Hashknife Energy Center 500 kV Transmission Line Project
Application for Certificate of Environmental Compatibility

Prepared for:
State of Arizona Power Plant and Transmission Line Siting Committee

Arizona Corporation Commission

Submitted by:
Hashknife Energy Center LLC

Invenergy

1 S Wacker Drive, Suite 1800
Chicago, Illinois 60606

October 2020

EXECUTIVE SUMMARY

Pursuant to A.R.S § 40-360, *et seq.*, Hashknife Energy Center LLC ("Applicant") seeks approval of two separate Certificates of Environmental Capability ("CECs") for a proposed 500 kilovolt ("kV") alternating current generation transmission tie-in line ("Gen-tie") and associated substation facilities (collectively, "The Gen-Tie Project" or "Project"). The Gen-Tie Project will interconnect directly into the Arizona Public Service ("APS") owned 500kV Cholla Substation located at the Cholla Power Plant. Two CECs are required to address ownership of specific portions of the transmission line. The Applicant will own the portion of the transmission line from the generation source to the fence/property line of the Cholla Substation ("CEC-1"). APS will own the portion of the transmission line inside the fence/property line of the Cholla Substation ("CEC-2").

The Gen-Tie Project will deliver electricity from the Applicant's planned Hashknife Solar Project (Solar Facility), an up to 400-megawatt (MW) nameplate capacity solar photovoltaic power plant that may be paired with a battery energy storage system. Although the Applicant provides information related to the Solar Facility herein, the Applicant seeks a CEC only for the Gen-Tie project because the Solar Facility is not a thermal generation project.

Hashknife Energy Center LLC is a wholly owned subsidiary of Invenergy LLC (Invenergy). Invenergy is the world's largest private sustainable energy developer and operator. To date, Invenergy has developed more than 24,600 MW of large-scale wind, solar, natural gas and energy storage facilities in North America, Latin America, Japan and Europe. In addition to its generation portfolio, Invenergy has proven experience building transmission lines and has constructed 400 miles of transmission lines and currently operates 230 miles of transmission lines.

PROPOSED PROJECT

The Gen-Tie Project is comprised of a collection substation that will step-up electricity generated by the Solar Facility from 34.5kV to 500kV (the "Project Substation") and the Gen-Tie that will deliver the electricity to the regional transmission grid. CEC-1 for the Gen-Tie Project will originate at the Project Substation and will terminate at the point of ownership change immediately outside of the Cholla Substation fence/property line, a distance of approximately 3.2 miles. CEC-2 for the Gen-Tie Project will also include rebuilding a short portion of an existing APS 230kV line using double circuit structures that will also carry the new Gen-Tie from the Cholla Substation fence/property line into the point of interconnection at the APS owned Cholla Substation, a distance of =+/- 0.20 miles. The Gen-Tie Project will be located in unincorporated Navajo County, Arizona. Please see Figures 1 and 2 for more detail on the proposed preferred Gen-Tie Project route as well as the proposed alternative route.

The Project Substation will occupy an area of approximately four acres and will be located within the Solar Facility boundary. The preferred Gen-Tie line will be approximately 3.4 miles in length and will require a 200-foot Right of Way. In total, the Gen-Tie will encompass approximately 82.42 acres. The Gen-Tie will be three-phase 500kV with three conductors per phase. The Project will use up to 18 self-supporting lattice tower or steel monopole structures. The structures will be approximately 90 to 195 feet tall and will be spaced 800 to 1800 feet apart. Final design of the Gen-Tie will be subject to environmental constraints, topography, and siting variances.

PROJECT PURPOSE AND NEED

The Gen-Tie Project is needed to connect the associated Solar Facility to the transmission grid. The Gen-Tie Project is compatible with the existing rangeland and industrial uses of the surrounding area and will provide increased property tax revenue to the local community. It will also provide Arizona with a renewable energy resource to help meet its clean energy goals.

PROJECT DESCRIPTION

The Project Substation will be located on a roughly 400x400 ft (3.67 acre) tract within the Solar Facility Boundary. The Project Substation will include up to two main power transformers with, two sets of 500kV circuit breakers, 10-12 34.5kV breakers, switches, a control house, interconnection rigid steel buswork and jumper conductors, masts for lightning protection and an approximately seven-foot-tall fenced enclosure.

Both the preferred and alternative Gen-Tie Routes will originate at the Project Substation which will be located within the Solar Facility Boundary in unincorporated Navajo County, Arizona. The preferred route, approximately 3.4 miles, will run east from the Solar Facility Boundary for 3.2 miles to a point of ownership change just outside the Cholla Substation fence/property line (CEC-1) and continuing approximately 0.2 miles to until it terminates at the Cholla Substation (CEC-2). The alternative route, approximately 3.7 miles, will run east from the Solar Facility Boundary for 0.3 miles, where it will turn northeast and parallel the existing APS 345kV transmission lines. From the turning point, it will follow the existing transmission corridor for 3.2 miles to a point of ownership change just outside the Cholla Substation fence/property line (CEC-1) and continuing approximately 0.2 miles to until it terminates at the Cholla Substation (CEC-2).

ENVIRONMENTAL STUDIES AND PUBLIC OUTREACH OVERVIEW

The proposed preferred and alternative Gen-Tie routes were selected in order to minimize environmental impacts and to co-exist with existing land uses in the area.
Both the preferred and alternative Gen-Tie Routes will cross the Little Colorado River and the Burlington Northern Santa Fe (BNSF) Railway, which are both located adjacent to the Cholla Substation. The existing transmission infrastructure in the area also cross both the Little Colorado and the BNSF Railway. The Applicant surveyed the Little Colorado in compliance with applicable law and determined that the Gen-Tie Project would have minimal impact on the River or the Railway. The Applicant has also proactively consulted with the BNSF Railway company to ensure coordination throughout the siting and construction process.

The Applicant received a Special Use Permit in December of 2019 to construct the Solar Facility from Navajo County. As part of the County permitting process, the applicant held an open house on May 15, 2019 to understand potential concerns of the local community and receive feedback. No comments were received from the local community following the open house. In addition to the public hearing, the Applicant has also provided notice of the Gen-Tie Project to the following organizations and entities: Arizona Game and Fish Department (AGFD), Arizona State Land Department (ASLD), and eight different tribes including Kaibab Band of the Paiute, Navajo Nation, Paiute Tribe of Utah, San Carlos Apache Tribe, White Mountain Apache Tribe, Hopi Tribe, Las Vegas Tribe of the Paiute, and Moapa Band of the Paiute.

SUMMARY OF ENVIRONMENTAL COMPATIBILITY

Based on the criteria in A.R.S §40-360.6, the Applicant respectfully submits the Gen-Tie Project will be environmentally compatible. As described herein, the Applicant has diligently surveyed and mitigated environmental impacts associated with the Project and will continue to pursue development of the Project in a responsible manner. The Project is necessary to connect the associated Solar Facility to the regional transmission grid and will provide Arizona with a renewable resource to help meet its clean energy goals.

CONCLUSION

The application provides the information relevant to Arizona Administrative Code Rule R14-3-219 for the Hashknife Energy Center LLC Gen-Tie Project. Hashknife Energy Center LLC will develop the Project in a responsible manner and will minimize the environmental impacts associated with the Project. Hashknife Energy Center LLC respectfully requests that the Committee grant, and the ACC approve, the CECs for the construction of the Gen-Tie Project.

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APPLICATION

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

Hashknife Energy Center LLC
One South Wacker Dr, Suite 1800
Chicago, IL 60606

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

James Williams
Vice President, Renewable Development
Hashknife Energy Center LLC
1401 17th Street, Suite 1100
Denver, CO 80202
303-557-4488

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

Hashknife Energy Center LLC filed a Ten-Year Plan describing the Hashknife Energy Center Gen-Tie Project on January 31, 2020.

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

4a. "With respect to an electric generating plant:"
[not applicable]

4b. "With respect to proposed transmission line:"

4bi. "Nominal voltage for which the line is designed; description of the proposed structures and switchyards or substations associated therewith; and purpose for constructing said transmission line."

(1) Nominal Voltage:
The nominal voltage for the proposed Gen-Tie Project is 500kV alternating current, single circuit.

(2) **Description of proposed structures:**
The proposed structures for the Gen-Tie Project will be either steel monopoles, steel H-frame structures, steel 3-pole structures, or steel lattice structures and three phase 500 kV with three conductors per phase (CEC-1). The Gen-Tie will also use double circuit 500/230kV structures (CEC-2) Additionally, the Gen-Tie will have two overhead ground wires used for communication and lighting protection. The structures will be approximately 90 to 195 feet tall and will be spaced 800 to 1800 feet apart.

Conceptual drawings of the anticipated structures are shown in Exhibit G.

(3) Description of proposed substations:
The Project Substation will step up electricity generated by the Solar Facility from 34.5kV to 500kV. The Project Substation will include up to two main power transformers, two sets of 500kV circuit breakers, 10-12 34.5kV breakers, switches, a control house, interconnecting rigid steel buswork and jumper conductors, masts for lightning protection and an approximately seven-foot-tall fenced enclosure.

Please see Figure G-2 for a conceptual general arrangement of the proposed Project Substation.

(4) Purpose of constructing said transmission line:
The purpose of the Gen-Tie Project is to deliver power from the Solar Facility to the regional transmission grid. The Gen-Tie Project will provide Arizonans with a clean, renewable energy resource.

4bii. "Description of geographical points between which the transmission line will run, the straight-line distance between such points and the length of the transmission line for each alternative route for which application is made."

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

Preferred
The preferred route, approximately 3.4 miles, will run east from the Solar Facility Boundary for 3.2 miles to a point of ownership change just outside the Cholla Substation fence/property line (CEC-1) and continuing approximately 0.2 miles to until it terminates at the Cholla Substation (CEC-2).

Alternative
The alternative route, approximately 3.7 miles, will run east from the Solar Facility Boundary for 0.3 miles, where it will turn northeast and parallel the existing APS 345kV transmission lines. From the turning point, it will follow the existing transmission corridor for 3.2 miles to a point of ownership change just outside the Cholla Substation fence/property line (CEC-1) and continuing approximately 0.2 miles to until it terminates at the Cholla Substation (CEC-2).

Please see Figure 1 and Figure 2 for an illustration of the proposed preferred and alternative routes.

(2) Straight-line distance between such points:
The straight-line distance between the preferred route Project Substation and the Point of Interconnection at the Cholla Substation is approximately 3.2 miles. The straight-line distance between the alternative route Project Substation and the Point of Interconnection at the Cholla Substation is approximately 3 miles.

(3) Length of the transmission line for the alternative route:
The length of the transmission line for the alternative route is approximately 3.7 miles.

4biii. "Nominal width of Right-of-Way required, nominal length of spans, maximum height of supporting structures and minimum height of conductor above ground."

(1) Nominal width of Right-of-Way required:
The Gen-Tie project will require a 200-foot nominal Right-of-Way within a 1,000-foot corridor.

(2) Nominal length of spans:
The typical span length between structures is anticipated to be 1300 feet. Please note that this length is subject to final engineering design and may change to accommodate site-specific mitigation measures.

(3) Maximal height of structures above ground:
The height of the structures will not exceed 195 feet above ground.

(4) Minimum height of conductor above ground:
The minimum height of conductor above ground will be 30 feet at maximum operating temperature

4biv. "To the extent available, the estimated costs of the proposed transmission line and route, stated separately. (If application contains alternative routes, furnish an estimate for each route and a brief description of the reasons for any variations in such estimates.)"

(1) Depending on final design, the estimated cost for the proposed transmission line, the preferred route, and the Project Substation is up to $23M.

(2) Depending on final design, the estimated cost of the alternative route is an additional $1M.

4bv. "Description of proposed route and switchyard locations. (If application contains alternative routes, list routes in order of applicant's preference with a summary of reasons for such order of preference and any changes such alternative routes would require in the plans reflected in (i) through (iv) hereof)."

(1) Description of proposed route and switchyard locations:
The proposed preferred Gen-tie route is generally described in (ii) above and shown in Figure 1 and Figure 2.

The route starts at the preferred Project Substation location, which will be located on Applicant-controlled private land within the proposed Solar Facility, 2 miles west of Obed Road. The Project Substation is located on flat ground previously used for ranching. The preferred Gen-Tie route will head east from the Solar Facility Boundaries for approximately 2.5 miles, where it will turn and head northeast for approximately 0.60 miles. The route then turns and runs southeast for 0.10 miles to the Cholla Substation fence/property line (CEC-1) and continues southeast approximately 0.2 miles to until it terminates at the Cholla Substation inside the fence/property line (CEC-2).

(2) Description of alternative route and switchyard locations:
The proposed alternative Gen-tie route is generally described in (4.b.ii) above and shown in Figure 1 and Figure 2.

The route starts at the alternative Project Substation location, which will be located on Applicant-controlled private land within the proposed Solar Facility, 1 mile west of Obed Road. The Project Substation is located on flat ground previously used for ranching. The alternative Gen-Tie route will head east from the Solar Facility Boundaries for approximately 0.3 miles where it will turn northeast and parallel the existing APS 345kV transmission lines. From the turning point, it will follow the existing transmission corridor northeast for 2.2 miles;: north 0.70 miles, northeast 0.15 miles, southeast 0.15 miles to the Cholla Substation fence/property line (CEC-1) and continues southeast approximately 0.2 miles to until it terminates at the Cholla Substation inside the fence/property line (CEC-2).

Summary of reasons for such order of preference:
The proposed preferred route was selected to optimize the interconnection to the Cholla Substation including:

- Minimizing potential conflict with existing transmission lines including overhead crossings.
- Reducing the number of turning structures required to cross the river and railroad tracks.
- Paralleling existing road to minimize construction disturbance.
- Provides access to solar field substation location where terrain and subsurface geology are favorable.
- Located predominantly on land owned by Aztec Land and Cattle Company, who supports the project.

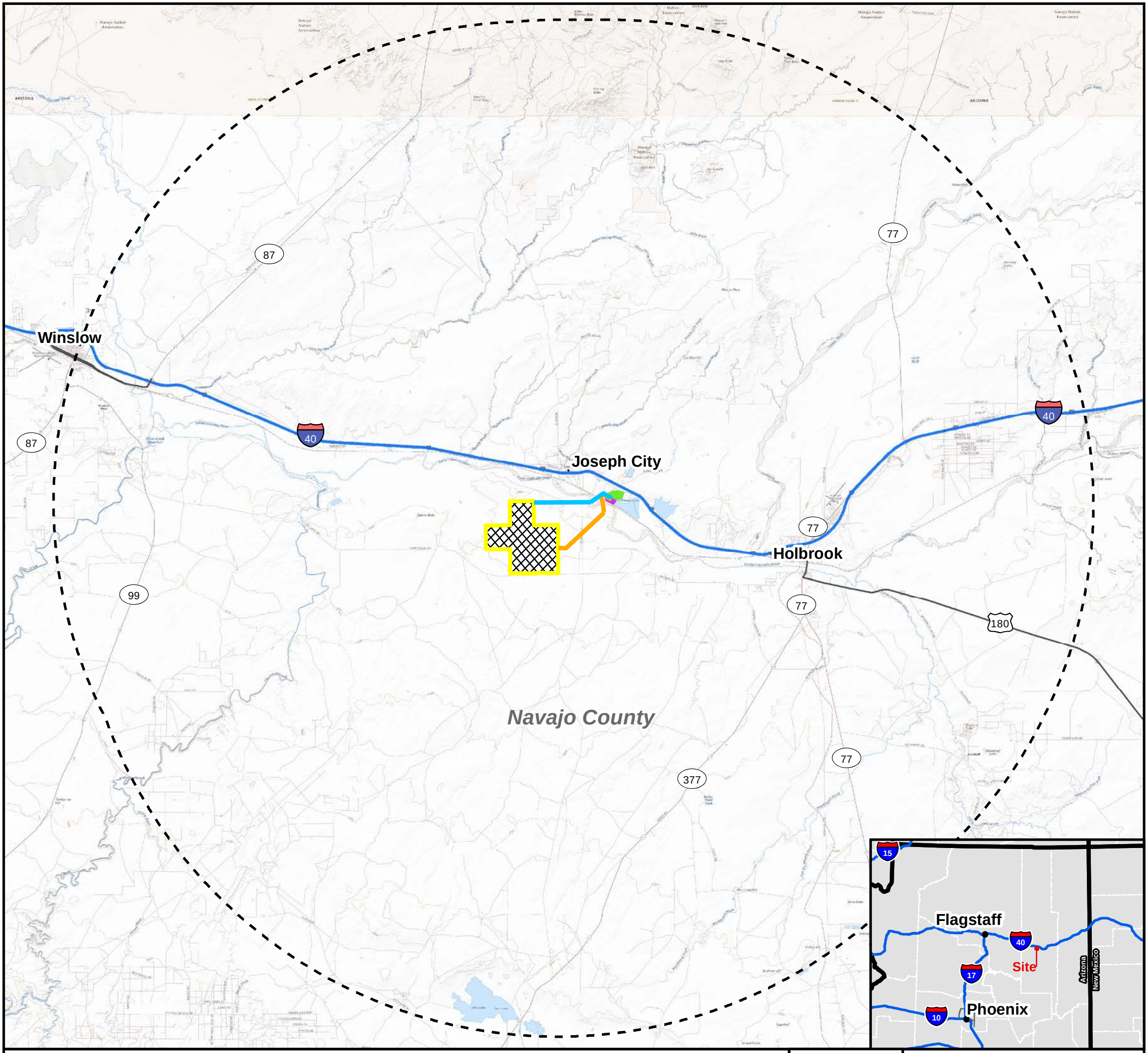
4bvi. "For each alternative route for which application is made, list the ownership percentages of land traversed by the entire route (federal, state, Indian, private, etc.)."
The Gen-Tie and Project Substation will be located on private land. Hashknife Energy Center currently has easements across 100% of the private land for both the preferred and alternative route. The land for the remaining easement rights are exclusively owned by APS.

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

In the preferred and alternative route, the Gen-Tie Project will fall within Navajo County's jurisdiction. The Applicant received a Special Use Permit in December of 2019 approving the Solar Facility as a conditional use for the parcels within the Solar Facilities boundary. Under Navajo County's Zoning Ordinance, Section 402(6) Article 4, the Project Substation and Gen-Tie are permitted uses within all of the parcels along the preferred and alternative route.

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

   The Applicant has evaluated available desktop data as well as field data related to biological resources, visual resources, cultural resources, land use, noise levels, and communication signals in order to assess the potential impacts that may result from the construction, operations and maintenance of the Gen-Tie Project. The evaluations are included in Exhibits B, C, D, E, F, H, and I of this Application.



Project Features

- Project Study Area 20 Mile Buffer
- Hashknife Energy Center LLC
- Cholla Power Plant
- Cholla Substation

Proposed Transmission Line Routes

- Preferred
- Alternate

Reference Features

- Interstate
- Highway
- Rail Road

NORTH

0 4 8

Miles

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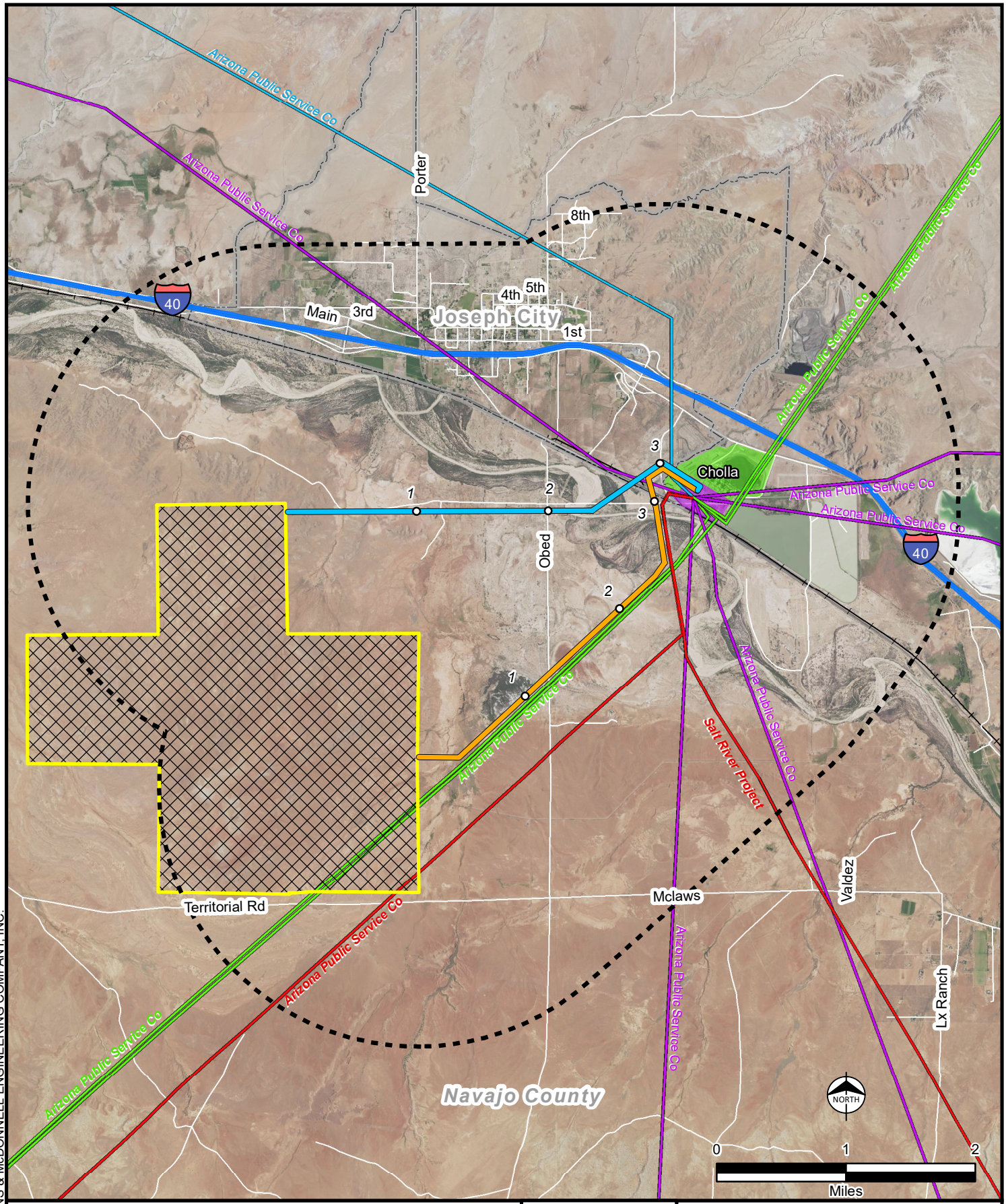
Figure 1
Project Vicinity
Hashknife Energy Center LLC
Navajo County
Joseph City, Arizona

Source:Energy Velocity, Invenergy, Burns & McDonnell Engineering, Inc.

Issued: 8/7/2020



Project Features
- Project Area 2 Mile Buffer
- Hashknife Energy Center LLC
- Cholla Power Plant
- Cholla Substation

Proposed Transmission Line Route
- Preferred
- Alternate

Existing Transmission Line
- 69 kV
- 230 kV
- 345 kV
- 500 kV

Reference Features
- Interstate
- Highway
- Local Road
- Rail Road
- City Limts

Invenergy

BURNS McDONNELL

Figure 2
Project Area
Hashknife Energy Center LLC
Navajo County
Joseph City, Arizona

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Source:Energy Velocity, Invenergy, Burns & McDonnell Engineering, Inc.

