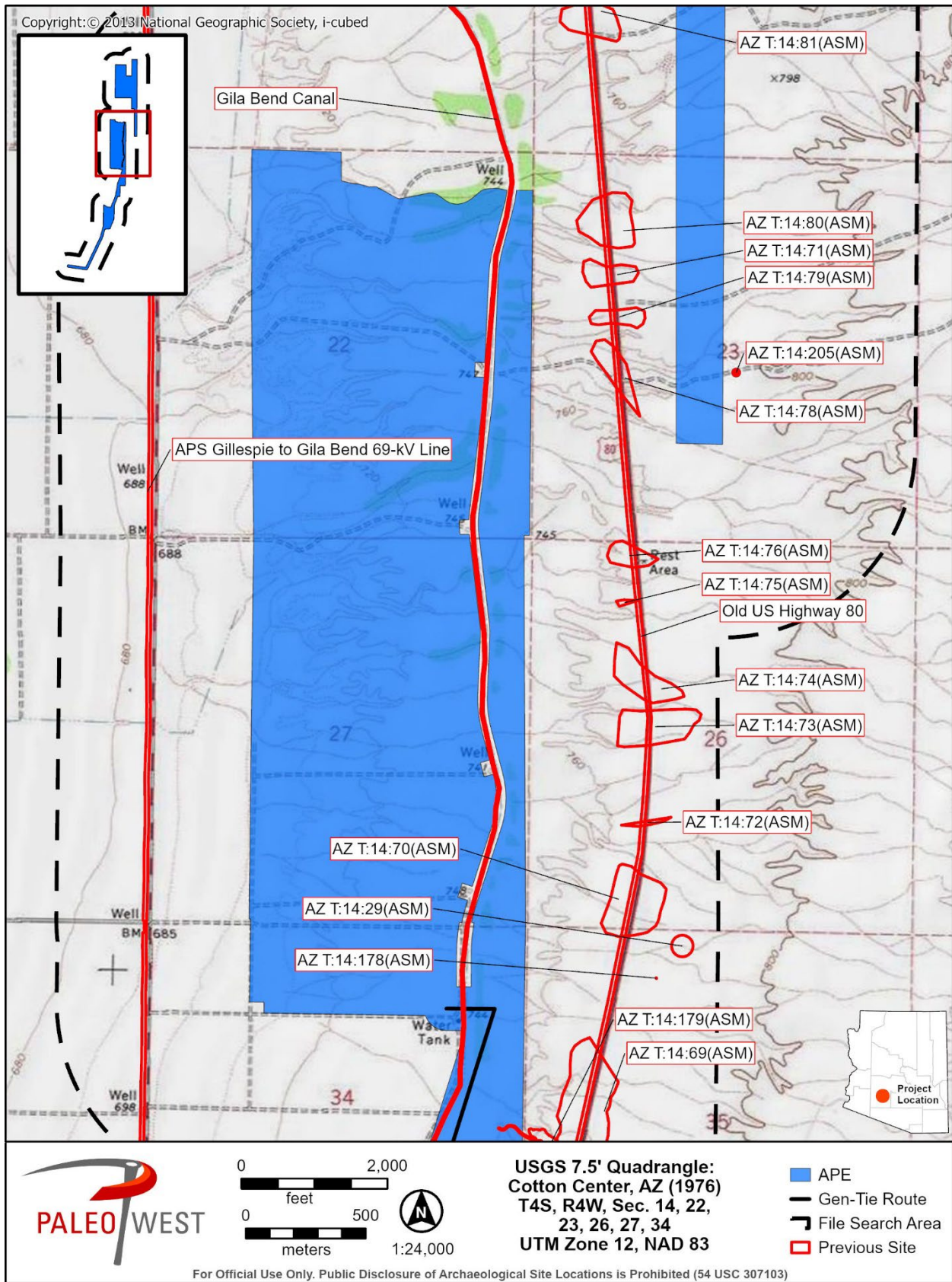


Figure 11. Previously recorded sites, GLO, and USGS resources within the search radius (2 of 4).