Issued: 8/7/2020

EXHIBIT A – LOCATION MAP AND LAND USE INFORMATION

Arizona Revised Statutes (ARS) §40-360 et seq. established the Power Plant and Transmission Line Siting Committee (Siting Committee) in 1971. ARS §40-360.06(A)(1) stipulates "existing plans of the state, local government and private entities for other developments at or in the vicinity of the proposed site" are among the factors the Siting Committee must consider in reviewing CEC applications. The Arizona Corporation Commission (ACC) Rules of Practice and Procedure R14-3-219 that implement ARS §40-360 et seq. stipulate that applicant provides the following location maps and land use information:

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

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

INTRODUCTION

The Project Study Area is defined as all areas within a 2-mile radius of the preferred and alternative generation Gen-tie alignments identified in this application. The Project corridor is defined as the land area within which the preferred Gen-tie will be constructed, consisting of a combination of the Applicant, APS (Parcels 107-22-003C, 107-21-013A, 107-21-013B, 107-21-011, 107-21-010B, 107-05-042 and 107-05-018A), Aztec Land Company LLC (Parcels 107-05-024 and 107-05-031D) and Aztec East Jeffers LLC (Parcel 107-20-019).

Following the Applicant's selection of a solar facility site, possible transmission line routes were identified to interconnect the solar facility to the Cholla Substation at the Cholla Power Plant, which is owned and operated by APS. The approximately 3.4-mile preferred Gen-tie route, including the on-site Project Substation, is sited on private land in previously disturbed areas. The preferred Gen-tie will be designed to cross over the Little Colorado River and the BNSF Railway as well as the existing APS 69kV and 230kV transmission lines before entering into the Cholla Substation. The approximately 3.7-mile alternative Gen-tie route will parallel on the north side of two (2) APS 345kV transmission lines for a portion, and will be designed to cross the Little Colorado River and the BNSF Railway as well as the existing APS 69kV and 230kV transmission lines before entering the Cholla Substation.

LAND USE OVERVIEW

The following required figures are included to support the land use studies conducted for this application:

- Figure A-1 illustrates land ownership and surface jurisdiction within the Study Area.
- Figure A-2 illustrates existing land uses within the Study Area.

- Figure A-3 illustrates future land uses within the Study Area.

Figures A-2 and A-3 illustrate the data collected for land use study. The following describes the inventory methods and impact assessment results of the land use study for the Project.

Inventory

A land use inventory, including existing and future land uses, was completed in order to identify and map land uses in the Study Area. Methods used for the land use inventory included field verification and review and interpretation of maps, aerial imagery, comprehensive plans, general plans, and other documents. In addition, this inventory included communication with governmental agencies within the Project Study Area for information regarding development plans and known planned projects.

Jurisdiction and Land Ownership

The Project is located on privately owned property, under the jurisdiction of Navajo County. In addition, portions of the Study Area include lands owned by the State of Arizona and lands that are managed by the Bureau of Land Management (BLM) (Exhibit A-1).

Existing Land Use

Existing land uses within the Study Area are mapped on Exhibit A-2, and include industrial, utilities, agricultural, range land, residential, commercial, recreation, transportation, education, and vacant land. Overall, the vicinity of the Project is land used for ranching with existing utility infrastructure and scattered industrial, residential, and commercial uses to the north. Industrial and utility development is clustered around the Cholla Power Plant. Land uses in the immediate vicinity of the Project include mostly ranching and utilities such as the Cholla Power Plant that has various transmission lines with different voltages coming in and out of it. The land uses identified in A-2 are described below.

Industrial – Industrial land uses within the Study Area include a waste transfer station southeast of Joseph City. There are numerous water wells spread throughout the Study Area as a result of a proven, fully developed, high capacity well field where geologic conditions produce high quality groundwater in high volumes at relatively shallow pumping depths. APS's Cholla Power Plant is located southeast of Joseph City. There are a series of transmission line corridors which bisect portions of the Study Area that originate from the Cholla Power Plant, including voltages of 500kV, 345kV, 230kV and 69kV.

Utilities – Utilities within the Study Area include the Cholla Substation as part of the Cholla Power Plant, which accommodates various transmission lines coming in and out with voltages ranging from 500kV to 69kV making the area ideal for solar development. Numerous electrical distribution lines and ditches are located within the Study Area including a large communications tower in the south-central portion. There is also a high-pressure natural gas pipeline that runs north/south through the central portion of the Study Area.

Agriculture – Agriculture is a fairly minor use of the land within the Study Area and consists of a single small plot located in the northeast section of the Study Area located on the south side of Interstate 40, just north of a cemetery. There are also few larger plots in the northwest section of Joseph City.

Range Land – Ranching is the principal use for the majority of land within the Study Area. All of the land is owned by the Aztec Land and Cattle Company and is leased for cattle grazing activities including multiple ranch corrals throughout the Study Area.

Residential – With the exception of one small residence in the center of the Study Area, all of the residential land uses are concentrated within the jurisdiction of Joseph City or just south of town on the south side of Interstate 40. Roughly one third of properties in Joseph City were constructed in the 1960s and 1970s, while many of the remaining buildings were built pre-1960 and in the 1980s. Around 60% of buildings are single detached homes, and the remaining dwellings are mainly mobile homes. Homeowners occupy around two thirds of the properties in Joseph City and the rest are rented.

Commercial – The majority of Commercial uses are clustered along the northern fringe of the Study Area and are included as part of the Mixed Use Residential/Commercial section contained within the jurisdictional boundaries of Joseph City. Commercial uses located in the Study Area include various restaurants, auto repair shops and a large truck stop at the east end of town.

Recreation – Recreation land uses within the Study Area include the Norma's and McTribe RV Parks in Joseph City.

Transportation – The main transportation facilities within the Study Area include Interstate 40 and a portion of Route 66, both run east/west along the northern section of the Study Area. The main county road that runs north/south through the center of the Study Area is called Obed Road, which will be used to access the proposed solar facility site. The main county road that runs east/west is on the southern side of the Study Area and is called Territorial Road west of Obed Road and is called McLaws Road east of Obed Road. There are various streets and avenues that make up the roadways within Joseph City. The mainline of the BNSF railroad runs through the northern part of the Study Area. The BNSF mainline can accommodate up to 120 trains per day passing Holbrook, which is approximately 6 miles east of the Study Area. Most of the freight is inter-modal heavy freight although it also carries Amtrak passenger service with daily stops in Winslow, which is approximately 18 miles west of the Study Area.

Education – Both the Joseph City Junior/Senior High School and Joseph City Elementary School are located in the north central part of the Study area, within the jurisdiction of Joseph City.

Vacant land – Numerous tracts of privately, publicly and State owned vacant undeveloped land are located within the Study Area.

Future Land Use

Future land uses are illustrated in Exhibit A-3. This data was derived from the following plans:

- Navajo County Approved Comprehensive Plan (2011)
- Navajo County Character Areas Map (2003)
- Aztec Area Plan (2011)

The comprehensive and general plans present a series of policies and recommendations for Navajo County. The policies and recommendations listed within each plan establish a basic direction and approach to guide future growth and development in the County.

The Project is all located in unincorporated Navajo County and primarily within an area designated as Range Land by the 2003 Navajo County Character Areas Map and the 2011 Navajo County Comprehensive Plan, with a small section designated as Community Village. The Project area and the parcels immediately adjacent to it are currently zoned Rural Zoning District Twenty (RU-20) and Rural District One (RU-1). Under Section 402(6) of Article 4 in the Navajo County Zoning Ordinance, electric power generating plants and facilities like a solar project are a permitted special use within both RU-20 and RU-1; the Project Substation and Gen-Tie are permitted uses within all of the parcels along the preferred and alternative route.

The Applicant submitted a Special Use Permit Application to Navajo County in August of 2019 and received approval from the Navajo County Board of Supervisors on November 12, 2019.

Designated future land uses within the Project Study Area include:

- Range Land
- Community Village
- Rural Ranch

Impact Assessment and Results

Land use impacts may be defined primarily as restrictions on a land use that would result from the construction or operation of the Project, or incompatibility with existing land use plans. Typically, restrictions on a land use would result from Right-of-Way or easement acquisition across a property.

In order to minimize land use impacts, the solar facility site was located in an area with existing adjacent industrial/utility compatible land uses. The preferred Gen-tie route was sited to minimize the required distance by placing the associated substation site in close proximity to APS's Cholla Power Plant. The solar facility site will replace approximately 3,840 acres of disturbed state and private range land and the preferred Gen-tie route will replace approximately 42 acres of disturbed private range land.

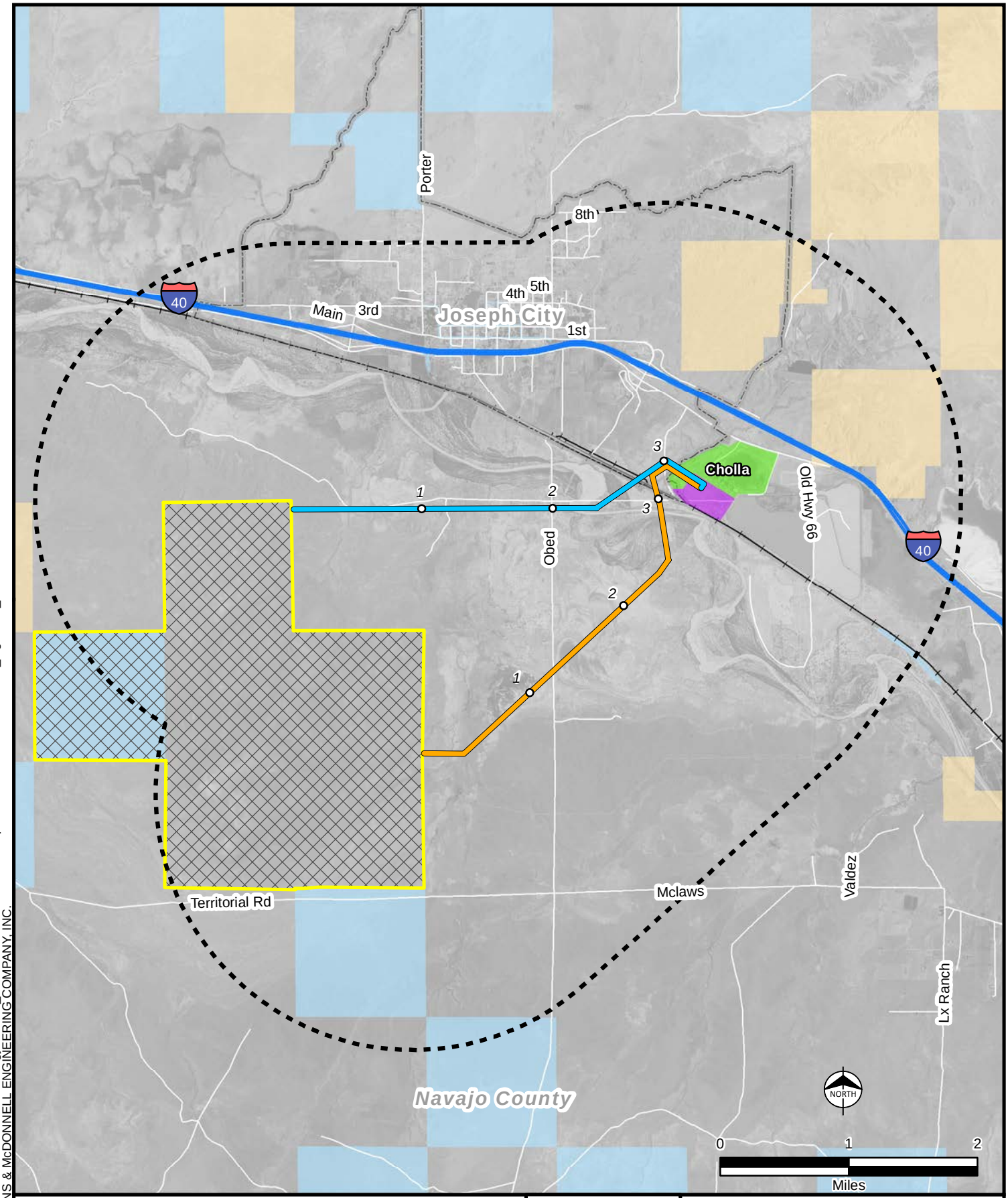
The Project is located on parcels controlled by the Applicant or within the existing APS Cholla Power Plant with existing range land and industrial/utility land uses. Impacts to these existing land uses resulting from the Project are expected to be negligible. The Navajo County Comprehensive Use Plan designates the Project site as predominantly Range Land. The Project is consistent with the goal under Section 2.2 of the Comprehensive Use Plan to enable access to incident solar energy for all character areas and will coexist with minimal intrusion on adjacent property.

REFERENCES

Navajo County. 2011. Approved Comprehensive Plan. Available at: https://www.navajocountyaz.gov/Portals/0/Departments/Planning%20and%20Zoning/Documents/Comprehensive%20Plan-NavajoCounty-AdoptedMay_24_2011.pdf

Navajo County, 2003, Character Areas Map. Available at: https://www.navajocountyaz.gov/Portals/0/Departments/Planning%20and%20Zoning/Document/CharacterAreasMap.pdf

Navajo County, 2011, Aztec Area Plan. Available at: https://www.navajocountyaz.gov/Portals/0/Departments/Planning%20and%20Zoning/Documents/Aztec%20Area%20Plan%20%20as%20Adopted%20by%20the%20BOS%20on%20May%2024,%202011.pdf



Project Features
- Project Area 2 Mile Buffer
- Hashknife Energy Center LLC
- Cholla Power Plant
- Cholla Substation

Proposed Transmission Line Routes
- Preferred
- Alternate

Land Ownership/Jurisdiction
- State
- Bureau of Land Management
- Private

Reference Features
- Interstate
- Highway
- Local Road
- Rail Road
- City Limts

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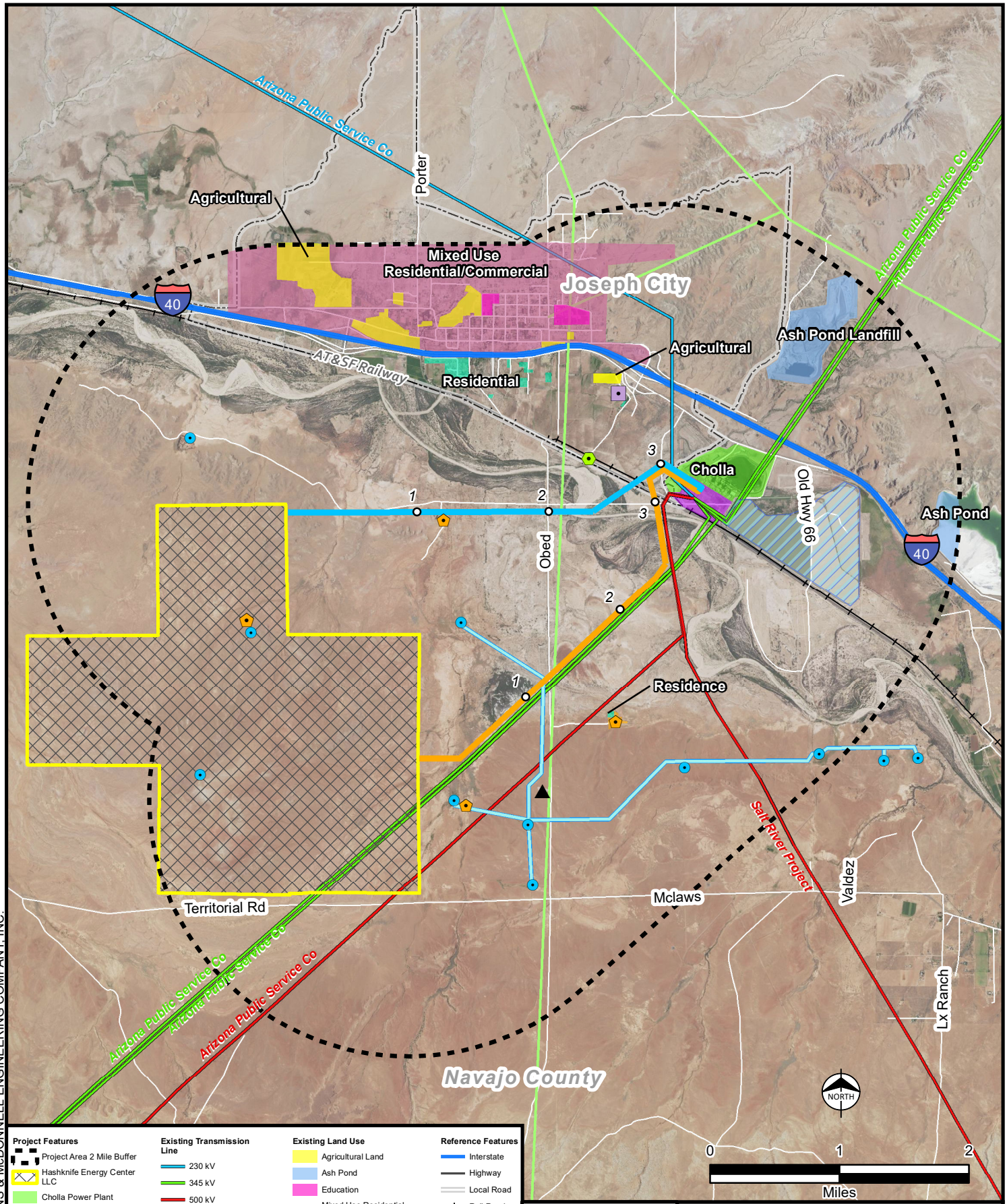
A-1
Land Ownership and Jurisdiction
Hashknife Energy Center LLC
Navajo County
Joseph City, Arizona

Source:Energy Velocity, Invenergy, Burns & McDonnell Engineering, Inc.

Issued: 8/7/2020



Project Features
- Project Area 2 Mile Buffer
- Hashknife Energy Center LLC
- Cholla Power Plant
- Cholla Substation

Proposed Transmission Line Corridors
- Preferred
- Alternate

Existing Transmission Line
- 230 kV
- 345 kV
- 500 kV

Existing Features
- Cemetery
- Communication Tower
- Ranch Corral
- Water Well/Tank
- Waste Transfer Station
- Natural Gas Pipeline
- Water Pipeline

Existing Land Use
- Agricultural Land
- Ash Pond
- Education
- Mixed Use Residential Commercial
- Reservoir
- Residential

Reference Features
- Interstate
- Highway
- Local Road
- Rail Road
- City Limts

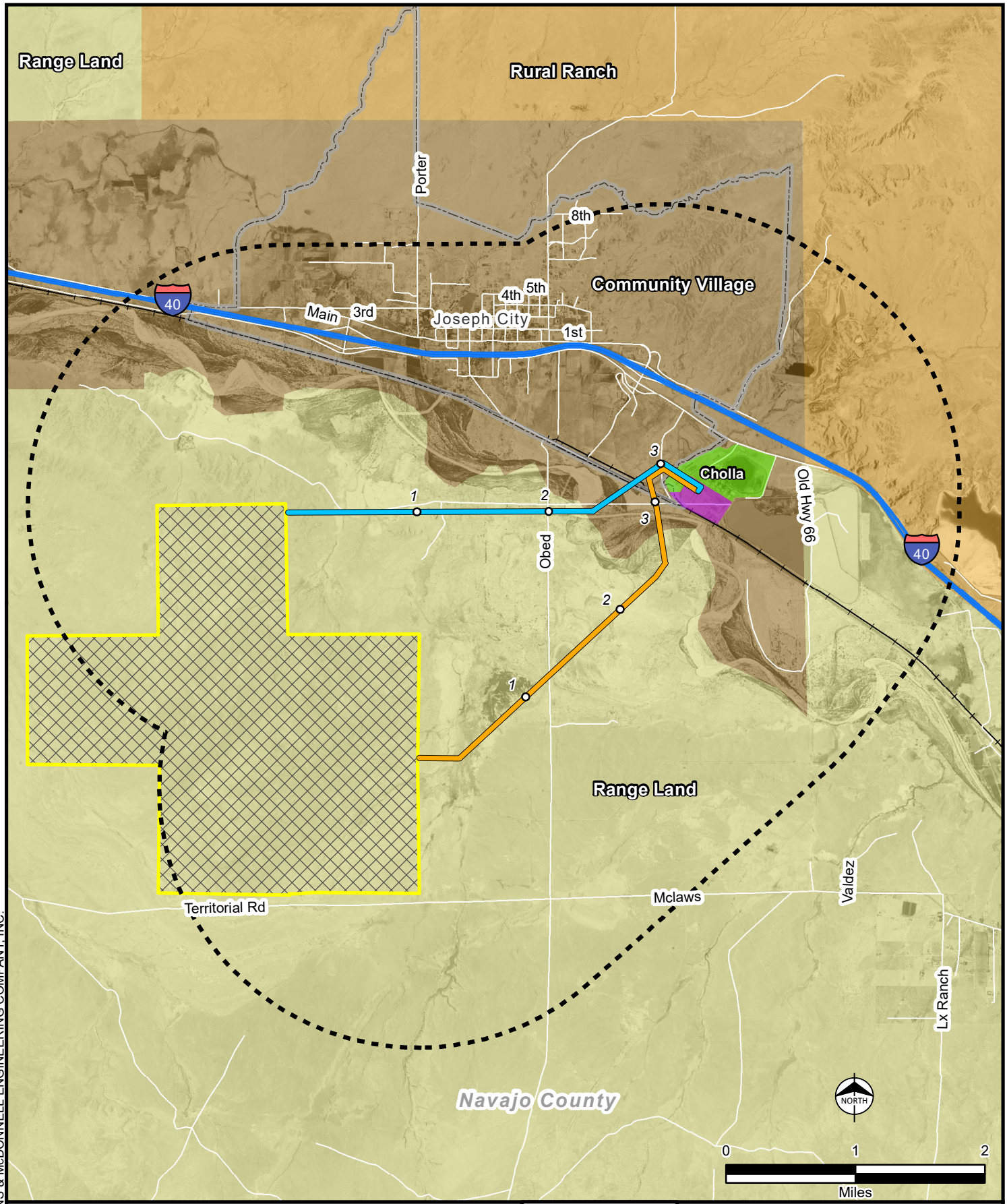
Invenergy

BURNS McDONNELL

A-2
Existing Land Use
Hashknife Energy Center LLC
Navajo County
Joseph City, Arizona

Source: Google Earth, Energy Velocity, Invenergy, Burns & McDonnell Engineering, Inc.

Issued: 8/7/2020



Project Features
- Project Area 2 Mile Buffer
- Hashknife Energy Center LLC
- Cholla Power Plant
- Cholla Substation

Proposed Transmission Line Routes
- Preferred
- Alternate

Comprehensive Plan Character Areas
- Community Village
- Range Land
- Rural Ranch

Reference Features
- Interstate
- Highway
- Local Road
- Rail Road
- City Limts

Invenergy

BURNS McDONNELL

A-3
Future Land Use
Hashknife Energy Center LLC
Navajo County
Joseph City, Arizona

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Source:Energy Velocity, Invenergy, Burns & McDonnell Engineering, Inc. Navajo County - Aztec Area Plan

Issued: 8/7/2020

EXHIBIT B – ENVIRONMENTAL STUDIES

Arizona Revised Statutes (ARS) §40-360 et seq. established the Power Plant and Transmission Line Siting Committee in 1971. ARS §40-360.06(A)(6) stipulates "the total environment of the area" are among the factors the Siting Committee must consider in reviewing CEC applications. As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

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

Supplemental environmental studies are included as reports in the following appendices:

- Appendix B-1 – Tier 1 Preliminary Site Evaluation and Tier 2 Site Characterization Report
- Appendix B-2 – Wetlands and Other Waters of the U.S. Delineation Report

APPENDIX B-1 – TIER 1 PRELIMINARY SITE EVALUATION AND TIER 2 SITE CHARACTERIZATION REPORT

Tier 1 Preliminary Site Evaluation and Tier 2 Site Characterization Report, Hashknife Energy Center Navajo County, Arizona

JULY 2020

PREPARED FOR

Hashknife Energy Center LLC

PREPARED BY

SWCA Environmental Consultants

TIER 1 PRELIMINARY SITE EVALUATION AND TIER 2 SITE CHARACTERIZATION REPORT HASHKNIFE ENERGY CENTER NAVAJO COUNTY, ARIZONA

Prepared for

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June 2020

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Appendices

Figures

Tables

1.0 INTRODUCTION

Hashknife Energy Center LLC is proposing to build a solar energy facility located approximately 2 miles south of Joseph City and Interstate 40 in Navajo County, Arizona (Figure 1.1). The proposed Hashknife Energy Center (herein called the Project) is a proposed 400-megawatt nameplate capacity facility encompassing approximately 3,216 acres of privately-owned land and 628 acres of Arizona State Trust Lands. Two proposed electrical generation tie routes crossing privately-owned lands connect the Project to an electrical substation approximately 2.4 miles to the northeast. A smaller portion of the Project area was evaluated in April 2019. In 2020, the Project area was expanded to include additional land for the main Project area and the proposed electrical generation tie routes (Figure 1.1). The main Project area and two proposed electrical generation tie routes (herein called the Project area) are located within portions of Township 17 North, Range 19 East; Township 18 North, Range 18 East; and Township 18 North, Range 19 East, Gila and Salt River Baseline and Meridian.

The objective of this report is to assess the habitat and physical landscape characteristics of the Project area including potential use by sensitive species and other wildlife. Objectives also include analysis of sensitive habitat designations and verified habitat types determined from aerial imagery and the U.S. Geological Survey (USGS) Southwest Regional Gap Analysis Program (SWReGAP) land cover database (USGS 2016). Study objectives were to provide information needed to address questions posed under the Tier 1 Preliminary Site Evaluation and Tier 2 Site Characterization Study tiers of the U.S. Fish and Wildlife Service's (USFWS's) *Land-Based Wind Energy Guidelines* (USFWS 2012). Additionally, site evaluation and characterization screening methods follow the AGFD's recommended *Guidelines for Solar Development in Arizona* (AGFD 2010).

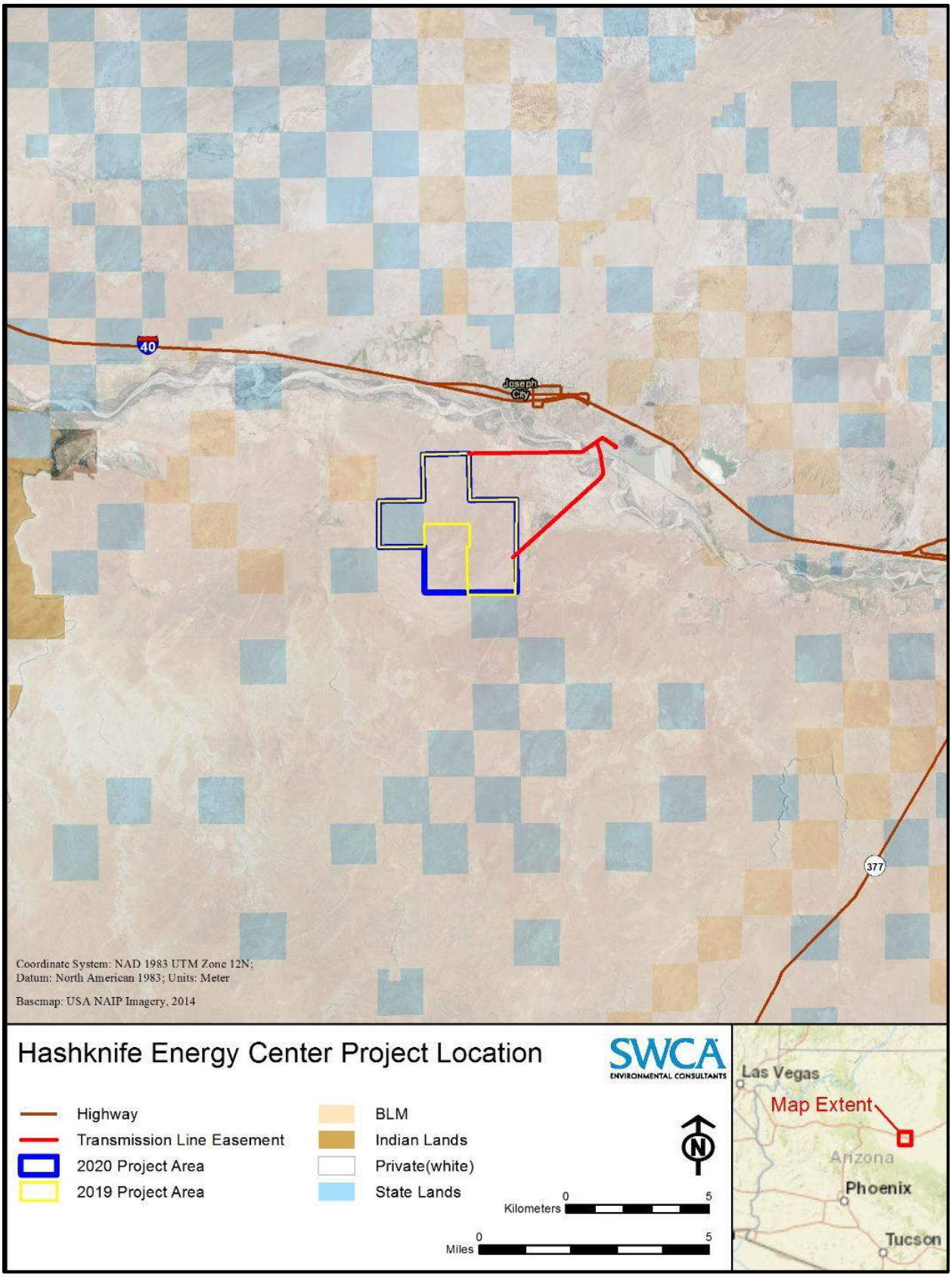

Figure 1.1. Proposed Hashknife Energy Center Project location. Navajo County, AZ

2.0 METHODS

The preliminary site assessment and site characterization were completed using a combination of existing information obtained from publicly available sources including reports, published literature, online agency databases, geographic information system (GIS) data, and field reconnaissance.

2.1 Existing Information from Publicly Available Sources

SWCA Environmental Consultants (SWCA) reviewed multiple environmental and biological data sources to collect existing environmental and biological data for the proposed Project area and out to a 2.5-mile buffer[1]. Through that process, the following documents and online sources were reviewed:

- AGFD's HabiMap Online Project Evaluation Tool (AGFD 2019a) and Arizona Heritage Geographic Information System Online Environmental Review Tool (AGFD 2019b; Appendix A)
- USGS provisional digital land cover map for the Southwestern United States (USGS 2004)
- USFWS Information for Planning and Consultation (IPaC) online mapping tool (USFWS 2019a; Appendix B)
- Biotic Communities: Southwestern United States and Northwestern Mexico (Brown 1994)
- USFWS Birds of Conservation Concern (USFWS 2008) Audubon Society Christmas Bird Counts (2019a)
- Audubon Society Important Bird Areas (2019b)
- USGS's North American Breeding Bird Survey Database (2019)
- USFWS National Wetlands Inventory (NWI) (USFWS 2019b; Appendix C)
- Arizona Department of Transportation (ADOT), Arizona Wildlife Linkages Assessment Tool (ADOT 2006; Appendix E)
- SWReGAP land cover database (USGS 2016).

From these sources, SWCA created a land cover map, a NWI wetlands map, and a list of sensitive species of concern potentially occurring in the Project area and their typical habitat requirements.

2.2 Field Reconnaissance

An SWCA ecologist with expertise in the ecology and natural history of flora and fauna in the region conducted field reconnaissance surveys on April 8 and 9, 2019, and July 13, 202 within the Project area. Reconnaissance included ground-based (pedestrian and windshield) surveys to identify and document the vegetative communities, potential foraging resources, topography, and other habitat features to evaluate potential wildlife usage within the Project area. This reconnaissance survey also addressed and verified the habitat types within the Project area to assess whether there is suitable habitat for federally listed and other special-status species at the site. The field reconnaissance was conducted to complete the following:

[1] AGFD's Environmental Online Review Tool uses a 5 mile buffer around the Project area in determining the list of special status species potentially occurring within and near the Project area.

- ground-truth SWReGAP (USGS 2016) land cover types and locations
- document areas where land cover types provide habitat for species of concern
- document readily observable features that may attract wildlife, if any
- general raptor nest survey
- record incidental wildlife observations while on-site

SWCA accessed the Project area via public roads and recorded the predominant vegetative types and dominant plant species. Field observations were compared to the SWReGAP classification system criteria and either confirmed or reclassified.

To document areas where SWReGAP land cover types may provide habitat for species of concern, the species lists developed from existing information, including field-verified land cover types, were consulted during the field reconnaissance. For species with specific or narrowly defined habitat requirements, accessible, likely suitable areas were inspected for the specific habitat requirements to determine if suitable habitat was present. The presence or absence of the specific habitat requirements was recorded.

To document any readily observable features that may attract wildlife, the species list developed from existing information (see Section 2.1) was consulted during the field reconnaissance, and the locations of features (such as abandoned buildings, lakes with large trees, raptor nests, snags, livestock operations, topographic features such as ridgelines, etc.) that are known wildlife attractants (based on the sources listed in Section 2.1) were mapped and any features were briefly described.

While conducting the field reconnaissance, incidental wildlife observations were noted, including species, age class, and sex (if possible), location, and behavior.

3.0 RESULTS

3.1 Land Cover

The biotic communities present within the Project area and out to a 2.5-mile buffer (recommended per AGFD recommended guidelines [2010]; Figure 3.1) are classified as Great Basin Desertscrub and Plains and Great Basin Grassland (Brown 1994) (Appendix D, Photo D.1). The elevation within the Project area ranges from approximately 5,000 to 5,130 feet above mean sea level (amsl). Figure 3.1 depicts the SWReGAP (USGS 2016) provisional digital vegetation and land cover in the Project area and out to a 2.5-mile buffer.[2] Based on the vegetation and land cover data (see Figure 3.1), seven vegetation types are present within the Project area, with an additional 11 cover types occurring within the 2.5-mile buffer. The site reconnaissance was conducted only within the Project limits to confirm the SWReGAP data. Confirmation included that the dominant vegetation assemblage occurring within the Project area is Inter-Mountain Basins Semi-Desert Grassland. Also found within the Project area are Inter-Mountain Mixed Salt Desert Scrub, Southern Colorado Plateau Sand Shrubland, Inter-Mountain Basins Greasewood Flats, Inter-Mountain Basins Big Sagebrush, Inter-Mountain Basins Semi-Desert Shrub Steppe, and

[2] Although Figure 3.1 depicts vegetation and land cover out to a 2.5-mile buffer surrounding the Project area, a reconnaissance survey was not conducted within the buffer area largely due to prohibited access to private lands. USGS (2011) provisional digital vegetation and land cover within a 2.5-mile buffer was included in the figure to depict vegetation and land cover types adjacent to the Project area.

Invasive Southwest Riparian Woodland and Shrubland. Table 3.1 lists all of the cover types found within the 2.5-mile buffer.

Along the existing transmission line, soils are sandy, but no dunes are present (see Appendix D, Photo D.2). No rock outcrops are found along the line. Within the proposed Project area, soils are also sandy, but rockier than those observed in the transmission line alignment. There are no dunes present, and no large trees. Rolling hills, small washes, and several low rock outcrops are found within the Project area (See Appendix D, Photo D.3). Vegetation observed within the Project area includes native shrubs such as fourwing saltbush (*Atriplex canescens*), Torrey's jointfir (*Ephedra torreyana*), big sagebrush (*Artemisia tridentata*), and broom snakeweed (*Gutierrezia sarothrae*). Spring annuals observed include cleftleaf wildheliotrope (*Phacelia crenulata*), western tansymustard (*Descurainia pinnata*), tufted evening primrose (*Oenothera caespitosa*), thicksepal cryptantha (*Cryptantha crassisepala*), and milkvetch (*Astragalus* spp.). Dominant native grasses observed include sand dropseed (*Sporobolus cryptandrus*), mesa dropseed (*Sporobolus flexuosus*), and ring muhly (*Muhlenbergia torreyi*). Invasive species observed were camelthorn (*Alhagi maurorum*) and prickly Russian thistle (*Salsola tragus*). Additional species observed include Emory's globemallow (*Sphaeralcea emoryi*), plains pricklypear (*Opuntia polyacantha*), soapweed yucca (*Yucca glauca*), and rubber rabbitbrush (*Ericameria nauseosa*).

Table 3.1. Southwest Regional Gap Analysis Project Land Cover Types within the Hashknife Energy Center Project Area, including a 2.5-mile Buffer

Cover Type	Acres	Hectares	Percent (%)
Inter-Mountain Basins Semi-Desert Grassland	16,828	6,810	50.0
Inter-Mountain Basins Mixed Salt Desert Scrub	6,570	2,659	19.5
Inter-Mountain Basins Semi-Desert Shrub Steppe	4,014	1,624	11.9
Southern Colorado Plateau Sand Shrubland	2,711	1,097	8.1
Invasive Southwest Riparian Woodland and Shrubland	979	396	2.9
Developed, Open Space - Low Intensity	535	217	1.6
Inter-Mountain Basins Greasewood Flat	495	200	1.5
Inter-Mountain Basins Big Sagebrush Shrubland	386	156	1.1
Colorado Plateau Blackbrush-Mormon-Tea Shrubland	257	104	0.8
Colorado Plateau Pinyon-Juniper Woodland	230	93	0.7
Agriculture	254	103	0.8
Developed, Medium - High Intensity	175	71	0.5
Barren Lands, Non-specific	48	19	0.1
Open Water	31	13	0.1
Colorado Plateau Mixed Bedrock Canyon and Tableland	50	20	0.1
Colorado Plateau Mixed Low Sagebrush Shrubland	15	6	<0.1
Inter-Mountain Basins Juniper Savanna	6	2.4	<0.1
Inter-Mountain Basins Shale Badland	1	0.4	<0.1

Cover Type	Acres	Hectares	Percent (%)
Total	**33,660**	**13,622**	**100**

Source: SWReGAP (USGS 2016)

Table 3.2. Southwest Regional Gap Analysis Project Land Cover Types within the Hashknife Energy Center Project Area

Cover Type	Acres	Hectares	Percent (%)
Inter-Mountain Basins Semi-Desert Grassland	2,340	947	60.9
Inter-Mountain Basins Mixed Salt Desert Scrub	589	238	15.3
Southern Colorado Plateau Sand Shrubland	583	236	15.2
Inter-Mountain Basins Semi-Desert Shrub Steppe	198	80	5.2
Colorado Plateau Blackbrush-Mormon-Tea Shrubland	86	35	2.2
Inter-Mountain Basins Big Sagebrush Shrubland	25	10	0.7
Inter-Mountain Basins Greasewood Flat	20	8	0.5
Invasive Southwest Riparian Woodland and Shrubland	4	2	0.1
Total	**3,844**	**1,555**	**100**

Source: SWReGAP (USGS 2016)

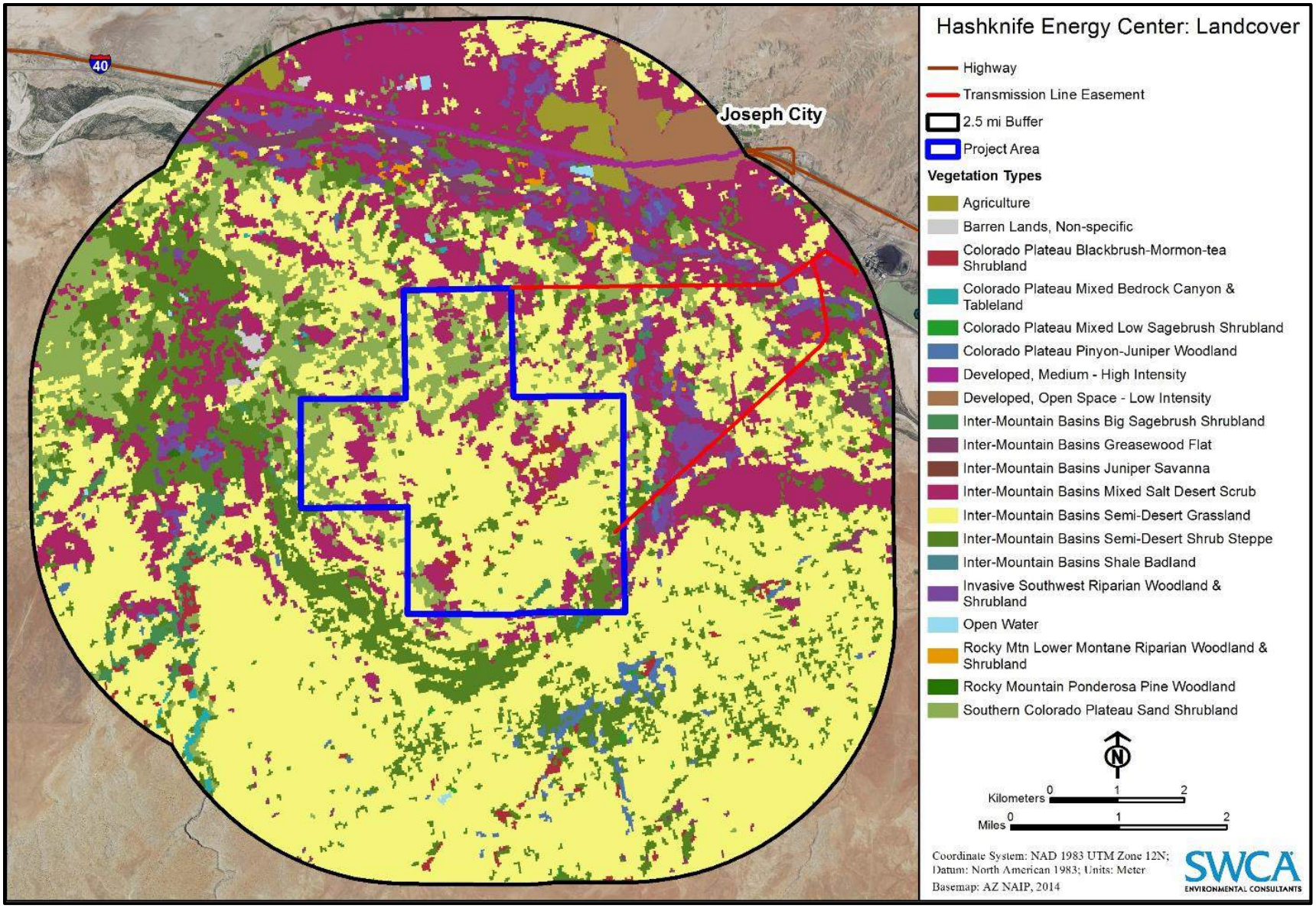

Figure 3.1. Land cover types within 2 miles of the proposed Hashknife Energy Center.

3.2 National Wetlands Inventory

A query of the USFWS NWI online tool produced three types of wetland designations within and out to a 2.5-mile buffer of the Project area (USFWS 2019b; see Appendix C). These locations are illustrated in Figure 3.2. Human-made stock tanks located within the Project area were identified by NWI as "freshwater ponds". These stock tanks are subject to local precipitation and landowner manipulation, are ephemeral, and do not support dense vegetation, trees, or fish. The Little Colorado River and several washes are classified as "riverine" habitat with intermittent flows, and adjacent uplands were designated as "freshwater forested/shrub wetland". The portion of the Project area at the river includes the existing transmission line (see Appendix D, Photo D.4) and a proposed generation tie-line, areas where no disturbance is anticipated to occur from the proposed Project.

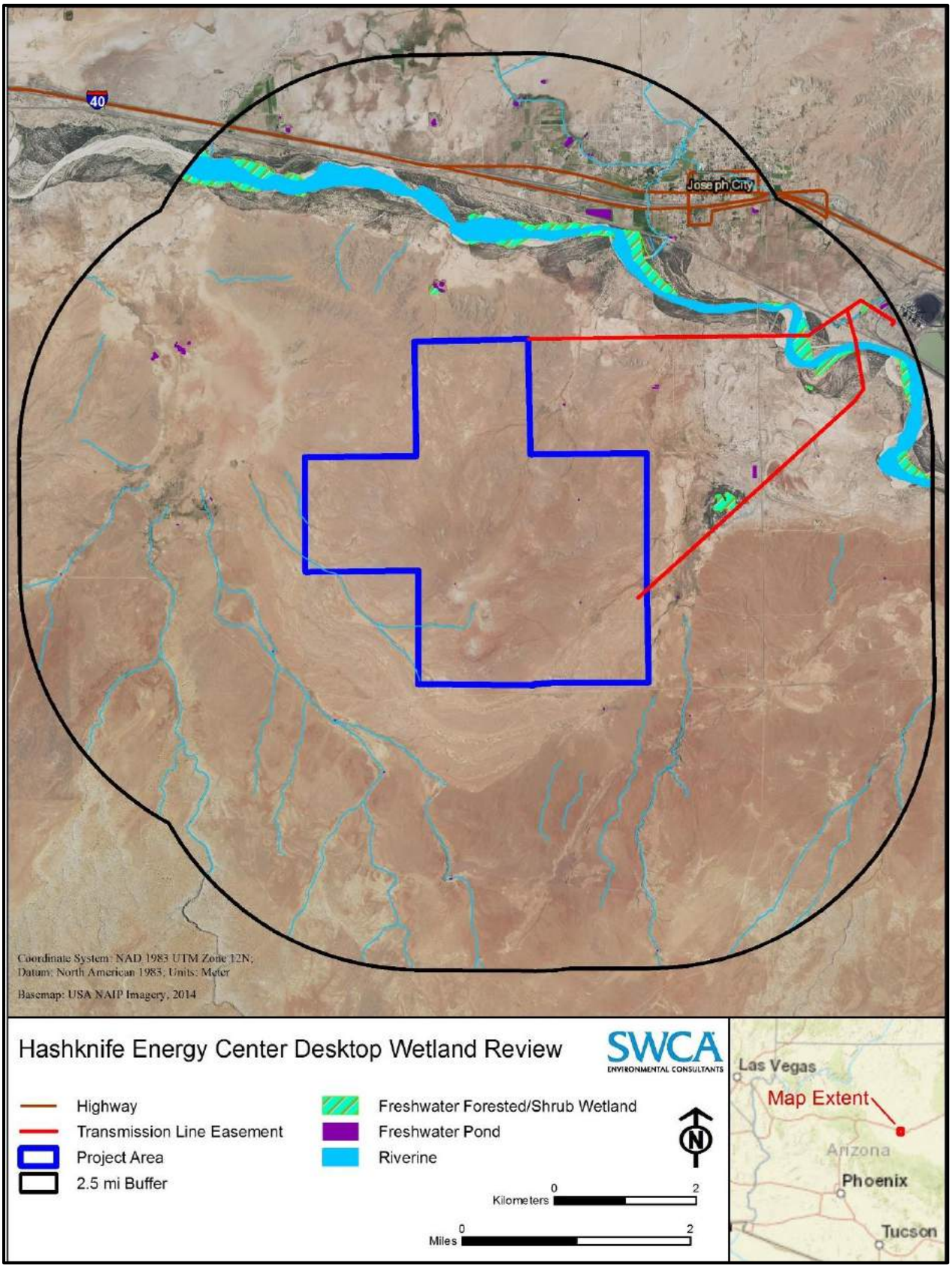

Figure 3.2. National Wetlands Inventory results for Hashknife Energy Center. Navajo County, AZ.