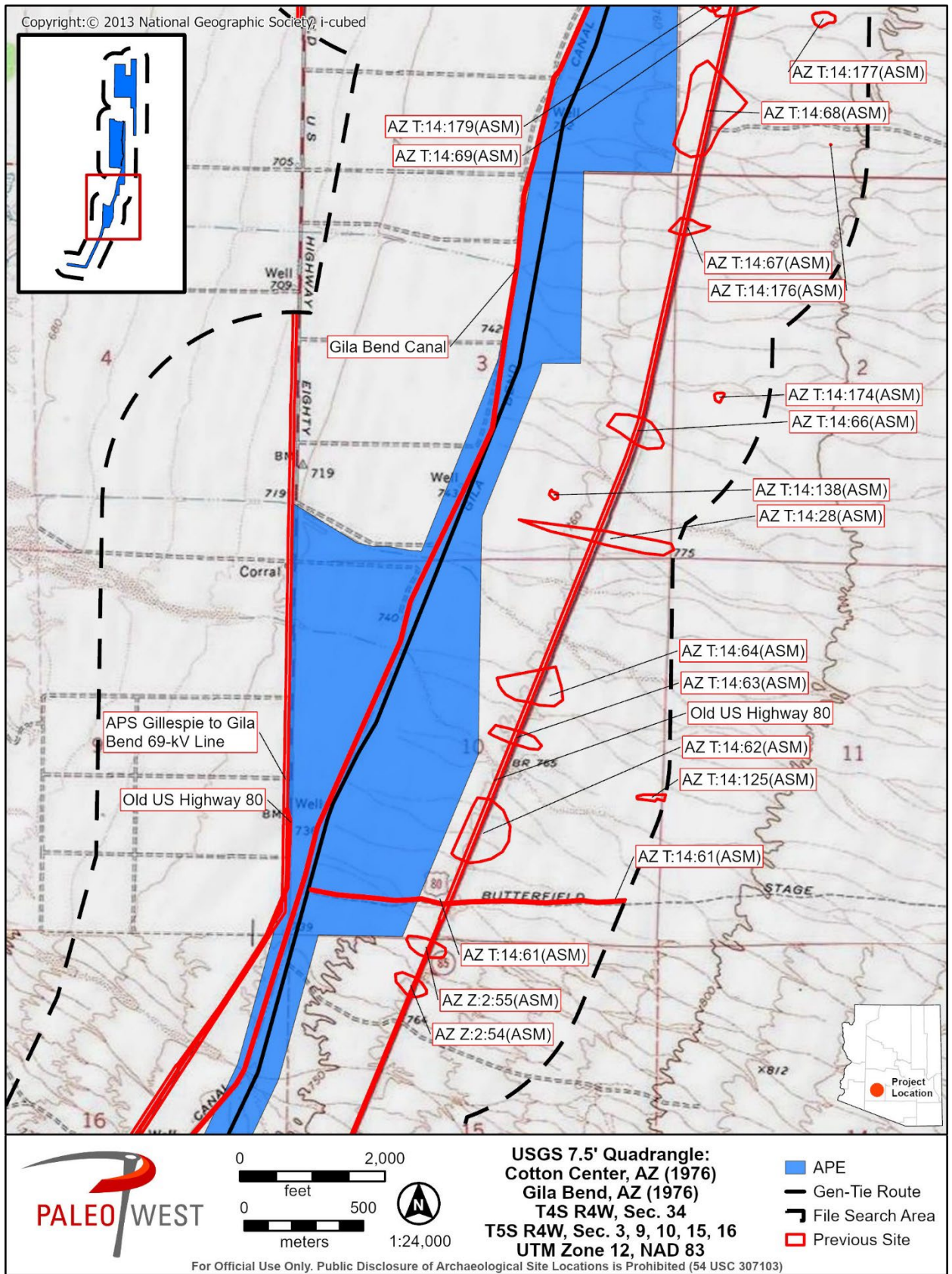


Figure 12. Previously recorded sites, GLO, and USGS resources within the search radius (3 of 4).