3.3 General Raptor Nest Survey

There were no raptor nests observed during ground reconnaissance surveys. A stand of Fremont cottonwood trees (*Populus fremontii*) and a patch of large five-stamen tamarisk (*Tamarix chinensis*) adjacent to the existing transmission line near the Little Colorado River did not contain raptor nests at the time of field reconnaissance, nor did any of the transmission line towers. No other potential raptor nesting substrate was observed.

3.4 Special-Status Wildlife Species

The USFWS and AGFD have identified 78 special-status species that have the potential to occur within and/or out to 5 miles[3] from the Project area. Of the 78 special-status species, 43 species may occur within the Project area. Table 5.1 presents the special-status species, listed by common name, scientific name, Federal/USFWS and AGFD protection status, and potential for occurrence within the Project area. The special-status species that may occur within the project area include 29 bird species, five bat species, three non-bat mammal species, one fish species, one reptile species, and four plant species. Seven of these species (two birds, two mammals, one reptile, one amphibian, and one plant) are federally listed as either Threatened or Endangered or listed as an experimental, non-essential population. These seven species are treated and discussed in Section 3.4.1 below.

3.4.1. Federally Listed Species

FEDERALLY THREATENED AND ENDANGERED SPECIES

The potential for occurrence within the Project area is low for both California condor (*Gymnogyps californianus*) and yellow-billed cuckoo (*Coccyzus americanus*). The Project area is just south of Interstate 40, which is the southern boundary of the designated non-essential experimental population 10(j) area for California condor; therefore, condors may occasionally pass through the Project vicinity. The Project area does not contain suitable nesting or roosting habitat for condors, and there are no sources of carrion present. Yellow-billed cuckoos may travel through a small section of the Project area via the Little Colorado River corridor. This area, however, does not contain suitable breeding habitat for this species.

The potential for occurrence within the Project area is unlikely for the two federally listed mammal species in Navajo County—gray wolf (*C. lupus*), and the black-footed ferret (*Mustela nigripes*). The Project area is outside of the known geographic range for both species. The black-footed is an experimental, non-essential population and the gray wolf is an experimental, non-essential population that has been proposed for delisting.

The potential for occurrence within the Project area is likely for one federally listed fish species—Little Colorado River spinedace (*Lepidomeda vittata*)—due to the proximity to the Little Colorado River.

The one federally listed reptile, northern Mexican gartersnake (*Thamnopsis eques megalops*), and the one amphibian, Chiracahua leopard frog (*Rana chiricahuensis*), are not likely to occur as the Project area is outside the known range for both species.

[3] AGFD's Enviromental Online Review Tool (AGFD 2019a) uses a 5-mile buffer around the Project area in determining the list of special-status species potentially occurring within and near proposed solar energy projects.

The one federally listed plant, Peebles Navajo cactus (*Pediocactus peeblesianus* var. *peeblesianus*), is likely to occur. The Project area contains the necessary soil type and is within the known geographic range for this species.

Eagles

Although there are no documented occurrences of eagles in the Project area, there are occurrence records for both bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) in Navajo County (eBird 2019), and both species are predicted to occur in the Project vicinity by AGFD range models (AGFD 2019b). No eagle nesting areas within the Project area or 5-mile buffer were provided by AGFD (2019a and 2019b).

Bald eagles can occur anywhere in Arizona in winter; however, large, fish-bearing waters are essential for bald eagle breeding and nesting. Most bald eagle nests in Arizona are found in the central portion of the state at elevations below 3,500 feet amsl and are within a mile of water sources providing sufficient fish and waterfowl for hunting (McCarty et al. 2018). The Project area including the 2.5-mile buffer does not contain suitable breeding or nesting habitat for this species.

Wintering habitat for bald eagles generally contains adequate food supply and open water (AGFD 2019c). Bald eagles tend to use tall trees, ridgetops, cliffs, and cliff faces for perches (AGFD 2019c). The Project area does not contain cliffs or tall trees, and the Little Colorado River is an intermittent water source providing very little open water. Bald eagles may pass through the Project area and 2.5-mile buffer occasionally in winter or during migration but are not likely to forage or breed there.

Golden eagles prefer mountainous areas for breeding, and typically nest on rock ledges, cliffs, or in large trees at elevations ranging from 4,000 to 10,000 feet amsl (AGFD 2019c). During the field reconnaissance, no suitable rock outcrops, cliffs, or large trees were observed in the Project area. Golden eagles can build nests in transmission line towers, but no nests were observed in any of the existing towers. Golden eagles hunt over a wide variety of vegetation types, including the desert scrub and grassland found within the Project area and buffer. Although there are very few occurrence records for this species in the Project vicinity, the Project area may provide foraging habitat for this species.

3.4.2. State-Listed Species

Arizona does not maintain a state list of threatened or endangered species. Instead, it maintains a list of Species of Greatest Conservation Need (SGCN) (AGFD 2012). Each species is ranked according to vulnerability criteria and placed into one of three tiers: 1A (vulnerable in at least one of 8 categories: Federal or State legal status, Extirpated from Arizona, Declining status, Disjunct status, Demographic status, Concentration status, Fragmentation status, Distribution status), 1B (vulnerable in at least one of the 8 categories as defined under 1A but matches none of the other criteria above), or 1C (unknown species status). This list includes species listed as endangered or threatened under the Endangered Species Act; however, those species are already discussed in Section 3.4.1.

Thirty-three SGCN-ranked species were identified in the output obtained from using AGFD's Online Environmental Review Tool (see Table 5.1) that are known to occur within 5 miles[4] of the Project area or are predicted to occur in the Project area based on range models. Based on range, vegetation, and other habitat features, 20 of the 34 species (10 birds, five bats, three non-bat mammals, one fish, and one reptile) may occur in the Project area (Table 5.1). None of the 20 species that may occur in the Project area were observed during the field survey, and only western burrowing owl (*Athene cunicularia*

[4] AGFD's Enviromental Online Review Tool (AGFD 2019a) uses a 5-mile buffer around the Project area in determining the list of special-status species potentially occurring within and near proposed solar energy projects.

hypugaea) is likely to occur in the Project area (personal communication, Corina Anderson, Environmental Specialist, SWCA, and J.R. DeSpain, ranch manager, Obed Ranch). The following discusses the 20 species that may occur in the project area.

The following bird species have the potential to occur in the Project area year-round because it is within their range and contains suitable habitat features or vegetation for foraging, nesting, or dispersal: western burrowing owl, golden eagle, ferruginous hawk (*Buteo regalis*), Virginia rail (*Rallus limicola*), eastern meadowlark (*Sturnella magna*), and Brewer's sparrow (*Spizella breweri*).

Some bird species may be present during migration or summer months only. These include Swainson's hawk (*Buteo swainsoni*), common nighthawk (*Chordeiles minor*), yellow warbler (*Setophaga petechia*), and sage thrasher (*Oreoscoptes montanus*) . One species—bald eagle—may be present in winter or during migration.

The Project area contains no bat roosting habitat (e.g., caves, mines, bridges, or buildings); however, three bat species may forage within the Project area year-round. These include pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), Arizona myotis (*Myotis occultus*), and spotted bat (*Euderma maculatum*). The following species are known to migrate and may forage within the Project area during spring, summer, and fall: Brazilian free-tailed bat (*Tadarida brasiliensis*) and Yuma myotis (*Myotis yumanensis*).

The following non-bat mammal species may use the Project area year-round to forage, breed, or disperse: American pronghorn (*Antilocapra americana americana*), Gunnison's prairie dog (*Cynomys gunnisoni*), and kit fox (*Vulpes macrotis*).

One fish species may occur in the Project area where it transects the Little Colorado River when there is sufficient water: Little Colorado spinedace (*Lepidomeda vittata*).

One reptile species—Pai striped whiptail (*Aspidoscelis pai*)—may use the Project area year-round to forage, breed, or disperse.

3.4.3. Birds of Conservation Concern

The Project area is located within Bird Conservation Region (BCR) 16, Southern Rockies/Colorado Plateau. The USFWS IPaC query included additional species for BCR 34, Sierra Nevada Occidental, as this BCR also occurs in southern Navajo County. All species from BCR 16 and those included by USFWS from BCR 34 were analyzed, for a total of 43 species. Of those, 22 have the potential to occur in the Project area. One Bird of Conservation Concern (BCC) species, black-throated sparrow (*Amphispiza bilineata*), was observed during the field reconnaissance. See Table 5.1 for specific habitat features or vegetation types used by each species seasonally. The following treats and discusses the 22 species that may occur in the project area.

The following BCC raptor species have the potential to hunt in the Project area or vicinity year-round: golden eagle, ferruginous hawk, peregrine falcon, and prairie falcon. As stated in Section 3.4.1, bald eagles may migrate through in spring and fall and be present in the region in the winter.

Western burrowing owl and long-eared owl (*Asio otus*) are likely or have potential to occur, respectively in the Project area year-round because it is within their range and contains suitable habitat features or vegetation for foraging, nesting, or dispersal.

The following BCC species may be present during migration to and from breeding grounds north of or in the vicinity of the Project area, although the Project area does not contain suitable breeding

habitat for these species or is outside of their known breeding range: willow flycatcher (*Empidonax trailii*), phainopepla (*Phainopepla nitens*), rufous hummingbird (*Selasphorus rufus*), lesser yellowlegs (*Tringa flavipes*), marbled godwit (*Limosa fedoa*), snowy plover (*Charadrius nivosus*), willet (*Tringa semipalmata*), black-throated gray warbler (*Dendroica nigrescens*), Brewer's sparrow (*Spizella breweri*), grasshopper sparrow (*Ammodramus savannarum*), Bendire's thrasher (*Toxostoma bendirei*), and Virginia's warbler (*Vermivora virginiae*).

The Project area may contain suitable breeding habitat for sage thrasher (*Oreoscoptes montanus*) and is located within the southern edge of the known breeding range for this species. Black-throated sparrows were observed within the Project area; the site contains suitable nesting habitat for this species and is within its breeding range.

The Project area is within the wintering or migration range of both lark bunting (*Calamospiza melanocorys*) and chestnut-collared longspur (*Calcarius ornatus*) and contains appropriate habitat for these species.

3.4.4. Breeding Bird Survey

The nearest North American Breeding Bird Survey (Castle Butte [06060]) is centered approximately 25 miles north of the Project area (USGS 2019). This Breeding Bird Survey area is about 700 feet higher in elevation and is located in the Great Basins Conifer Woodland biotic community (Brown 1994); therefore, the habitat and species observed during this bird survey are not representative of those likely to be observed in and adjacent to the Project area.

3.4.5. Christmas Bird Counts

The nearest Audubon Christmas Bird Count route (CBC 119) occurs approximately 50 miles south-southeast of the Project area and is centered about 4 miles southeast of the town of Show Low (Audubon 2019a). This route is located in pinyon-juniper and mixed conifer forest. Thus, the habitat and species observed during this bird survey are not representative of those likely to be observed in and adjacent to the Project area.

3.4.6. Important Bird Areas

There are no Audubon Important Bird Areas (IBAs) within the Project area, 2.5-mile buffer, or Project vicinity (Audubon 2019b). The nearest IBA is Mogollon Rim Snow Melt Draws, which is located approximately 40 miles southeast of the Project area. Anderson Mesa IBA is approximately 46 miles to the west.

3.4.7. Habitat Fragmentation Concern

The habitat within the 2.5-mile buffer is currently fragmented north of the Project area by Interstate 40, the BNSF Railroad, and the town of Joseph City. Land adjacent to the Project area and 2.5-mile buffer to the east, south, and west is primarily private property and used for cattle grazing. These lands remain largely undeveloped. Current land use within the Project area includes cattle ranching and grazing. The Project area is fragmented by access roads, fence lines, and corrals. Access to the site is from Obed Road, which is east of the proposed photovoltaic footprint and under the existing transmission line.

The Project area is located within Arizona Wildlife Linkage 27, Mogollon Rim-Navajo Nation (ADOT 2006; see Appendix E). This wildlife corridor links large blocks of wilderness along the Mogollon Rim to the south with wilderness found on the Navajo and Hopi Nations to the north. Although the Project

area is located within the Mogollon Rim–Navajo Nation Wildlife Linkage, this linkage covers a large geographic area (ADOT 2006). Large blocks of wildlife habitat would remain intact around the proposed Project area to accommodate terrestrial wildlife movements. Streams are often used as natural movement corridors for wildlife (AGFD 2019b).

4.0 SPECIAL-STATUS LANDS

4.1 Federal, State, and Local Lands

No proposed or designated critical habitat occurs within the Project area or within a 10-mile buffer. Federal, state, and local lands within 10 miles of the Project area are depicted in Figure 4.1.

Tribal lands within 10 miles of the Project area include:

- Hopi Nation Lands—several parcels approximately six miles west of the Project area. The management of these lands is a matter of ownership and is not geared toward conservation or recreation.

Federal lands within 10 miles of the Project area include:

- Lands administered by the Bureau of Land Management (BLM)—present as several parcels. Some are located directly west, some are north of Joseph City, and others are east of the Project area both north and south of Interstate 40. The management of these lands is a matter of ownership and is not generally geared toward conservation or recreation.

State lands within 10 miles of the Project area include:

- Arizona State Trust Lands—The Project area is on Arizona State Trust Lands, and other parcels of Arizona State Trust Lands are within 10 miles of the Project area. The management of these lands is a matter of ownership and is not geared toward conservation or recreation.
- One parcel owned by AGFD adjacent to the Little Colorado River.

Joseph City-administered lands within 10 miles of the Project area include:

- Nineteen parcels primarily used for schools and utilities.
- One parcel held for the Joseph City Cemetery.

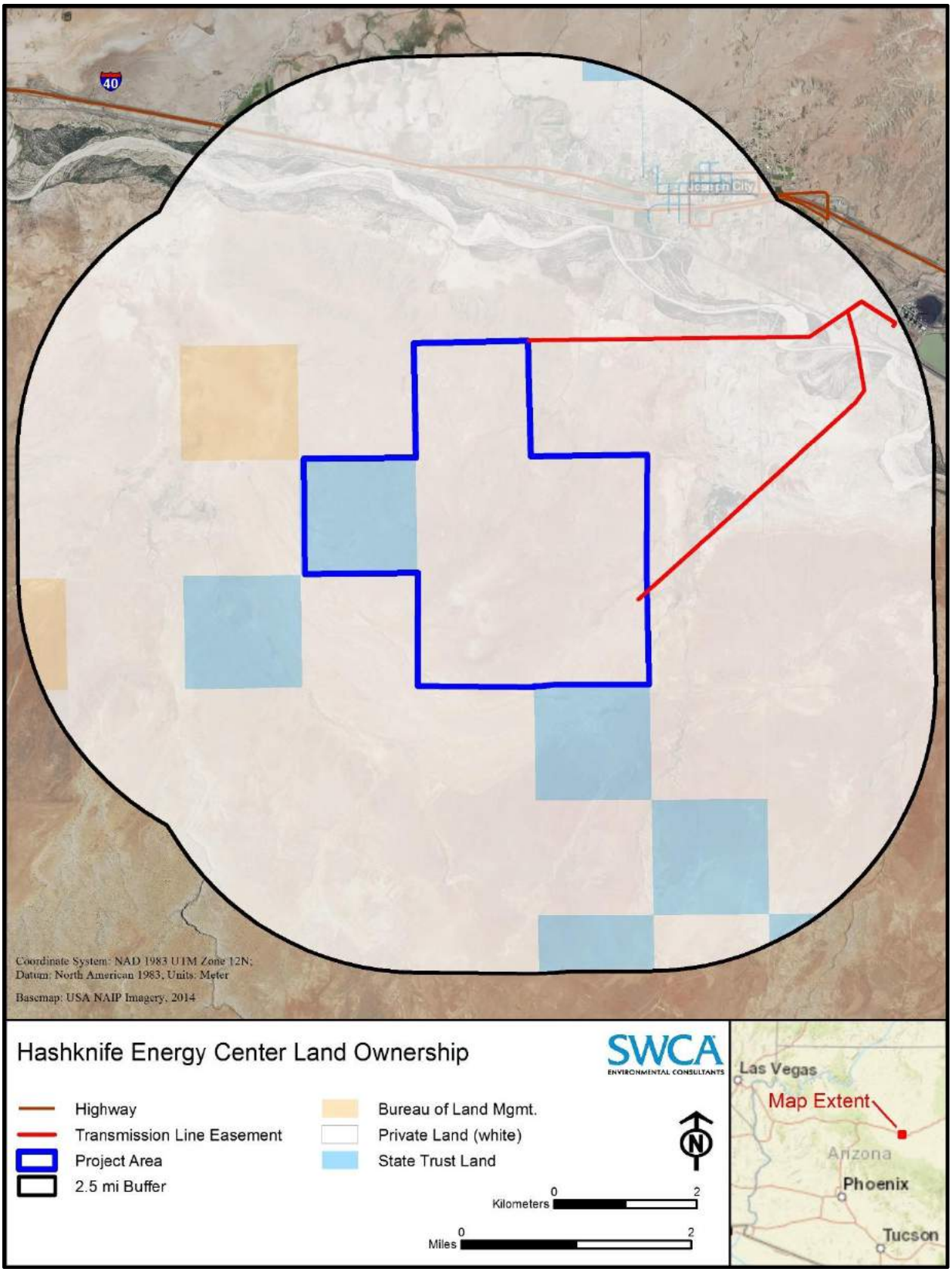

Figure 4.1. Federal, state, and local lands within 10 miles of the Hashknife Energy Center. Navajo County, AZ.

5.0 PLANT COMMUNITIES OF CONCERN

Peebles Navajo cactus—a federally endangered plant species—is likely to occur in the Project area, although none were observed during field reconnaissance. The species prefers weakly alkaline, gravelly soils where the host gravel can occur on a variety of substrates, including but not limited to the Shinarump conglomerate of the Chinle Formation. This soil type is present within the Project area. This species is also an Arizona Department of Agriculture (ADA) protected plant designated as highly safeguarded and has been documented within 5 miles of the Project area (AGFD 2019b). Three ADA plant species designated as salvage restricted have also been documented within 5 miles of the Project area (AGFD 2019b). These include gladiator milkvetch (*Astragulus xiphoides*), roundleaf errazuizia (*Errazurizia rotundata*), and Whipple's fishhook cactus (*Sclerocactus whipplei*). These three species were not observed during the field survey but may occur due to the proximity of documented observations and the presence of suitable habitat within the Project area.

Table 5.1. Wildlife and Plant Species of Concern That Are Known or Likely to Occur in the Hashknife Solar Energy Facility Project Area

Wildlife Type / Common Name	Scientific Name	Status[1]	Habitat by Season	Seasons of Potential Occurrence and Likelihood of Occurrence in the Project Area[2]			
				Spring	Summer	Fall	Winter
AMPHIBIANS							
Anurans							
Arizona toad	*Anaxyrus microscaphus*	SGCN 1B	Found year-round in areas of shallow, flowing, permanent water over sandy or rocky substrates, typically in river canyons or foothill streams below 8,000 feet amsl.	N	N	N	N
Chiricahua leopard frog	*Rana chiricahuensis*	T	Found year-round in permanent or semi-permanent springs, livestock tanks, and streams in the upper portions of watersheds at elevations between 3,000 and 9,000 feet amsl throughout the year.	N	N	N	N
BIRDS							
Raptors							
American peregrine falcon	*Falco peregrinus*	BCC	Breeds in open areas with cliffs; occurs year-round in Arizona within landscapes having cliffs and rivers; nearly any open habitat; mudflats, lake edges, and mountain chains.	L	L	L	L
Bald eagle	*Haliaeetus leucocephalus*	BGEPA, BCC, SGCN 1A	Prefers mature trees and snags near water for breeding in winter/spring; forages in a variety of habitats, including dry areas in summer/fall/winter; found anywhere in Arizona during winter.	L	N	L	L
Common black-hawk	*Buteogallus anthracinus*	BCC	Found year-round; riparian obligate, nests primarily along perrenial drainages with mature broadleaf deciduous trees.	N	N	N	N
Ferruginous hawk	*Buteo regalis*	BCC, SGCN 1B	Occurs in northern Arizona year-round, although uncommon. Prefers to forage in open environments including grasslands or desert.	L	L	L	L

Wildlife Type / Common Name	Scientific Name	Status[1]	Habitat by Season	Seasons of Potential Occurrence and Likelihood of Occurrence in the Project Area[2]			
				Spring	Summer	Fall	Winter
Golden eagle	*Aquila chrysaetos*	BGEPA, BCC, SGCN 1B	Prefers mountainous areas for breeding; found foraging in grasslands, shrub steppe, deserts, and other open areas of the West; found year-round in Arizona, vacates hot deserts in the summer.	M	M	M	M
Prairie falcon	*Falco mexicanus*	BCC	Occurs in northern Arizona year-round in grasslands, shrub steppe, deserts, and other open areas of the West up to about 10,000 feet in elevation.	M	M	M	M
Swainson's hawk	*Buteo swainsoni*	SGCN 1C	Breeds in grassland in northern Arizona in summer. Winters in Central and South America.	L	L	L	N
Bitterns							
American bittern	*Botaurus lentiguinosus*	BCC	Winters in southern Arizona and uses water bodies and brackish marshes. Breeds mainly in freshwater marshes containing tall vegetation.	N	N	N	N
Buntings							
Lark bunting	*Calamospiza melanocorys*	BCC	This species is endemic to grasslands and shrub steppe. Only winters and migrates through in Arizona using a variety of open habitats.	L	N	L	L
Cuckoos							
Yellow-billed cuckoo	*Coccyzus americanus*	T, BCC	Winters in South America. During spring through early fall, breeds typically in riparian woodland vegetation (cottonwood [*Populus* spp.], willow [*Salix* spp.], or saltcedar [*Tamarix* spp.]) at elevations below 6,600 feet. Dense understory foliage appears to be an important factor in nest site selection.	N	L	L	N

Wildlife Type / Common Name	Scientific Name	Status[1]	Habitat by Season	Seasons of Potential Occurrence and Likelihood of Occurrence in the Project Area[2]			
				Spring	Summer	Fall	Winter
Finches							
Black rosy-finch	*Leucosticte atrata*	BCC	Found in mountainous areas (alpine tundra and high open parks and valleys), thinly vegetated lowlands, and high deserts of shadscale (*Atriplex confertifolia*), greasewood (*Sarcobatus vermiculatus*), sagebrush, rabbitbrush, and open pinyon (*Pinus* spp.)-juniper (*Juniperus* spp.). Winter movements dependent on snow depth and weather conditions. May occasionally winter in north-central extreme of Arizona near Flagstaff.	N	N	N	N
Brown-capped rosy-finch	*Leucosticte australis*	BCC	Vagrant in Arizona. Occurs in open areas including alpine tundra, high parks, meadows, and open grasslands/shrublands. Non-breeding range outside of Arizona includes southern Wyoming through Colorado and north-central New Mexico.	N	N	N	N
Cassin's finch	*Haemorhous cassinii*	BCC	Inhabits coniferous forest over broad elevational range including ponderosa pine (*Pinus ponderosa*) and pinyon pine associations. Non-breeding range includes central, east-central, and southeastern portions of Arizona; year-round range includes north-central and northeastern portions of Arizona.	N	N	N	N
Flycatchers							
Gray flycatcher	*Empidonax wrightii*	SGCN 1C	Found in sagebrush, pinyon-juniper, or open ponderosa pine forests in northern Arizona in the summer; winters in southeastern Arizona	N	N	N	N
Olive-sided flycatcher	*Contopus cooperi*	BCC	Breeds in montane coniferous forests and at forest edges. Winters in portions of Central and South Americas.	N	N	N	N
Phainopepla	*Phainopepla nitens*	BCC	Breeds in desert, riparian woodland, and chaparral habitats.	N	L	N	N

Wildlife Type / Common Name	Scientific Name	Status[1]	Habitat by Season	Seasons of Potential Occurrence and Likelihood of Occurrence in the Project Area[2]			
				Spring	Summer	Fall	Winter
Willow flycatcher	*Empidonax trailii*	BCC	Breeds in areas with willows or other shrubs near standing or running water. Winters in portions of Central America.	M	N	M	N
Grebes							
Clark's grebe	*Aechmophorus clarkii*	BCC	Nests on large freshwater lakes and marshes with edges having emergent vegetation such as reeds (*Phragmites* spp.). Winters in saltwater or brackish habitats, with a few numbers wintering inland on lakes and rivers.	N	N	N	N
Grouse							
Gunnison sage grouse	*Centrocercus minimus*	BCC	Found year-round in sagebrush steppe at elevations of 7,000 feet or higher within very limited range.	N	N	N	N
Hummingbirds							
Rufous hummingbird	*Selasphorus rufus*	BCC	Migrates through Arizona in late summer, may overwinter in extreme southwestern Arizona.	L	M	H	N
Jays							
Pinyon jay	*Gymnorhinus cyanocephalus*	BCC, SGCN 1B	Inhabits pinyon-juniper woodland; also found in sagebrush, scrub oak (*Quercus* spp.), and chaparral. Year-round range includes northern half of Arizona.	N	N	N	N
Longspurs							
Chestnut-collared longspur	*Calcarius ornatus*	BCC	Winters in low-grass desert grasslands with isolated water sources. Associated with prairie dog colonies. Non-breeding range includes eastern half of Arizona.	N	N	N	L

Wildlife Type / Common Name	Scientific Name	Status[1]	Habitat by Season	Seasons of Potential Occurrence and Likelihood of Occurrence in the Project Area[2]			
				Spring	Summer	Fall	Winter
Meadowlarks							
Eastern meadowlark	*Sturnella magna*	SGCN 1C	Found year-round in portions of Arizona. Most common in native grasslands and prairies, but also occurs in pastures, hayfields, agricultural fields, airports, and other grassy areas.	M	M	M	M
Nighthawks							
Common nighthawk	*Chordeiles minor*	SGCN 1B	This species winters in South America and breeds in northern and eastern Arizona. Found in a variety of open habitats including sagebrush and desert grassland, prairies and plains, open forests, croplands, rock outcrops, and gravel rooftops.	N	H	N	N
Owls							
Burrowing owl, western burrowing owl	*Athene cunicularia hypugaea*	BCC, SGCN 1B	Found year-round of portions of Arizona. Occurs in open areas, areas with mammal burrows, and areas that have been cleared for human use. Considered migratory in northern Arizona.	H	H	H	L
Flammulated owl	*Psiloscops flammeolus*	BCC	Inhabits open, mature ponderosa pine or other forest (e.g., dry montane conifer, aspen [*Populus tremuloides*]) with similar features often with oak, dense saplings, or other brushy understory. Breeding range includes central to east-central Arizona and fragmented locations of southeastern and northwestern portions of the state.	N	N	N	N
Long-eared owl	*Asio otus*	BCC	Found year-round throughout most of Arizona. Roosts in dense vegetation, forages in open grasslands or shrublands. Known to nest in willows, cottonwoods, and junipers adjacent to shrub steppe.	L	L	L	L

Wildlife Type / Common Name	Scientific Name	Status[1]	Habitat by Season	Seasons of Potential Occurrence and Likelihood of Occurrence in the Project Area[2]			
				Spring	Summer	Fall	Winter
Quail							
Scaled quail	*Callipepla squamata*	SGCN 1C	Live year-round in desert grasslands and shrublands including open plains, hills, mesas, sagebrush, and pinyon-juniper woodlands up to about 7,000 feet in elevation.	N	N	N	N
Shorebirds							
Lesser yellowlegs	*Tringa flavipes*	BCC	Migrates through Arizona. Breeds in open boreal forest with scattered shallow wetlands. Winters in wide variety of shallow, fresh, and saltwater habitats.	L	L	L	N
Long-billed curlew	*Numenius americansus*	BCC	Migrates through Arizona. This species breeds on plains and prairies, and uses lakes, rivers, and mudflats when migrating to wetlands, estuaries, mudflats on the coasts and interior of Mexico.	N	N	N	N
Marbled godwit	*Limosa fedoa*	BCC	Vagrant in Arizona. Breeds in shortgrass prairies near wetlands. In winter, forage and rest along coastal mudflats, estuaries, and sandy beaches.	L	N	L	N
Mountain plover	*Charadrius montanus*	BCC	Breeds on open prairie, is often associated with prairie dog colonies. Winters in southern Arizona where it most commonly occurs in cultivated fields away from water.	N	N	N	N
Snowy plover	*Charadrius nivosus*	BCC	Inland habitats include wastewater and salt-evaporation ponds, alkaline and saline lakes, reservoirs, and riverine sand bars. Migrates throughout Arizona except eastern edge of the state. Isolated breeding locations in southern portion of the state.	L	N	L	N
Virginia rail	*Rallus limicola*	SGCN 1C	Breeds in shallow freshwater wetlands with tall stands of cattails (*Typha* spp.) and rushes (Family Juncaceae). They are most common in wetlands with 40–70% coverage of tall emergent vegetation, mixed with open water, mudflats, and areas with matted vegetation. Some are year-round residents in the southern portion of their range.	L	L	L	L

Wildlife Type / Common Name	Scientific Name	Status[1]	Habitat by Season	Seasons of Potential Occurrence and Likelihood of Occurrence in the Project Area[2]			
				Spring	Summer	Fall	Winter
Willet	*Tringa semipalmata*	BCC	Migrates through Arizona. Inhabits open beaches, bay shores, marshes, mudflats, and rocky coastal zones.	L	L	L	N
Sparrows							
Black-chinned sparrow	*Spizella atrogularis*	BCC	Winters in southern Arizona. Found in dry brushlands and chaparral from near sea level to 8,000 feet. They associate with sagebrush, rabbitbrush, ceanothus (*Ceanothus* spp.), and other chaparral species. Typically breeds on rocky hillsides and winter downslope in desert scrub.	N	N	N	N
Black-throated sparrow	*Amphispiza bilineata*	BCC	Breeding and year-round resident throughout much of Arizona. Found in semi-open areas with evenly spaced shrubs and trees. Common in canyons, desert washes, and desertscrub.	H	H	H	N
Brewer's sparrow	*Spizella breweri*	BCC, SGCN 1C	Breeding, wintering, and year-round resident throughout much of Arizona. Breeds in open sagebrush habitats. Winters in sagebrush or desertscrub habitats containing saltbush and creosote (*Larrea tridentata*); mostly treeless areas.	H	L	H	N
Grasshopper sparrow	*Ammodramus savannarum*	BCC	Found in moderately open grasslands with patchy bare ground; grasslands may contain shrub cover. Non-breeding range includes southern extreme of Arizona; year-round range includes south-central portion of the state.	N	N	L	N
Rufous-winged sparrow	*Aimophila carpalis*	BCC	Found year-round in Arizona in thorn scrub and arid grasslands.	N	N	N	N
Thrashers							
Bendire's thrasher	*Toxostoma bendirei*	BCC	Prefers desert habitats, grassland, shrubland, or woodland from sea level to approximately 6,000 feet. Breeding range includes northern two-thirds of Arizona; year-round range includes southern third of the state.	L	L	L	N

Wildlife Type / Common Name	Scientific Name	Status[1]	Habitat by Season	Seasons of Potential Occurrence and Likelihood of Occurrence in the Project Area[2]			
				Spring	Summer	Fall	Winter
Sage thrasher	*Oreoscoptes montanus*	SGCN 1C	Breeding, wintering, and year-round resident throughout all of Arizona. Winters in Arizona in grasslands with scattered shrubs and open pinyon-juniper woodlands. Breeds exclusively in shrub steppe habitats dominated by sagebrush species.	L	M	L	N
Thrushes							
Veery	*Catharus fuscescens*	BCC	Found in damp, deciduous forests. Has a strong association with riparian and disturbed forest with dense understory. Migrates through Arizona; breeding range includes outlier population on east-central border of Arizona.	N	N	N	N
Titmice							
Juniper titmouse	*Baeolophus ridgwayi*	BCC, SGCN 1C	Found year-round in Arizona in pinyon-juniper woodlands; may be mixed with deciduous or evergreen oaks.	N	N	N	N
Vireos							
Gray vireo	*Vireo vicinior*	BCC, SGCN 1C	Found in mixed pinyon-juniper and oak scrub associations and/or chaparral. Breeding range includes northern, central, and eastern Arizona; non-breeding range includes south-central portion of the state.	N	N	N	N
Vultures							
California condor	*Gymnogyps californianus*	E, EXPN	Year-round resident in northwestern/northern Arizona. Nests in a variety of rock formations, including caves crevices, and potholes in isolated scrubby chaparral and forested montane regions. Presence of adequate food supplies in open, accessible areas with reliable air movements is an important habitat attribute; foraging occurs over long distances in these open habitats.	L	L	L	L

Wildlife Type / Common Name	Scientific Name	Status[1]	Habitat by Season	Seasons of Potential Occurrence and Likelihood of Occurrence in the Project Area[2]			
				Spring	Summer	Fall	Winter
Warblers							
Black-throated gray warbler	*Dendroica nigrescens*	BCC	Breeds throughout much of Arizona in open pine forests, pine-oak woodlands, and pinyon-juniper forests with a brushy understory. During migration and on the wintering grounds they use similar habitats in addition to woodlands, scrub, and thickets.	L	L	L	N
Grace's warbler	*Setophaga graciae*	BCC	Inhabits pine, pine-oak, and spruce-fir forest. Breeds throughout Arizona except for southwestern portion of state.	N	N	N	N
Red-faced warbler	*Cardellina rubrifrons*	BCC	Breeds in high elevation fir, pine, and pine-oak forests. Winters in Mexico and Central America.	N	N	N	N
Virginia's warbler	*Vermivora virginiae*	BCC	Breeds in open pinyon-juniper and oak woodlands, often on steep slopes with shrubby ravines. Winters in Mexico.	L	L	L	N
Yellow warbler	*Setophaga petechia*	SGCN 1B	Occupies wet, deciduous thickets, especially those dominated by willows, and disturbed and early successional habitats. Migration habitat includes scrub/shrub and semi-open, second-growth forest, often associated with wetlands. Migrates through most of Arizona. Breeds in central, east-central, and south-central portions of the state; breeding (scarce) range includes northern portion of the state.	M	L	L	N
Whip-poor-wills							
Mexican whip-poor-will	*Antrostomus arizonae*	BCC	Breeds in southeastern Arizona in dry deciduous or evergreen-deciduous forest with little or no underbrush close to open areas. Winters throughout portions of Mexico.	N	N	N	N

Wildlife Type / Common Name	Scientific Name	Status[1]	Habitat by Season	Seasons of Potential Occurrence and Likelihood of Occurrence in the Project Area[2]			
				Spring	Summer	Fall	Winter
Woodpeckers							
Lewis's woodpecker	*Melanerpes lewis*	BCC	Found in ponderosa pine and open riparian forests with brushy understory and dead or downed woody material; may also use oak, pinyon-juniper, and pine-fir woodlands, and nut and fruit orchards. Year-round range includes northern portion of Arizona. Non-breeding range includes northwestern, central, and southeastern portions of the state.	N	N	N	N
Wrens							
Pacific wren	*Troglodytes pacificus*	SGCN 1B	Occupies a wide range of habitats including deciduous and coniferous riparian forests, hardwood forests, and mixed-conifer hardwood forests. Breeding range includes the Mogollon Rim of Arizona; winters along portions of the lower Colorado River.	N	N	N	N
MAMMALS							
Bats							
Arizona myotis	*Myotis occultus*	SGCN 1B	Day roosts and maternity colonies in tree cavities and crevices; maternity colonies also in buildings and bridges; winter roost records from mines. Riparian areas and in ponderosa pine and oak-pine woodland near water below 8,600 feet. Also found along permanent water. In Arizona range includes central band from east to west and north-central portions of the state.	M	M	M	M
Brazilian free-tailed bat	*Tadarida brasiliensis*	SGCN 1B	Found in a wide variety of habitats from desert communities through pinyon-juniper woodlands and pine-oak forests at elevations up to approximately 9,000 feet. Maternity colonies and roosts found in limestone caves, abandoned mines, bridges, buildings, and hollow trees. Range throughout Arizona.	M	M	M	N

Wildlife Type / Common Name	Scientific Name	Status[1]	Habitat by Season	Seasons of Potential Occurrence and Likelihood of Occurrence in the Project Area[2]			
				Spring	Summer	Fall	Winter
Pale Townsend's big-eared bat	*Corynorhinus townsendii pallescens*	SGCN 1B	Day roosts and maternity and hibernation colonies in caves, mines, or buildings. Night roosts may include caves, buildings, and tree cavities. Associated with mesic forested habitats but occupies a broad range of habitats including arid scrub, pine forest, pinyon-juniper, and wooded canyons between 500 and 8,400 feet in elevation. Range throughout Arizona.	L	L	L	L
Spotted bat	*Euderma maculatum*	SGCN 1B	Roosts in crevices and cracks of cliff faces; sometimes roosts in caves or in buildings near cliffs. Variety of habitats including low to high deserts, riparian areas, ponderosa, and spruce-fir forests below 10,600 feet in elevation. Range throughout Arizona.	L	L	L	L
Western red bat	*Lasiurus blossevillii*	SGCN 1B	Roosts in trees, particularly cottonwoods. Associated with broad-leaf deciduous riparian forests and woodlands from 1,900 to 7,200 feet in elevation. In Arizona, range includes northwestern through southeastern portions of the state.	N	N	N	N
Yuma myotis	*Myotis yumanensis*	SGCN 1B	In spring through fall, found in desertscrub, riparian, woodlands, and forests; however, this species is closely associated with water and cliff faces. Roosts in caves, mines, cliff crevices, buildings, and bridges. This species typically overwinters in Mexico.	L	L	L	N
Non-bat Mammals							
American beaver	*Castor canadensis*	SGCN 1B	Inhabits permanent water sources. Prefers low-gradient streams, ponds, and small-bottomed lakes with dammable outlets. Found throughout Arizona except south-central portion of the state.	N	N	N	N
American pronghorn	*Antilocapra americana americana*	SGCN 1B	Found in grasslands, sagebrush plains, deserts, and foothills. In Arizona, scattered populations throughout the state. Range includes narrow band from east-central through north-central and northwestern portions of the state.	M	M	M	M
Black-footed ferret	*Mustela nigripes*	E, EXPN, SGCN 1A	Found in grassland plains on mountain basins in association with prairie dogs (*Cynomys* spp.).	N	N	N	N

Wildlife Type / Common Name	Scientific Name	Status[1]	Habitat by Season	Seasons of Potential Occurrence and Likelihood of Occurrence in the Project Area[2]			
				Spring	Summer	Fall	Winter
Gray wolf	*Canis lupus*	E, EXPN, PD	Occupies a wide range of habitats including temperate forests, mountains, tundra, taiga, and grasslands.	N	N	N	N
Gunnison's prairie dog	*Cynomys gunnisoni*	SGCN 1B	Colonizes gently sloping grasslands and semi-desert and montane shrublands at elevations between 4,600 and 12,000 feet. In Arizona, range includes central and northeastern portions of the state.	L	L	L	L
Kit fox	*Vulpes macrotis*	SGCN 1B	Occurs in open desert, shrubby, or shrub-grass habitat. Found year-round, pups den from February to April.	H	H	H	H
Springerville pocket mouse	*Perognathus flavus goodpasteri*	SGCN 1B	Found year-round in plains-like short grasslands interspersed with volcanic rock or other sparsely vegetated grasslands at elevations from 5,200 to 7,000 feet.	N	N	N	N
Stephen's woodrat	*Neotoma stephensi*	SGCN 1B	Inhabits rocky areas in pinyon-juniper woodlands year-round.	N	N	N	N
FISHES							
Little Colorado spinedace	*Lepidomeda vittata*	T, SGCN 1A	Found in pools with water flowing over fine gravel and silt-mud substrates of medium to small streams. Four populations exist in Arizona: mainstem of the Little Colorado River, Nutrioso Creek, Clear Creek, and Chevelon Creek. Known or believed to occur in Navajo County.	M	M	M	M
REPTILES							
Lizards							
Pai striped whiptail	*Aspidoscelis pai*	SGCN 1B	Inhabits grasslands, chaparral, conifer woodlands, and ponderosa pine parklands at elevations from approximately 4,500 to 7,600 feet. Populations scattered across the Colorado Plateau of northern Arizona and in the Mazatzal Mountains of central Arizona.	M	M	M	M

Wildlife Type / Common Name	Scientific Name	Status[1]	Habitat by Season	Seasons of Potential Occurrence and Likelihood of Occurrence in the Project Area[2]			
				Spring	Summer	Fall	Winter
Snakes							
Northern Mexican gartersnake	*Thamnophis eques megalops*	T	Riparian obligate. Lotic and lentic habitats include cienegas and stock tanks (earthen impoundments), and rivers containing pools and backwaters. Most frequently found between 3,000 and 5,000 feet but may occur up to approximately 8,500 feet in elevation. Uses adjacent terrestrial habitats for foraging, thermoregulation, gestation, shelter, immigration, emigration, and brumation.	N	N	N	N
INVERTEBRATES							
California floater	*Anodonta californiensis*	SGCN 1A	Inhabits shallow areas of unpolluted lakes, reservoirs, and perennial streams with relatively stable water levels of low velocity flow regime from 4,000 to 8,700 feet. In Arizona, found in east-central portion of the state.	N	N	N	N
PLANTS							
Gladiator milkvetch	*Astragalus xiphoides*	SR	Found on high sandstone mesas and clay bluffs from 4,900 to 6,000 feet in elevation.	M	M	M	M
Peebles Navajo cactus	*Pediocactus peeblesianus* var. *peeblesianus*	E, HS	Prefers weakly alkaline, gravelly soils where the host gravel can occur on a variety of substrates, including but not limited to the Shinarump conglomerate of the Chinle Formation. Most of the gravels that host this cactus are remnants of bars or terraces of Little Colorado paleochannel gravels. Typically occurs at elevations between 5,400 and 5,600 feet.	H	H	H	H
Roundleaf errazurizia	*Roundleaf errazurizia*	SR	Found on red or white sandstone pavement and ledges, in sandy crevices among rocks, or in loose, drifted sand. Occurs in Navajo County from 4,500 to 5,100 feet in elevation.	M	M	M	M

Wildlife Type / Common Name	Scientific Name	Status[1]	Habitat by Season	Seasons of Potential Occurrence and Likelihood of Occurrence in the Project Area[2]			
				Spring	Summer	Fall	Winter
Whipple's fishhook cactus	*Sclerocactus whipplei*	SR	Inhabits gravelly and sandy hills, canyon rims and mesas in juniper, desert grassland, salt desertscrub and blackbrush (*Coleogyne ramosissima*) communities at elevations ranging from 5000 to 6000 feet.	M	M	M	M

Sources: AGFD (2019b); Brennan and Holycross (2006); Corman and Wise-Gervais (2005); Cornell Lab of Ornithology (2019); eBird (2019); NatureServe (2019); Reid (2006); Udvardy (1997); USFWS (2019c).

[1] Status:

Federal (USFWS) designations: BCC = USFWS Bird of Conservation Concern for Bird Conservation Region; BGEPA = Bald and Golden Eagle Protection Act (federal); CCA = Candidate Conservation Agreement (formal, voluntary agreement between USFWS and one or more parties to address the conservation needs of candidate or potential candidate species); E = Endangered; T = Threatened; EXPN = Experimental, Nonessential population; PD = Proposed for Delisting.

State designations: SGCN = Species of Greatest Conservation Need, as defined in the Arizona State Wildlife Action Plan (AGFD 2012); SR = Salvage Restricted; HS = Highly Safeguarded

1A: Scored "1" for Vulnerability in at least one of 8 categories (Federal or State legal status, Extirpated from Arizona, Declining status, Disjunct status, Demographic status, Concentration status, Fragmentation status, Distribution status), or matches at least one of the following:

- Federally listed as Endangered or Threatened under the Endangered Species Act
- Federally listed as Candidate species
- Is specifically covered under a signed conservation agreement (CCA)
- Federally protected under the BGEPA
- Requires post-delisting monitoring
- Is petitioned for listing

1B: Scored "1" for Vulnerability in at least one of the 8 categories as defined under 1a but matches none of the other criteria above

1C: Unknown status species.

[2] Potential Occurrence: Used to indicate potential of species to occur within the Project area during each season: H=High potential to occur; M=Moderate potential to occur; L=Low potential to occur; N=No potential to occur.

6.0 LITERATURE CITED

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APPENDIX A

Data Requests – Arizona Game and Fish Department

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:
Hashknife Energy Center

User Project Number:
60208

Project Description:
Hashknife Energy Center

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

Contact Person:
Tom Koronkiewicz

Organization:
SWCA

On Behalf Of:
CONSULTING

Project ID:
HGIS-11535

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.

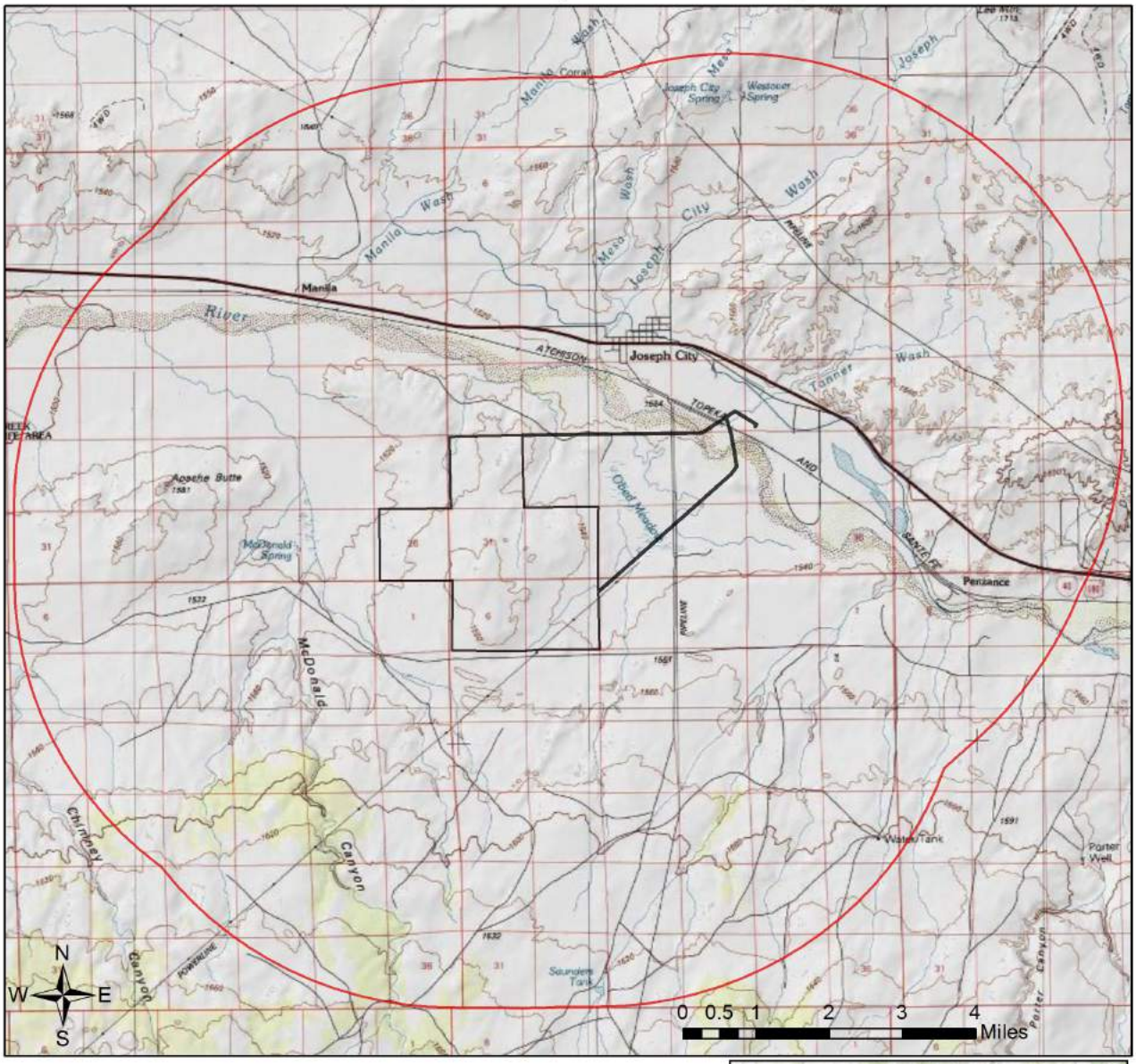
Locations Accuracy Disclaimer:
Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Report is solely responsible for the project location and thus the correctness of the Project Review Report content.