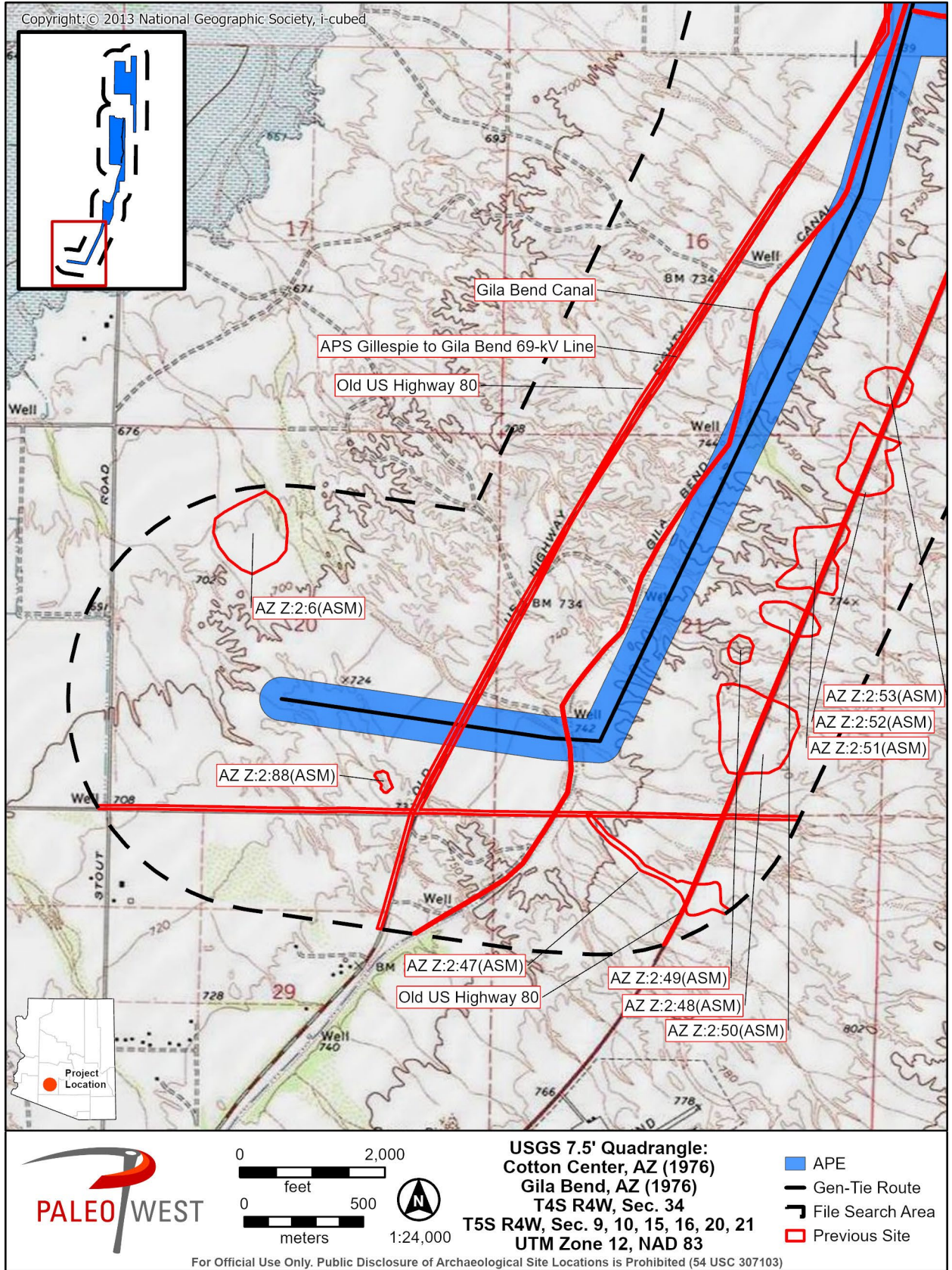


Figure 13. Previously recorded sites, GLO, and USGS resources within the search radius (4 of 4).

REFERENCES

Arizona State Historic Preservation Office

- 2004 SHPO Position on Relying on Old Archaeological Survey Data. SHPO Guidance Point No. 5. Arizona State Parks.

Bauer, Sharon K. and A.E. Rogge.

- 2000 *Cultural Resource Survey for the Panda Gila River Pipeline Project*. Dames & Moore Intermountain Cultural Resource Services Research Paper No. 63. URS Dames & Moore. Phoenix, Arizona.

Barr, David M. R.

- 2010 Archaeological Survey of Approximately 146 Acres for a Proposed 18-Megawatt Solar Plant in Gila Bend, Maricopa County, Arizona. Cultural Resources Report No. 10-430. SWCA Environmental Consultants, Tucson, Arizona.