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

Hashknife Energy Center

USA Topo Basemap With Locator Map



Project Boundary

Buffered Project Boundary

Project Size (acres): 3,926.36

Lat/Long (DD): 34.9136 / -110.3640

County(s): Navajo

AGFD Region(s): Pinetop

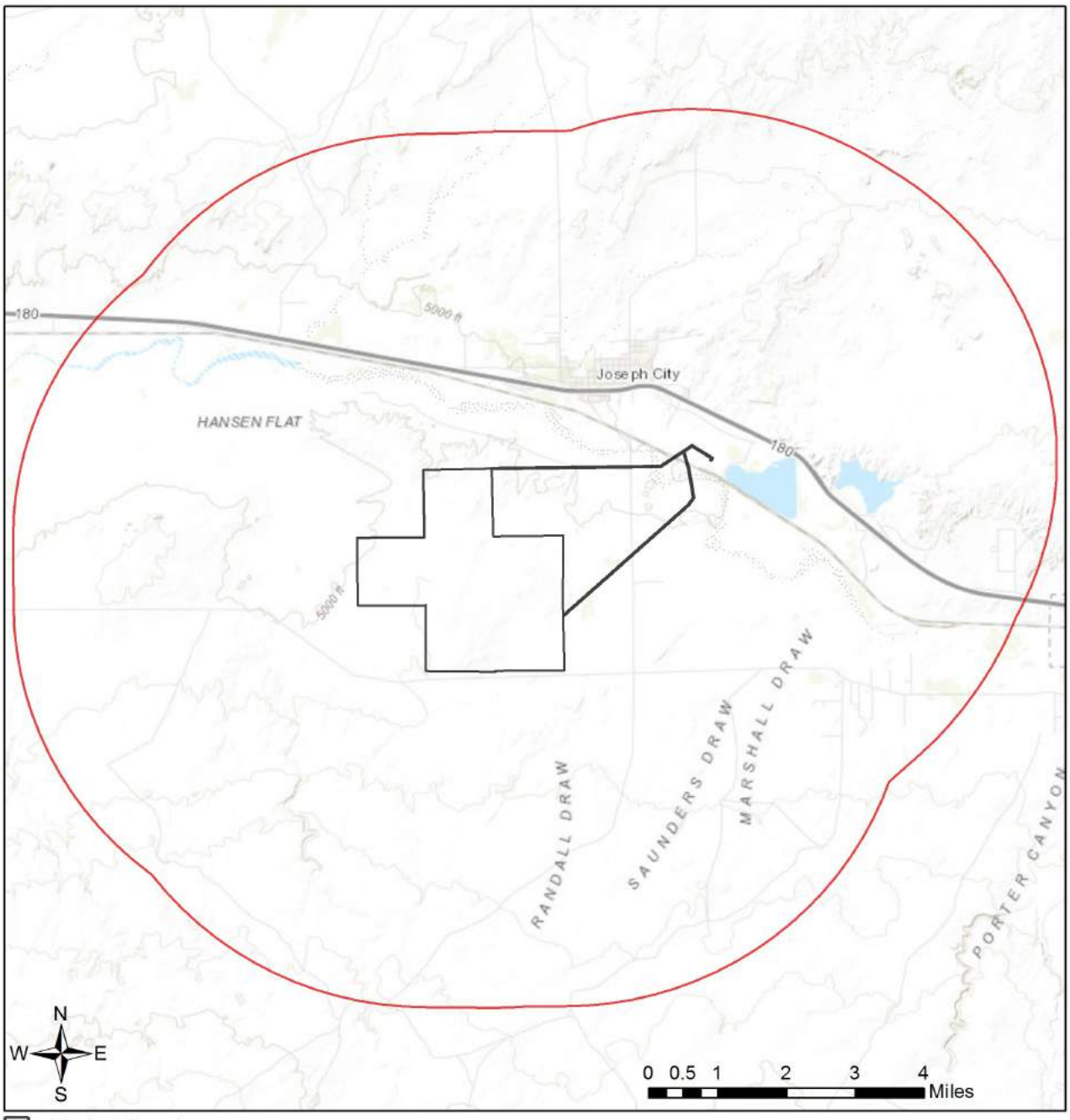
Township/Range(s): T17N, R18E; T17N, R19E; T18N, R18E +

USGS Quad(s): APACHE BUTTE; JOSEPH CITY

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

Hashknife Energy Center

Web Map As Submitted By User



Project Boundary

Buffered Project Boundary

Project Size (acres): 3,926.36

Lat/Long (DD): 34.9136 / -110.3640

County(s): Navajo

AGFD Region(s): Pinetop

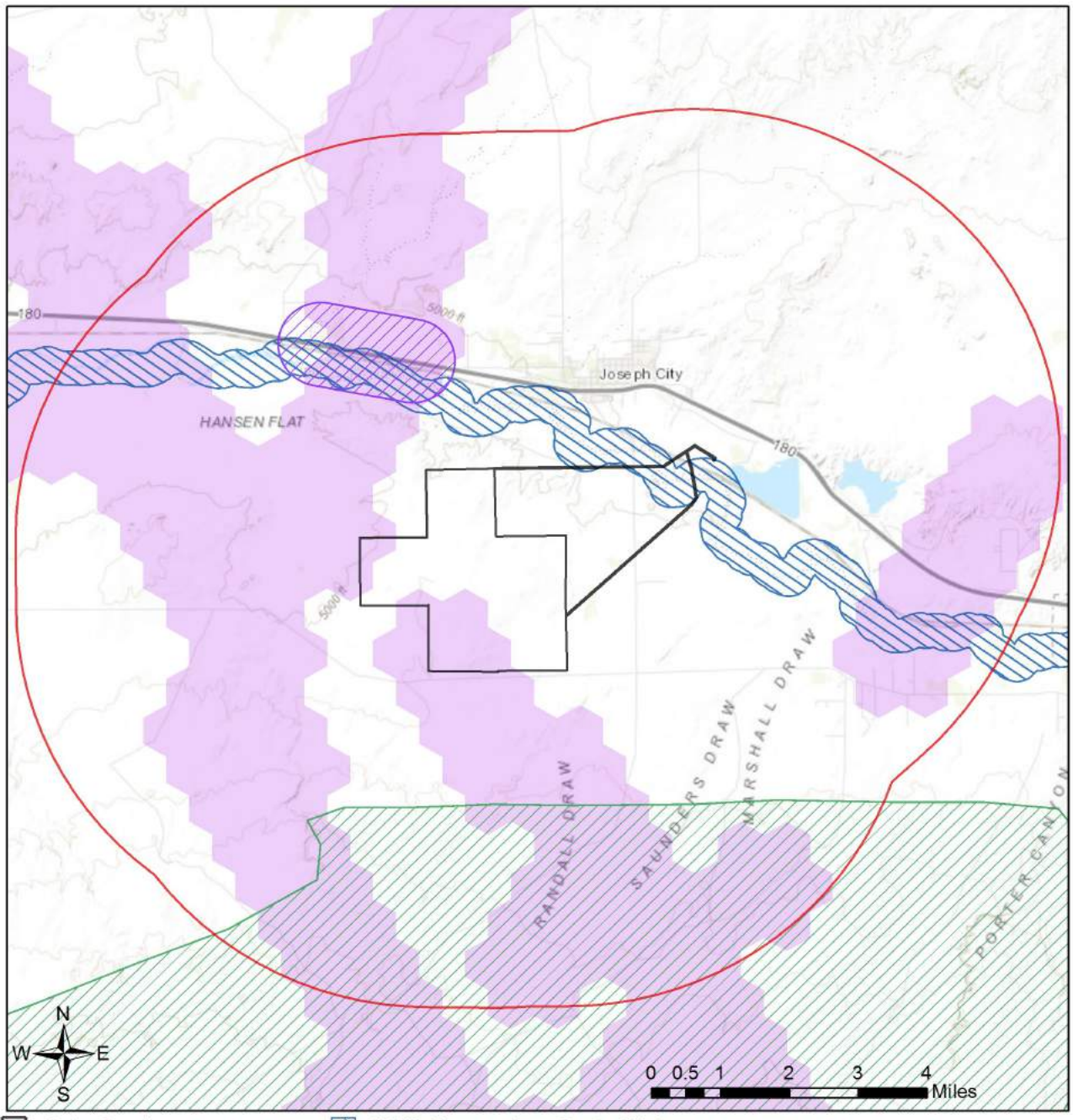
Township/Range(s): T17N, R18E; T17N, R19E; T18N, R18

USGS Quad(s): APACHE BUTTE; JOSEPH CITY

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

Hashknife Energy Center

Important Areas



- Project Boundary
- Buffered Project Boundary

County Stakeholder Assessment

- Wildlife Crossing Area
- Wildlife Movement Area - Diffuse
- Wildlife Movement Area - Landscape
- Wildlife Movement Area - Riparian/Wash
- Wildlife Connectivity
- Important Connectivity Zones
- Pinal County Riparian
- Critical Habitat
- Important Bird Areas

Project Size (acres): 3,926.36

Lat/Long (DD): 34.9136 / -110.3640

County(s): Navajo

AGFD Region(s): Pinetop

Township/Range(s): T17N, R18E; T17N, R19E; T18N, R18

USGS Quad(s): APACHE BUTTE; JOSEPH CITY

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

Hashknife Energy Center

Township/Ranges and Land Ownership

- Project Boundary
- Buffered Project Boundary
- Township/Ranges

Land Ownership

- AZ Game & Fish Dept.
- BLM
- BOR
- Indian Res.
- Military
- Mixed/Other
- National Park/Mon.
- Private
- State & Regional Parks
- State Trust
- US Forest Service
- Wildlife Area/Refuge

Project Size (acres): 3,926.36

Lat/Long (DD): 34.9136 / -110.3640

County(s): Navajo

AGFD Region(s): Pinetop

Township/Range(s): T17N, R18E; T17N, R19E; T18N, R18

USGS Quad(s): APACHE BUTTE; JOSEPH CITY

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

Special Status Species Documented within 5 Miles of Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Astragalus xiphoides	Gladiator Milkvetch	SC			SR	
Buteo regalis	Ferruginous Hawk	SC		S		1B
Errazurizia rotundata	Roundleaf Errazurizia			S	SR	
Pediocactus peeblesianus var. peeblesianus	Peebles Navajo Cactus	LE			HS	
Sclerocactus whipplei	Whipple's Fishhook Cactus				SR	

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

Special Areas Documented within the Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Important Connectivity Zone	Wildlife Connectivity					
Little Colorado River	Apache/Navajo Counties Wildlife Movement Area - Riparian/Wash					

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

Species of Greatest Conservation Need Predicted within the Project Vicinity based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Anaxyrus microscaphus	Arizona Toad	SC		S		1B
Anodonta californiensis	California Floater	SC	S			1A
Antilocapra americana americana	American Pronghorn					1B
Aquila chrysaetos	Golden Eagle	BGA		S		1B
Aspidoscelis pai	Pai Striped Whiptail					1B
Baeolophus ridgwayi	Juniper Titmouse					1C
Buteo regalis	Ferruginous Hawk	SC		S		1B
Buteo swainsoni	Swainson's Hawk					1C
Callipepla squamata	Scaled Quail					1C
Castor canadensis	American Beaver					1B
Chordeiles minor	Common Nighthawk					1B
Corynorhinus townsendii pallescens	Pale Townsend's Big-eared Bat	SC	S	S		1B
Cynomys gunnisoni	Gunnison's Prairie Dog	SC		S		1B
Empidonax wrightii	Gray Flycatcher					1C
Euderma maculatum	Spotted Bat	SC	S	S		1B
Gymnorhinus cyanocephalus	Pinyon Jay			S		1B
Haliaeetus leucocephalus	Bald Eagle	SC, BGA	S	S		1A
Lasiurus blossevillii	Western Red Bat		S			1B
Melospiza lincolnii	Lincoln's Sparrow					1B

Species of Greatest Conservation Need Predicted within the Project Vicinity based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Mustela nigripes	Black-footed Ferret	LE,XN				1A
Myotis occultus	Arizona Myotis	SC		S		1B
Myotis yumanensis	Yuma Myotis	SC				1B
Neotoma stephensi	Stephen's Woodrat					1B
Oreoscoptes montanus	Sage Thrasher					1C
Perognathus flavus goodpasteri	Springerville Pocket Mouse	SC	S			1B
Rallus limicola	Virginia Rail					1C
Setophaga petechia	Yellow Warbler					1B
Spizella breweri	Brewer's Sparrow					1C
Sturnella magna	Eastern Meadowlark					1C
Tadarida brasiliensis	Brazilian Free-tailed Bat					1B
Troglodytes pacificus	Pacific Wren					1B
Vireo vicinior	Gray Vireo		S			1C
Vulpes macrotis	Kit Fox	No Status				1B

Species of Economic and Recreation Importance Predicted within the Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Antilocapra americana americana	America Pronghorn					1B
Cervus elaphus	Elk					
Odocoileus hemionus	Mule Deer					
Puma concolor	Mountain Lion					
Zenaida 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 potential introduction or spread of exotic invasive species. Invasive species can be plants, animals (exotic snails), and other organisms (e.g., microbes), which may cause alteration to ecological functions or compete with or prey upon native species and can cause social impacts (e.g., livestock forage reduction, increase wildfire risk). The terms noxious weed or invasive plants are often used interchangeably. Precautions should be taken to wash all equipment utilized in the project activities before leaving the site. Arizona has noxious weed regulations (Arizona Revised Statutes, Rules R3-4-244 and R3-4-245). See Arizona Department of Agriculture website for restricted plants, https://agriculture.az.gov/. Additionally, the U.S. Department of Agriculture has information regarding pest and invasive plant control methods including: pesticide, herbicide, biological control agents, and mechanical control, https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/quality/?cid=stelprdb1044769 The Department regulates the importation, purchasing, and transportation of wildlife and fish (Restricted Live Wildlife), please refer to the hunting regulations for further information https://www.azgfd.com/hunting/regulations.

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 herptefauna (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 (http://www.fws.gov/southwest/es/arizona/).

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:
HDMS records indicate that one or more native plants listed on the **Arizona Native Plant Law and Antiquities Act** have been documented within the vicinity of your project area. Please contact:
Arizona Department of Agriculture
1688 W Adams St.
Phoenix, AZ 85007
Phone: 602.542.4373
https://agriculture.az.gov/sites/default/files/Native%20Plant%20Rules%20-%20AZ%20Dept%20of%20Ag.pdf starts on page 44

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

Analysis indicates that your project is located in the vicinity of an identified ***wildlife habitat connectivity feature***. The **Statewide Wildlife Connectivity Assessment's Important Connectivity Zones** (ICZs) represent general areas throughout the landscape which contribute the most to permeability of the whole landscape. ICZs may be used to help identify, in part, areas where more discrete corridor modeling ought to occur. 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://s3.amazonaws.com/azgfd-portal-wordpress/azgfd.wp/wp-content/uploads/0001/01/23120719/ALIWCA_Final_Report_Perkl_2013_lowres.pdf.
Please contact the Project Evaluation Program (pep@azgfd.gov) for specific project recommendations.

APPENDIX B

Data Requests – U.S. Fish and Wildlife Service

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arizona Ecological Services Field Office
9828 North 31st Ave
#c3
Phoenix, AZ 85051-2517
Phone: (602) 242-0210 Fax: (602) 242-2513
http://www.fws.gov/southwest/es/arizona/
http://www.fws.gov/southwest/es/EndangeredSpecies_Main.html

In Reply Refer To: July 07, 2020
Consultation Code: 02EAAZ00-2020-SLI-1077
Event Code: 02EAAZ00-2020-E-02388
Project Name: Hashknife Solar Facility (2020)

Subject: List of threatened and endangered species that may occur in your proposed project location, and/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 one or more delineated United States Geological Survey 7.5 minute quadrangles with which your project polygon intersects. Each quadrangle covers, at minimum, 49 square miles. In some cases, a species does not currently occur within a quadrangle but occurs nearby and could be affected by a project. Please refer to the species information links found at:
http://www.fws.gov/southwest/es/arizona/Docs_Species.htm
http://www.fws.gov/southwest/es/arizona/Documents/MiscDocs/AZSpeciesReference.pdf .

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 consult with us if their 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, we recommend preparing a biological evaluation similar to a Biological Assessment 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. You should request consultation with us 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 effects. If the Federal action agency determines that the action may jeopardize a proposed species or 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 considering them 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 1026 species of birds are protected by the MBTA, including species such as the western burrowing owl (Athene cunicularia hypugea). Protected western burrowing owls are often 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, you should evaluate your project to determine whether it is likely to disturb or harm eagles. The National Bald Eagle Management Guidelines provide recommendations to minimize potential project impacts to bald eagles:
https://www.fws.gov/migratorybirds/pdf/management/
nationalbaldeaglenanagementguidelines.pdf
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: https://www.fws.gov/birds/policies-and-regulations/incidental-take.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/birds/bird-enthusiasts/threats-to-birds/collisions/communication-towers.php.

Activities that involve streams (including intermittent streams) and/or wetlands are regulated by the U.S. Army Corps of Engineers (Corps). 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.
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.

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/HeritageFund/.

For additional communications regarding this project, please refer to the consultation Tracking Number in the header of this letter. We appreciate your concern for threatened and endangered species. If we may be of further assistance, please contact our following offices for projects in these areas:

Northern Arizona: Flagstaff Office 928/556-2001
Central Arizona: Phoenix office 602/242-0210
Southern Arizona: Tucson Office 520/670-6144

Sincerely,
/s/ Jeff Humphrey Field Supervisor

Attachment

Attachment(s):

- Official Species List

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

Consultation Code: 02EAAZ00-2020-SLI-1077

Event Code: 02EAAZ00-2020-E-02388

Project Name: Hashknife Solar Facility (2020)

Project Type: POWER GENERATION

Project Description: Solar energy facility.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/34.91805811167729N110.36764063178498W

Counties: Navajo, AZ

Endangered Species Act Species

There is a total of 7 threatened, endangered, or candidate species on this species list.

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

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], 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
Gray Wolf *Canis lupus* Population: Mexican gray wolf, EXPN population No critical habitat has been designated for this species.	Proposed Experimental Population, Non-Essential

Birds

NAME	STATUS
California Condor *Gymnogyps californianus* Population: U.S.A. only, except where listed as an experimental population There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8193	Endangered
California Condor *Gymnogyps californianus* Population: U.S.A. (specific portions of Arizona, Nevada, and Utah) There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/8193	Experimental Population, Non-Essential
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **proposed** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Reptiles

NAME	STATUS
Northern Mexican Gartersnake *Thamnophis eques megalops* There is **proposed** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7655	Threatened

Fishes

NAME	STATUS
Little Colorado Spinedace *Lepidomeda vittata* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6640	Threatened

Flowering Plants

NAME	STATUS
Peebles Navajo Cactus *Pediocactus peeblesianus var. peeblesianus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8245	Endangered

Critical habitats

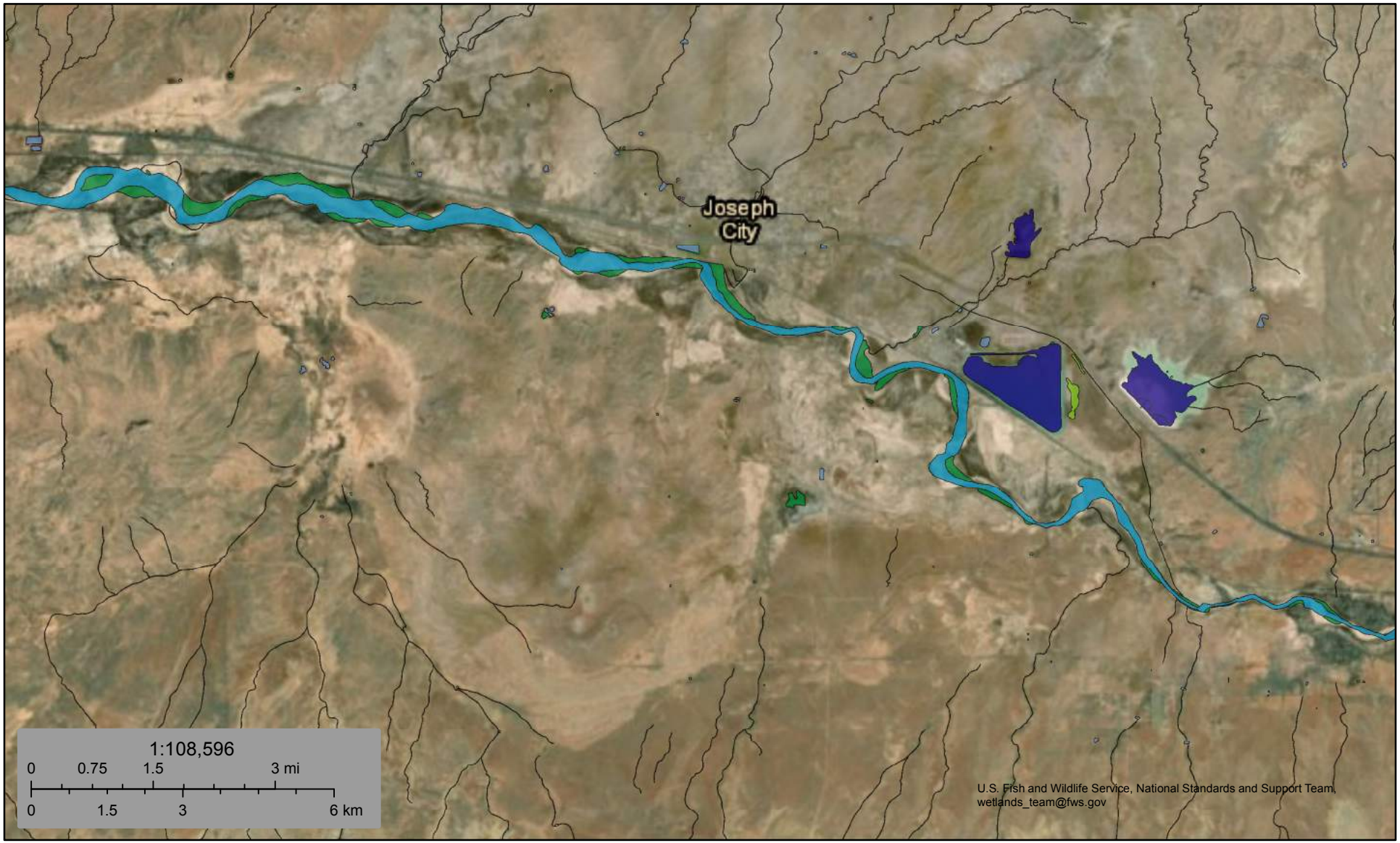
THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

APPENDIX C

U.S. Fish and Wildlife Service National Wetlands Inventory Data

U.S. Fish and Wildlife Service
National Wetlands Inventory

Hashknife Solar Facility



April 24, 2019

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

APPENDIX D

Site Evaluation Photos

Photo D.1. Project area facing north toward Joseph City

Photo D.2. Existing transmission line facing northeast

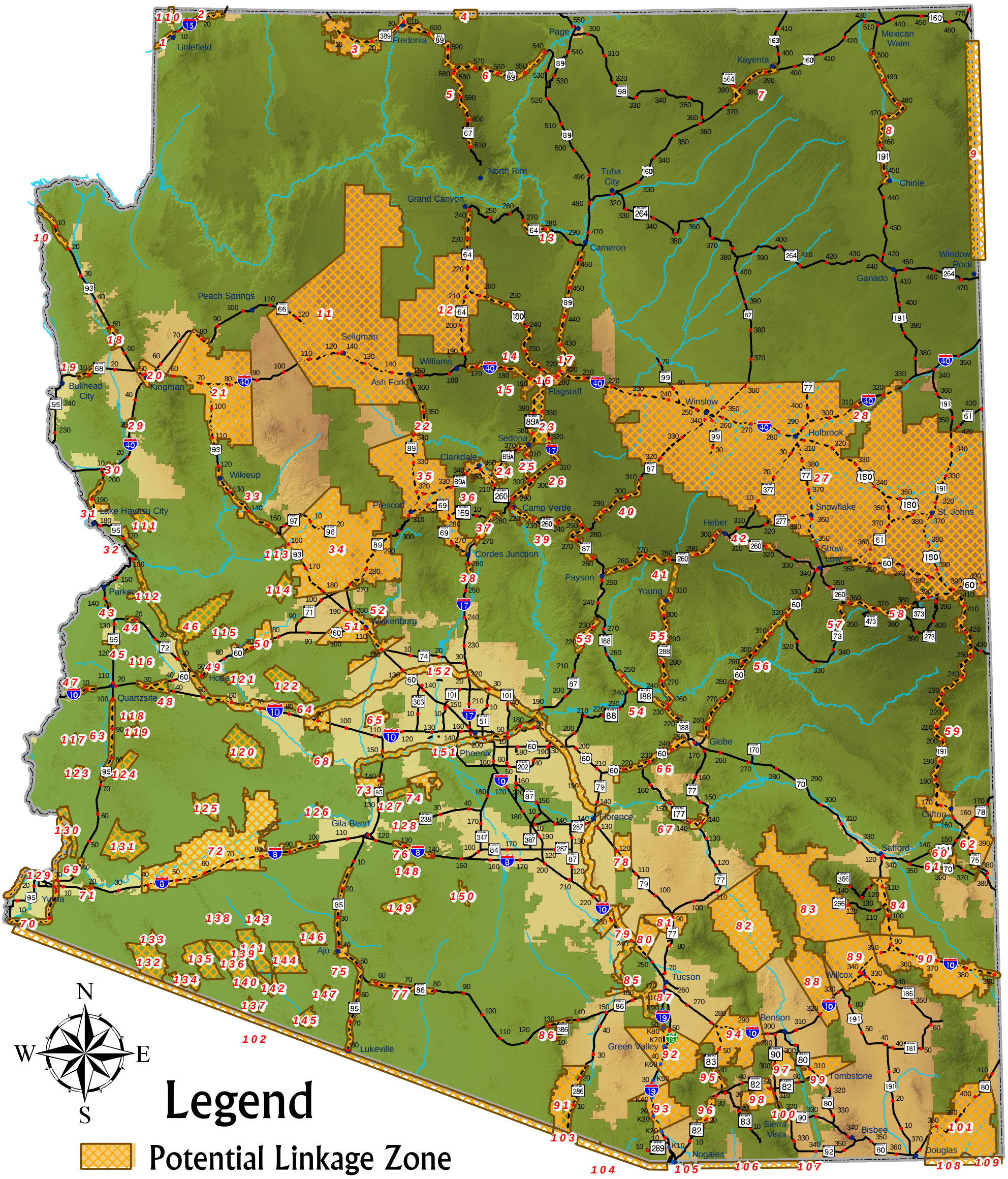
Photo D.3. Project area facing west

Photo D.4. Existing transmission line at Little Colorado River facing south

APPENDIX E

Arizona's Wildlife Linkages Map

ARIZONA'S WILDLIFE LINKAGES



Note: Linkage numbers are for identification purposes only. These numbers do not imply priority status.

Each proposed Potential Linkage Zone polygon depicts a planning area of which only a small fraction of this polygon could be included in a wildlife linkage, if deemed appropriate through future studies. Private landowners within identified wildlife linkages are encouraged to participate in voluntary federal and state programs that pay land owners for conservation of their lands, voluntary sale or donations of conservation easements, voluntary changes in management to protect ecological property values, or voluntary sale or donation of lands to conservation buyers. State and Federal agencies are encouraged to coordinate with private landowners during the planning process of linkage projects and to inform them of voluntary habitat protection opportunities.

This map is part of a dynamic process and should not be considered the definitive revision. To suggest additional Potential Linkage Zones or to provide comments for future editions of this map, please contact arizonalinkages@azdot.gov.

Siobhan Nordhaugen

APPENDIX B-2 – WETLANDS AND OTHER WATERS OF THE U.S. DELINEATION REPORT

WETLANDS AND OTHER WATERS OF THE U.S. DELINEATION REPORT FOR THE HASHKNIFE ENERGY CENTER PROJECT

JULY 2020

PREPARED FOR

Hashknife Energy Center LLC

PREPARED BY

SWCA Environmental Consultants

WETLANDS AND OTHER WATERS OF THE U.S. DELINEATION REPORT FOR THE HASHKNIFE ENERGY CENTER PROJECT

Prepared for

Hashknife Energy Center LLC
One South Wacker Drive, Suite 1800
Chicago, Illinois 60606

Prepared by

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114 North San Francisco Street, Suite 100
Flagstaff, Arizona 86001
(928) 774-5500
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July 2020

CONTENTS

Appendices

Tables

1. INTRODUCTION

Hashknife Energy Center LLC contracted SWCA Environmental Consultants (SWCA) to delineate wetlands and other waters of the U.S. (WOTUS) within the Hashknife Energy Center Project area (herein called the Project area) in Navajo County, Arizona.

Hashknife Energy Center LLC is proposing to build a solar energy facility located approximately 2 miles south of Joseph City and Interstate 40 (Appendix A, Figure 1). The proposed Hashknife Energy Center Project (herein called the Project) is a 400-megawatt nameplate capacity facility encompassing approximately 3,216 acres of privately-owned land and 628 acres of Arizona State Trust Lands. Two proposed electrical generation-tie (gen-tie) routes crossing privately owned lands connect the Project to an electrical substation (the Cholla Substation) approximately 2.4 miles to the northeast. Potential WOTUS within a portion of the Project area were delineated in April 2019. In 2020, the Project area was expanded to include additional land for the solar facility and the proposed electrical gen-tie routes (see Appendix A, Figure 1). The Project area is located within portions of Section 4-6 of Township 17 North (T17N), Range 19 East (R19E); Section 36 of T18N, R18E; and Sections 20-23 and 27-34 of T18N, R19E, Gila and Salt River Baseline and Meridian. The approximate center point of the Project area is at 34.915427º N, -110.367709º W.

2. METHODS

2.1 Desktop Review

Before conducting field investigations, SWCA personnel completed a desktop review to identify potential WOTUS, including wetlands and other special aquatic sites as defined under the Clean Water Act (CWA),[1] within the boundaries of the Project area. SWCA personnel reviewed recent aerial photographs of the Project area and accessed online datasets relative to floodplains, hydrology, wetlands, and soils to identify and characterize surface water features within the boundaries of the Project area. SWCA accessed the following public databases and data sources for the desktop review:

- Google Earth aerial photograph images (Google Earth 2019 and 2020)
- U.S. Environmental Protection Agency (USEPA) Watershed Assessment, Tracking and Environmental Results System (WATERS) surface water information system (USEPA 2020), which includes the U.S Geological Survey (USGS) National Hydrography Dataset (USGS 2019a) and the Watershed Boundary Dataset (USGS 2019b)
- USGS provisional digital land cover map for the Southwestern United States (USGS 2004)
- Natural Resources Conservation Service (NRCS) Soil Survey data (NRCS 2019)
- Wetland indicator plant list for Arizona (Lichvar et al. 2016)
- USGS topographic maps (Joseph City, Ariz. and Apache Butte, Ariz. 7.5-minute quadrangles)
- Federal Emergency Management Agency (FEMA) flood insurance rate map (FIRM) panels (FEMA 2008)
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps (USFWS 2019)

[1] United States Code Title 33 Part 328.3 (a)

Based on the results of the desktop review, a CWA specialist created a KMZ file containing data points for surface water features to be investigated in the field for characteristics of WOTUS. Characteristics such as ordinary high water marks (OHWMs) and indicators of wetlands such as hydrology, hydric soils, and hydrophytic (wetland) vegetation were identified during the field survey.

2.2 Field Survey

The field survey was performed on April 9 and 10, 2019, and July 13, 2020 to assess the potential limits of U.S. Army Corps of Engineers (USACE) jurisdiction in accordance with the 1987 *Corps of Engineers Wetland Delineation Manual* (USACE 1987), the *Arid West Regional Supplement* (USACE 2008a), *A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States* (USACE 2008b), *Regulatory Guidance Letter RGL 05-05 Ordinary High Water Mark (OHWM) Identification* (USACE 2005), and *Updated Datasheet for the Identification of the Ordinary High-Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE 2010).

Arid West Ephemeral and Intermittent Streams OHWM Datasheets were not completed for each individual drainage, with the exception of the Little Colorado River; however, drainage characteristics were documented for each drainage electronically. This modification of the guidance in the USACE's field guide has been used in the past for projects in Arizona and accepted by the Arizona Regulatory Branch of the USACE because none of the drainages encountered within the Project area, with the exception of the Little Colorado River, contain a wide floodplain with migrating channels, shelving, and terraces. The exception is the Little Colorado River where the gen-tie line crossing would occur, in this case, wetland delineations and OHWM identifications were completed without modifications to the datasheets. Wetland delineation methods completed along the Little Colorado River were routine.

Wetland Determination Data Forms for the Arid West Region were used to document and characterize potential wetland areas and identify their boundaries (Appendix B). In order to be considered a USACE- regulated wetland, an aquatic feature must display all three of the following criteria: 1) a dominance of hydrophytic vegetation, 2) indicators of hydrology to support the hydrophytic vegetation (i.e., wetland hydrology), and 2) hydric (i.e., low chroma) soil development. Wetland delineations involve the placement of data points to determine the wetland/upland boundary. In Arizona, there is a vast difference in upland versus wetland plant communities that result in a very distinct vegetation change that can be visually identified. For this project, data points were taken at the vegetation change boundary and involve digging a soil pit to determine the soil texture and color to compare to hydric soil conditions, identifying and quantifying the plant species and percent cover within a 30m radius of the soil pit, and assessing the hydrologic conditions present. In addition, in accordance with the Navigable Water Protection Rule (NWPR) described in Section 2.3 below, wetlands protected under the jurisdiction of the CWA must be adjacent to a Category 1, 2, or 3 jurisdictional waters.

During field reconnaissance, SWCA team members traversed the Project area by vehicles and on foot. Ground-level photographs (Appendix C) were taken at drainage features and potential WOTUS features, and field data locations were recorded using global positioning system (GPS) technology. Field data were then transferred to geographic information system (GIS) data and mapped to aerial photographs to create figures that depict locations of sample points and potential WOTUS within the Project area (see Appendix A, Figures 2A–2L).

2.3 Navigable Waters Protection Rule

Under the NWPR, effective in Arizona as of June 22, 2020, WOTUS are defined as 1) territorial seas and traditional navigable waters (TNWs); 2) perennial and intermittent tributaries that contribute surface water flow to Category 1 waters in a typical year; 3) certain lakes, ponds, and impoundments of jurisdictional waters; and 4) wetlands adjacent to other jurisdictional waters. Under the NWPR, all ephemeral streams (e.g., arroyos) are categorically excluded from being considered a WOTUS and therefore are not federally protected under the CWA. Section 404 permits for dredge or fill activities would not be necessary for impacts to such drainage features. However, the NWPR is currently being challenged by a series of lawsuits and a house bill, including a lawsuit by a coalition of tribes that was filed in Arizona. The future status of the NWPR is unknown while litigation is pending, and ephemeral waters may reenter jurisdiction under the CWA depending on the outcome the litigation. Therefore, SWCA also reviewed the Project area for ephemeral streams and other water features that were likely considered jurisdictional under the pre-NWPR definition.

3. RESULTS

3.1 Topography, Soils, and Vegetation

The Project area consists of flat terrain, ranging in elevation from approximately 4,990 feet to 5,120 feet above mean sea level. Overall slope across the Project area varies from approximately 0% to 0.5%. The dominant soil types in the Project area are Epikom channery sandy loam and Purgatory fine sandy loam, which both have a well-drained natural drainage class and have no hydric rating. The Project area is dominated by upland plants typical of the Inter-Mountain Basins Semi-Desert Grassland vegetation association, such as big sagebrush (*Artemisia tridentata*), saltbush (*Atriplex* spp.), blackbrush (*Coleogyne* spp.), and other xeric shrub species. Dominant grass species include Indian ricegrass (*Achnatherum hymenoides*), threeawn (*Aristida* spp.), blue grama (*Bouteloua gracilis*), and dropseed (*Sporobolus* spp.).

3.2 Hydrology

The Project area lies within the McDonald Canyon–Little Colorado River sub-basin (10-digit Hydrologic Unit Code 1502000806) of the Little Colorado River watershed, as defined by the USGS's Watershed Boundary Dataset (USGS 2019b). The Little Colorado River is an intermittent stream where it crosses the Project area. The little Colorado River is not listed as a Section 10 water or a TNW (USACE 2020).

The Project area lies within FEMA FIRM panels 04017C3300E, 04017C3303E, 04017C3304E, 04017C3308E, 04017C3312E, 04017C3315E, and 04017C3316E. Zone A special flood hazard areas (i.e., 100-year floodplains) are found along the Little Colorado River and extend in some portions of the Project area west of Obed Road. The 30-year average annual precipitation for Winslow, Navajo County, Arizona, is 6.6 inches (National Oceanic and Atmospheric Administration 2020).

A check of the Arizona Department of Water Resources (ADWR) website registry of wells in Arizona indicates that depth to groundwater in the Project area ranges from 43 feet below the surface to 111 feet below the surface (ADWR 2020). A check of a nearby well registered in the Little Colorado River floodplain indicates a depth to groundwater of 20 feet.

3.3 Drainage Features

The desktop review identified two named and several unnamed surface water features within the Project area. The Little Colorado River and Tanner Wash are the only named surface water features present in the Project area; both cross the gen-tie corridors and are not located in the main portion of the Project area. Two unnamed features are identified by the National Hydrography Dataset (USGS 2019a) in the westernmost section of the Project area. Additional drainages were identified on aerial photographs during the desktop review. All surface water features identified during the desktop review of the Project area were investigated during the field reconnaissance. Thirty-five sample points were taken at drainage features during the field survey, and nine sample points were taken to document wetland/upland conditions in April 2019; an additional 22 sample points were investigated in July 2020. A total of 22 ephemeral surface water features and the Little Colorado River, an intermittent surface water feature, were determined to contain OHWMs in the Project area (Table 1).

Table 1. Summary of Surface Water Features within the Project Area.

Feature ID (Wash Name)	Field Survey Date	Location	Potential Jurisdictional Status*	Acreage of potential WOTUS within Project Area*
0713-1 (Little Colorado River)	04/09/19	34.934645/ -110.303839	WOTUS., non-wetland	1.65
0409af02 (Tanner Wash)	04/09/19	34.939100/ -110.312243	Not a WOTUS, has OHWMs	0.0
0409af03 (Little Colorado River)	04/09/19	34.938777/ -110.316163	WOTUS, non-wetland	12.76
0409af04 (Wash A)	04/09/19	34.909580/ -110.393294	Not a WOTUS, has OHWMs	0.0
0409af05 (Wash B)	04/09/19	34.936974/ -110.351289	Not a WOTUS, has OHWMs	0.0
0409af06 (Wash C)	04/09/19	34.936976/ -110.357535	Not a WOTUS, has OHWMs	0.0
0409af07 (Wash D)	04/09/19	34.937713/ -110.358691	Not a WOTUS, has OHWMs	0.0
0409ca01 (Wash E)	04/09/19	34.914580/ -110.393753	Not a WOTUS, has OHWMs	0.0
0409ca02 (Wash B1)	04/09/19	34.920151/ -110.361134	Not a WOTUS, has OHWMs	0.0
0409ca04 (Wash B2)	04/09/19	34.921272/ -110.359554	Not a WOTUS, has OHWMs	0.0
0409ca05 (Wash F)	04/09/19	34.935586/ -110.370300	Not a WOTUS, has OHWMs	0.0
0409ca06 (Wash G)	04/09/19	34.936328/ -110.375572	Not a WOTUS, has OHWMs	0.0
0409ca07 (Wash H)	04/09/19	34.934633/ -110.374368	Not a WOTUS, has OHWMs	0.0
0410af01 (Wash I)	04/10/19	34.904277/ -110.346639	Not a WOTUS, has OHWMs	0.0
0410af02 (Wash I)	04/10/19	34.905746/ -110.344557		
0410af06 (Wash J1)	04/10/19	34.902309/ -110.360023	Not a WOTUS, has OHWMs	0.0
0410af07a (Wash J)	04/10/19	34.901816/ -110.359197	Not a WOTUS, has OHWMs	0.0

Feature ID (Wash Name)	Field Survey Date	Location	Potential Jurisdictional Status*	Acreage of potential WOTUS within Project Area*
0410af07b (Wash J)	04/10/19	34.900738/ -110.357128		
0410af12 (Wash K)	04/10/19	34.908211/ -110.357748	Not a WOTUS, has OHWMs	0.0
0410af13 (Wash L)	04/10/19	34.909857/ -110.354593	Not a WOTUS, has OHWMs	0.0
0410af14 (Wash M)	04/10/19	34.913770/ -110.349312	Not a WOTUS, has OHWMs	0.0
0410af15 (Wash B3)	04/10/19	34.917114/ -110.353179	Not a WOTUS – OHWMs present	0.0
0410af16 (Wash N)	04/10/19	34.920724/ -110.349069	Not a WOTUS, has OHWMs	0.0
0410af17 (Wash O)	04/10/19	34.921946/ -110.345066	Not a WOTUS, has OHWMs	0.0
0410af18 (Wash P)	04/10/19	34.921227/ -110.344663	Not a WOTUS, has OHWMs	0.0
0713-2 to 0713-12 (Wash A)	07/13/20	34.901430/ -110.36356	Not a WOTUS, has OHWMs	0.0
0713-17 and 0713-18 (Wash Q)	07/13/20	34.896014/ -110.375896	Not a WOTUS, has OHWMs	0.0
Total	**–**	**–**	**–**	**14.41**

* As defined by the NWPR (see Section 2.3)

All of the unnamed drainage features in the Project area are ephemeral and/or erosional in nature and therefore, are not considered WOTUS. Some of the unnamed ephemeral and erosional features originate within the Project area and do not discharge flows downstream of the Project area. Some, but not all, of the ephemeral features failed to display a continuous bed and bank or OHWM. All surface water features that displayed indicators of OHWM and bed and bank, regardless of their CWA jurisdictional status, are depicted on Figures 2A-2L in Appendix A.

In addition to the Little Colorado River and its riparian fringe, three features are identified by the USFWS NWI mapper in the Project area. These three features are identified by the NWI mapper as freshwater ponds, Cowardin Class PUSAh and PUSCh (Cowardin et al., 1979), and were confirmed in the field to be isolated livestock ponds. Each of the three features were investigated and identified as non-wetland features (see Appendix B) either because of a lack of dominant hydrophytic vegetation, a lack of wetland hydrology, and/or a lack of hydric soils development, as well as a lack of adjacency to a WOTUS.

3.4 Potentially Jurisdictional Waters Summary

Based on the desktop review and field reconnaissance—and the current definition of WOTUS under the NWPR—the Little Colorado River is identified as a the only potential WOTUS in the Project area. The Little Colorado River has intermittent flows in the Project area and likely contributes surface water flow in a typical year to a TNW (i.e., directly to the navigable-in-fact Colorado River in the Grand Canyon). The other named feature identified in the Project area, Tanner Wash, exhibited indicators of an OHWM and a bed and bank; however, available data (i.e., field observations, depth to groundwater, size of drainage area, proximity to mountains receiving adequate snowfall to potentially receive spring snow melt runoff, etc.) indicate that Tanner Wash is ephemeral and flows only in direct response to localized

rainfall events. Therefore, Tanner Wash would not be considered WOTUS per the exclusion under the NWPR.[2]

All of the unnamed drainage features encountered on the Project area are ephemeral drainages that flow only in direct response to localized precipitation events. These ephemeral drainages are considered non-jurisdictional under the NWPR. It should be noted that many ephemeral features on-site show poor development of bed and banks, have discontinuous OHWMs, and in most cases can be described as small erosion features or swales. This is owing to the very low gradient of the site, the soil characteristics, and the low annual precipitation, which promote infiltration and evaporation over long-distance stormwater runoff. Even under the pre-NWPR WOTUS definition, these ephemeral drainages would likely not have a significant influence on the nearest TNW (i.e., the Colorado River) located more than 120 miles downstream of the Project area and therefore would likely not be considered WOTUS.

The desktop research and field investigation indicate that there are no jurisdictional wetlands within the Project area; no areas met all three wetland parameters (i.e., wetland vegetation, wetland hydrology, and hydric soil development). In addition, all NWI-identified freshwater ponds in the Project area were determined to be livestock ponds that are fed by non-jurisdictional ephemeral features or ground water, and are not adjacent to jurisdictional features (i.e., they are isolated). Under the NWPR, these livestock ponds in the Project area do not meet the definition of WOTUS.

The USACE and the USEPA have the ultimate authority to determine what is jurisdictional and considered a WOTUS, including wetlands, for CWA permitting purposes. Depending on planned Project-related impacts, final jurisdictional determinations of the surface water features in the Project area should be completed by the Arizona Regulatory Branch of the USACE via a submittal of the appropriate request forms for a jurisdictional determination with this report as supporting documentation.

4. LIMITATIONS AND WARRANTY

The results and conclusions of this report represent the best professional judgment of SWCA scientists and are based on information provided by the Project proponent and obtained from agencies and other sources during the course of the study. No other warranty, expressed or implied, is made.