Boloyan, David S.

- 2001 Archaeological Survey: Right-of-way Across Arizona State Trust Land, West from State Route 85, Maricopa County, Arizona. David S. Boloyan Archaeological Services. Tempe, Arizona.

Brown, David E.

- 1994 *Biotic Communities of the American Southwest*. General Technical Report No. RM-78. Rocky Mountain Forest and Range Experiment Station, USDA Forest Service, Fort Collins, Colorado.

Bureau of Land Management

- 2022 TR18.BLM Area of Potential Effect. Digital file (Map).

Czarzasty, John L.

- 2003 *A Supplemental Survey: Cultural Resources Survey of Arizona State Route 85 Gila Bend to Buckeye, Arizona Access Road at Station 5547+08*. Arizona State University. Tempe, Arizona.
- 2004 *A Supplemental Survey: Cultural Resources Survey of Arizona State Route 85 Gila Bend to Buckeye, Arizona. Project 3: Mile posts 125.85 to 128.32*. Arizona State University. Tempe, Arizona.

Goldstein, Beau

- 2005 Class III Cultural resources survey report of Approximately 40 acres for a proposed materials source North of Gila Bend Maricopa County, Arizona. Transcon Infrastructure, Inc. Mesa, Arizona.

Harmon, Elizabeth, L., Beyer, Lisa J., Woodall, Gregory R., Lite, Jeremy, and Jennifer Tweedy

- 1995 Cultural Resources Survey of Approximately 40 Miles of Proposed State Route 85 Right-of-way (and Associated Alternative Routes) between Gila Bend and Buckeye, Southwestern Maricopa County, Arizona. ARS Project Report 94:45. Archaeological

Research Services, Inc. Tempe, Arizona.

Laye, Richard C.

1981 *Letter to AZ State Land Department 5/22/81*. Arizona State Museum – Archaeology Section.

Macnider, Barbara S.

1989 *Archaeological Assessment of State Land Along Old U.S. Highway 80 Between Hassayampa and Gila Bend, Maricopa County, Arizona*. Archaeological Consulting Services. Tempe, Arizona.

Netronline

2023 Historical Aerial Viewer. Electronic document, <https://www.historicaerials.com/viewer>, accessed January 5, 2023.

Poseyesva, Lanell T.

2009 *Cultural Resources Inventory of a Portion of the Gila Bend to Cotton Center 69k VSub-Transmission Line across State and Bureau of Land Management Lands Northeast of Gila Bend, Maricopa County, Arizona*. ASLD Application No.14-114367; Report No.1520-09. EnviroSystemsManagement,Inc. Flagstaff, Arizona.

Punzmann, Walter

2012 *Class III Cultural Resources Assessment of 1,615 Acres of Arizona State Trust Land North of Gila Bend, Maricopa County, Arizona*. ACS Project No. 11-349:CSUR. Archaeological Consulting Services, Tempe.

Rogge, A.E.

1994 *Pacificorp Turbine Pipeline Project: A Class III Cultural Resource Survey*. Dames & Moore. Phoenix, Arizona.

Rogge, A.E., Suzanne M. Lewenstein, and Matthew E. Hill.

2000 *Cultural resource survey for the proposed Panda Gila River project*. Dames & Moore. Phoenix, Arizona.

Simonis, Donald E.

1981 Cotton Center Paloma project. Cultural Resources Clearance/Evaluation form. Manuscript on file. Bureau of Land Management. Planning Unit Report No. 11-26.

USDA Natural Resources Conservation Service

2018 *Web Soil Survey*. Electronic document, <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>, accessed January 3, 2023.

Watkins, Christopher D., E., and Scott Courtright

2011 *A Cultural Resources Survey on Federal and State Land of 58.06 Miles (351.87 Acres) of the Arizona Public Service M-108 (Bunyan-Aztec) 69-kV Transmission Line, 2.92 Miles (17.69 Acres) of the M-110 (Gila Bend-Bunyan) 69-kV Transmission Line, and 20.76 Miles (125.81 Acres) of the M-111 (Gillespie-Gila Bend) 69-kV Transmission*

Line in Maricopa and Yuma Counties, Arizona. LSD Technical Report 075107 (M-108a). Logan Simpson Design, Inc. Tempe, Arizona.