[2] Due to the presence of OHWM indicators and a bed and banks and connectivity to the Little Colorado River, Tanner Wash would likely be considered a WOTUS under the pre-NWPR WOTUS definition.

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APPENDIX A

Supporting Figures

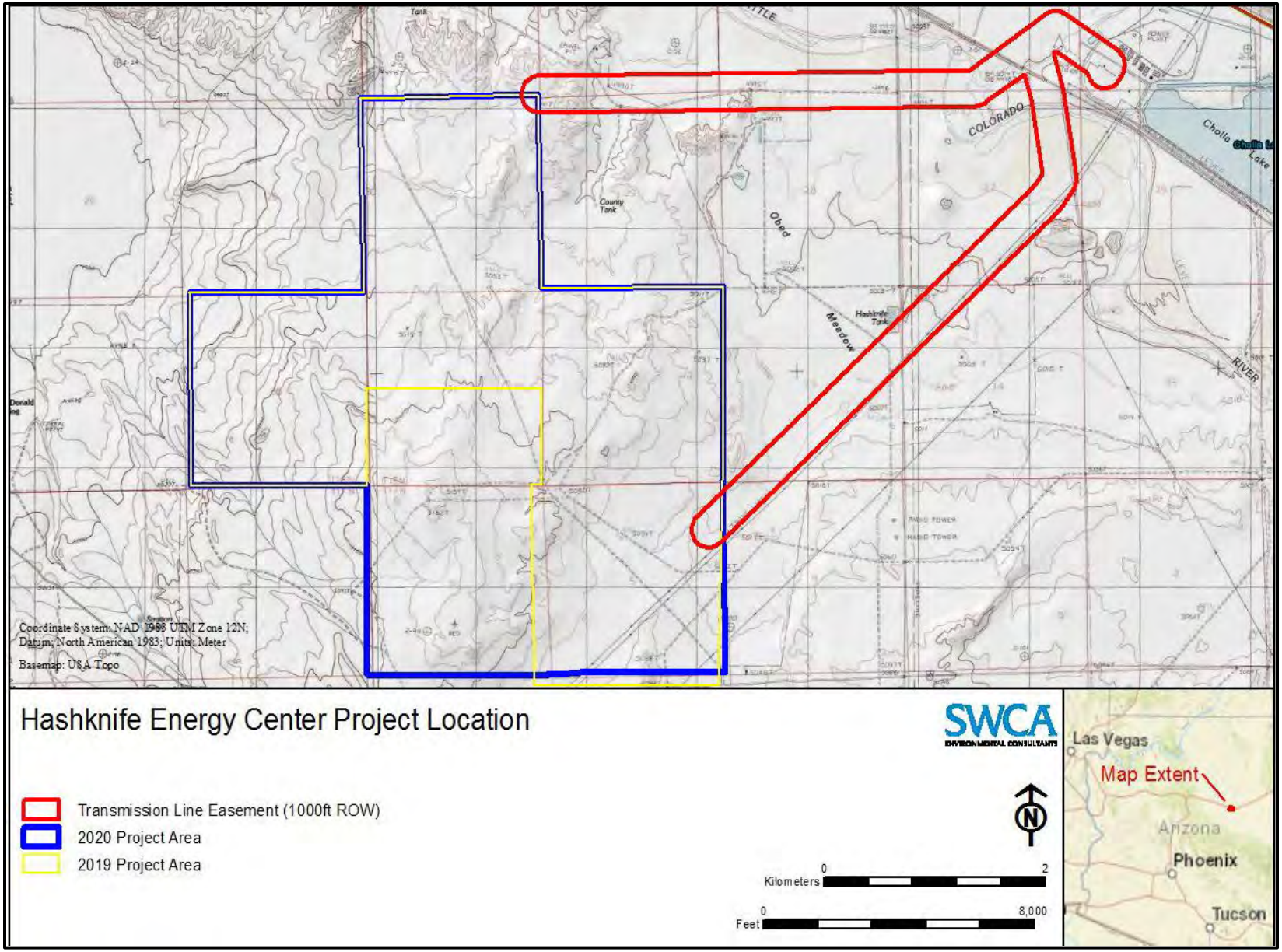


Figure 1A. Hashknife Energy Center Project location.

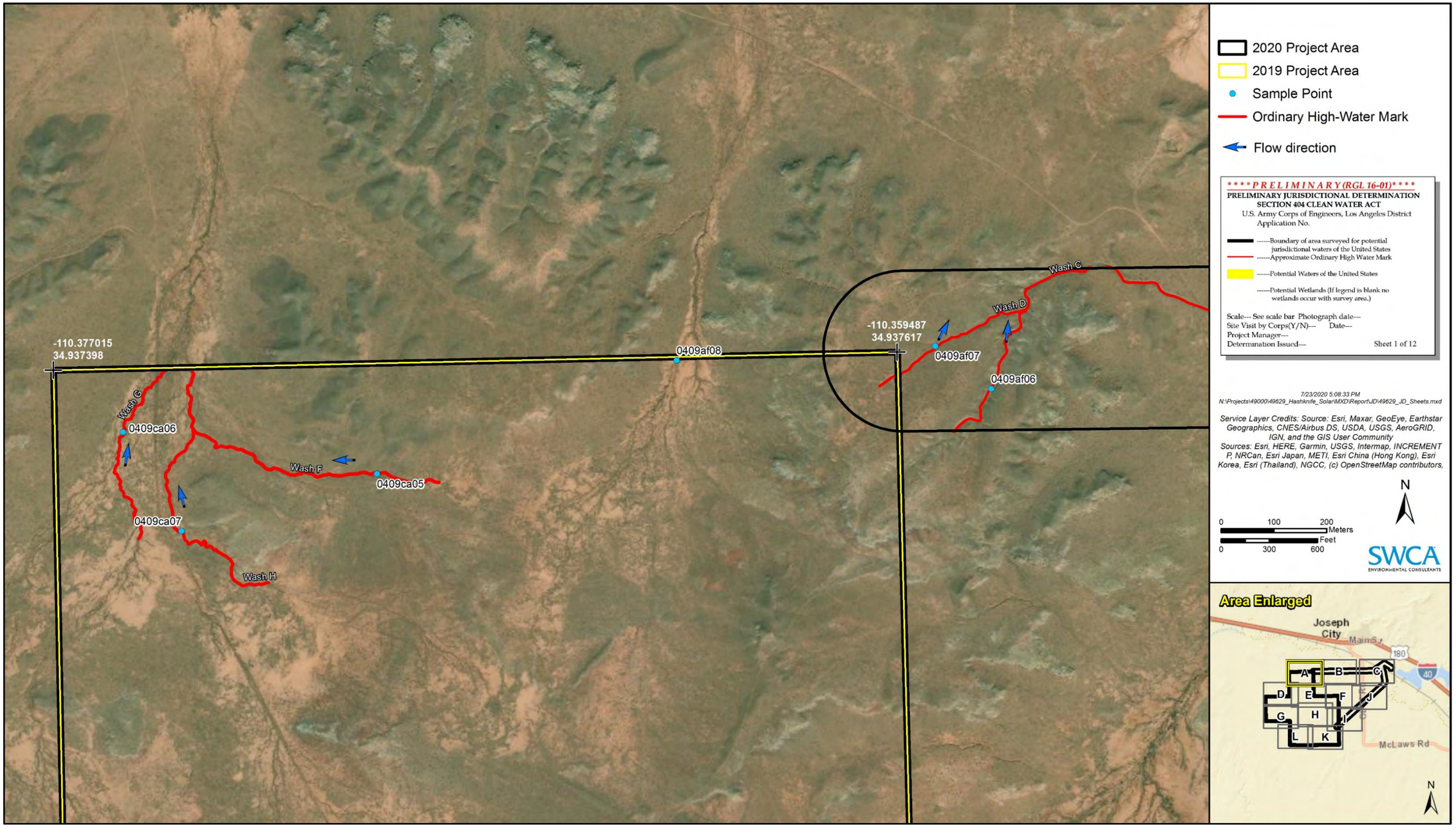


Figure 2A. Hashknife Energy Center Project Wetlands and Other Waters of the U.S.

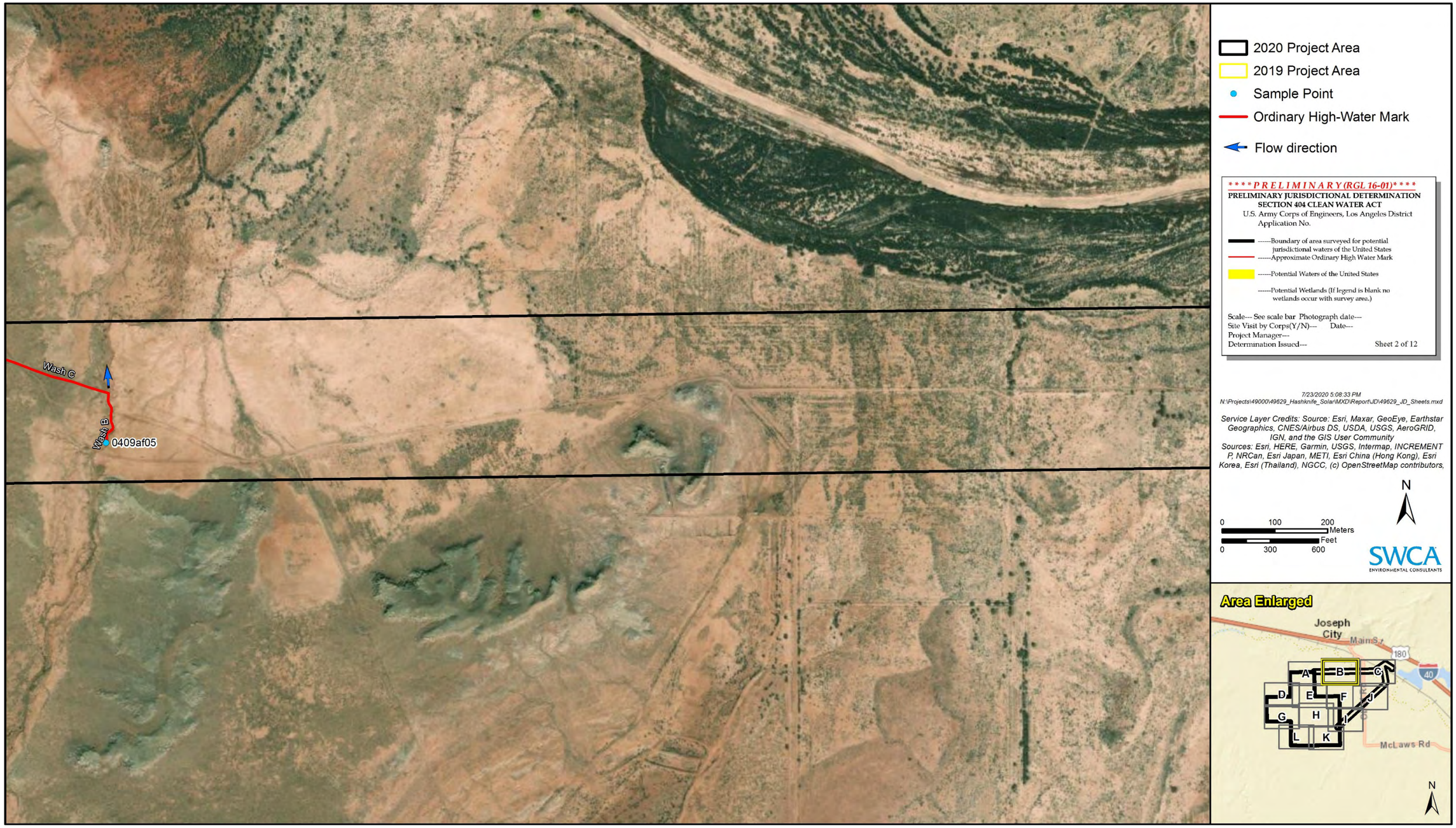


Figure 2B. Hashknife Energy Center Project Wetlands and Other Waters of the U.S.

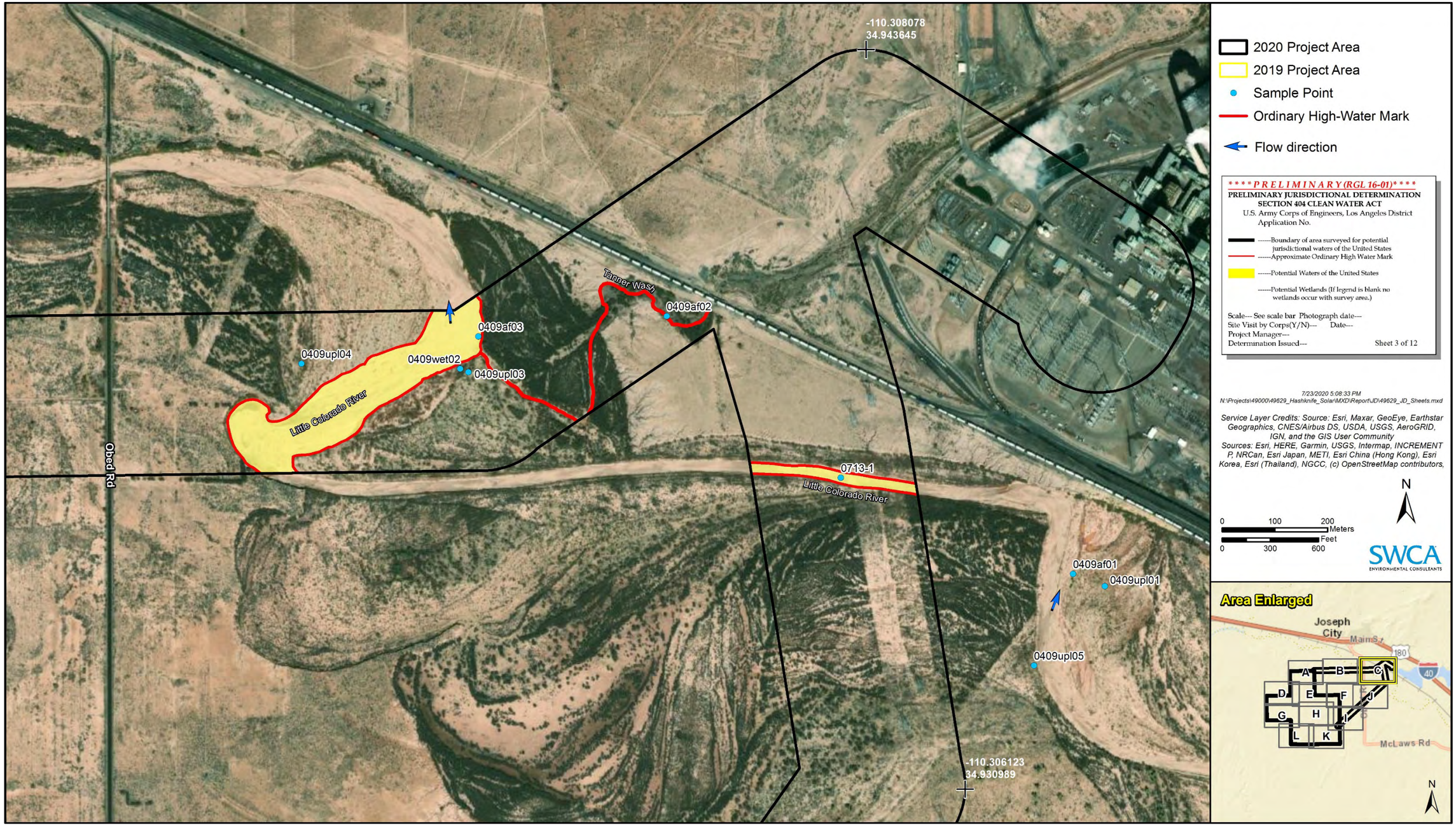


Figure 2C. Hashknife Energy Center Project Wetlands and Other Waters of the U.S.

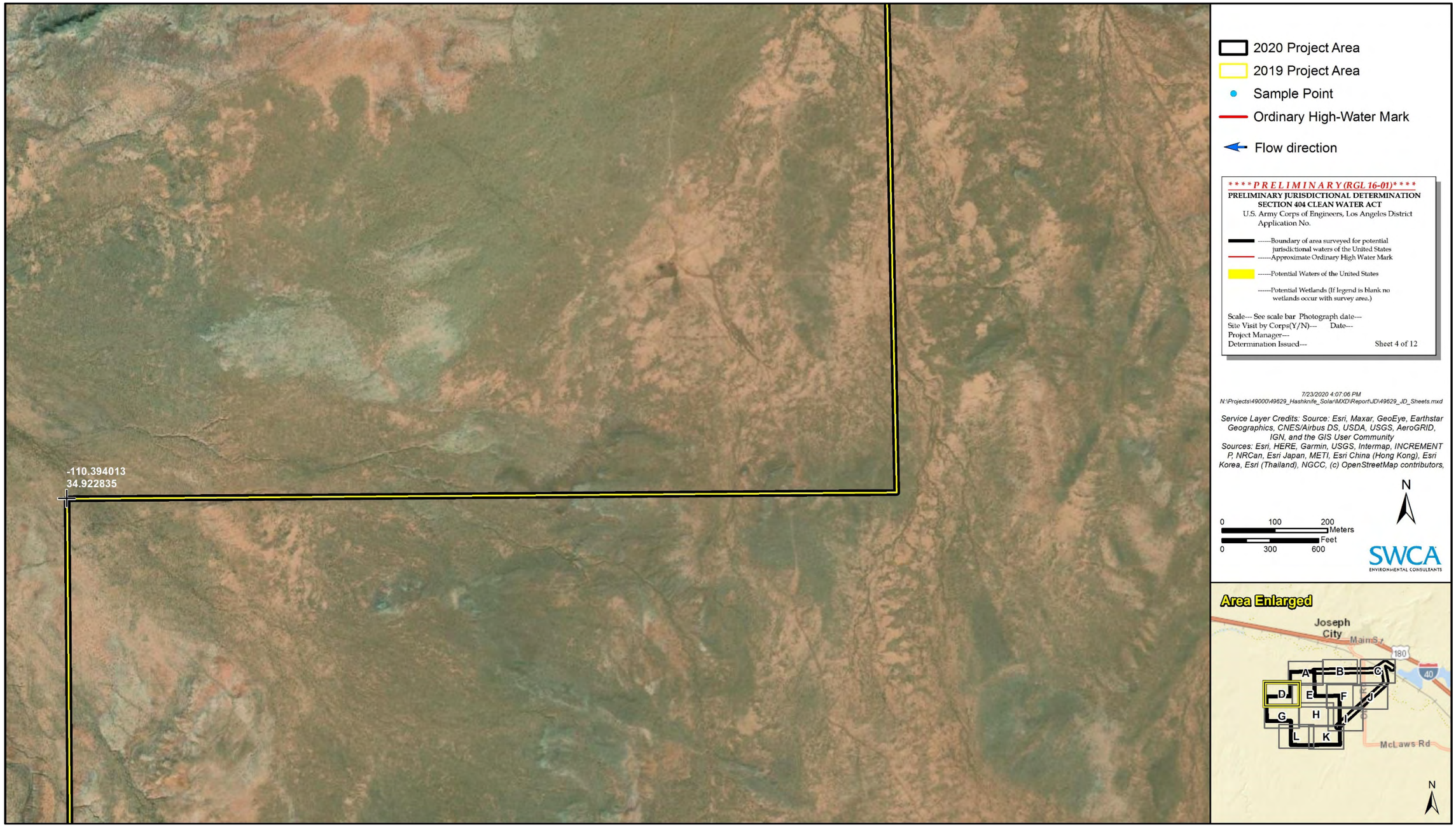


Figure 2D. Hashknife Energy Center Project Wetlands and Other Waters of the U.S.

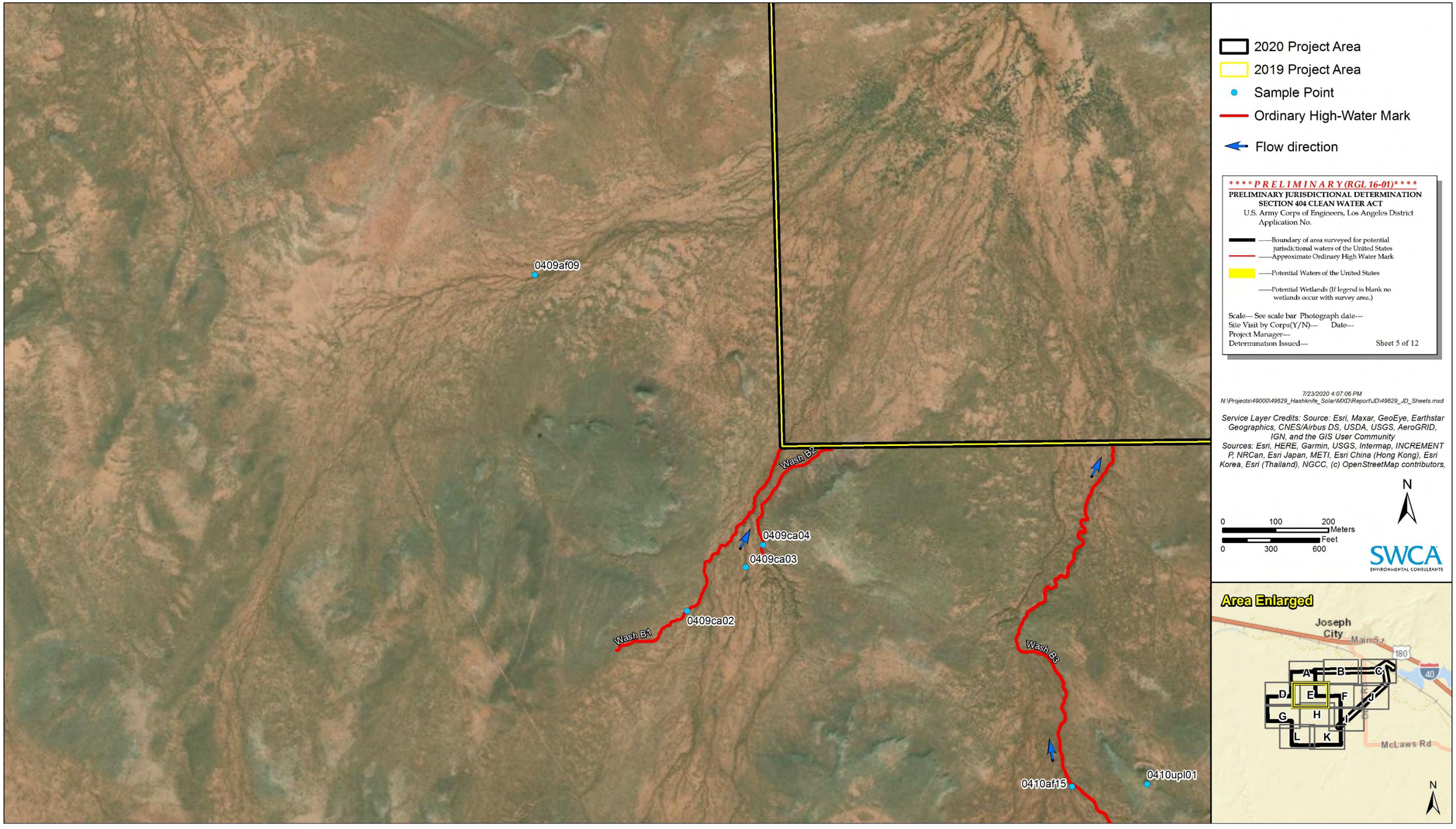


Figure 2E. Hashknife Energy Center Project Wetlands and Other Waters of the U.S.

Figure 2F. Hashknife Energy Center Project Wetlands and Other Waters of the U.S.

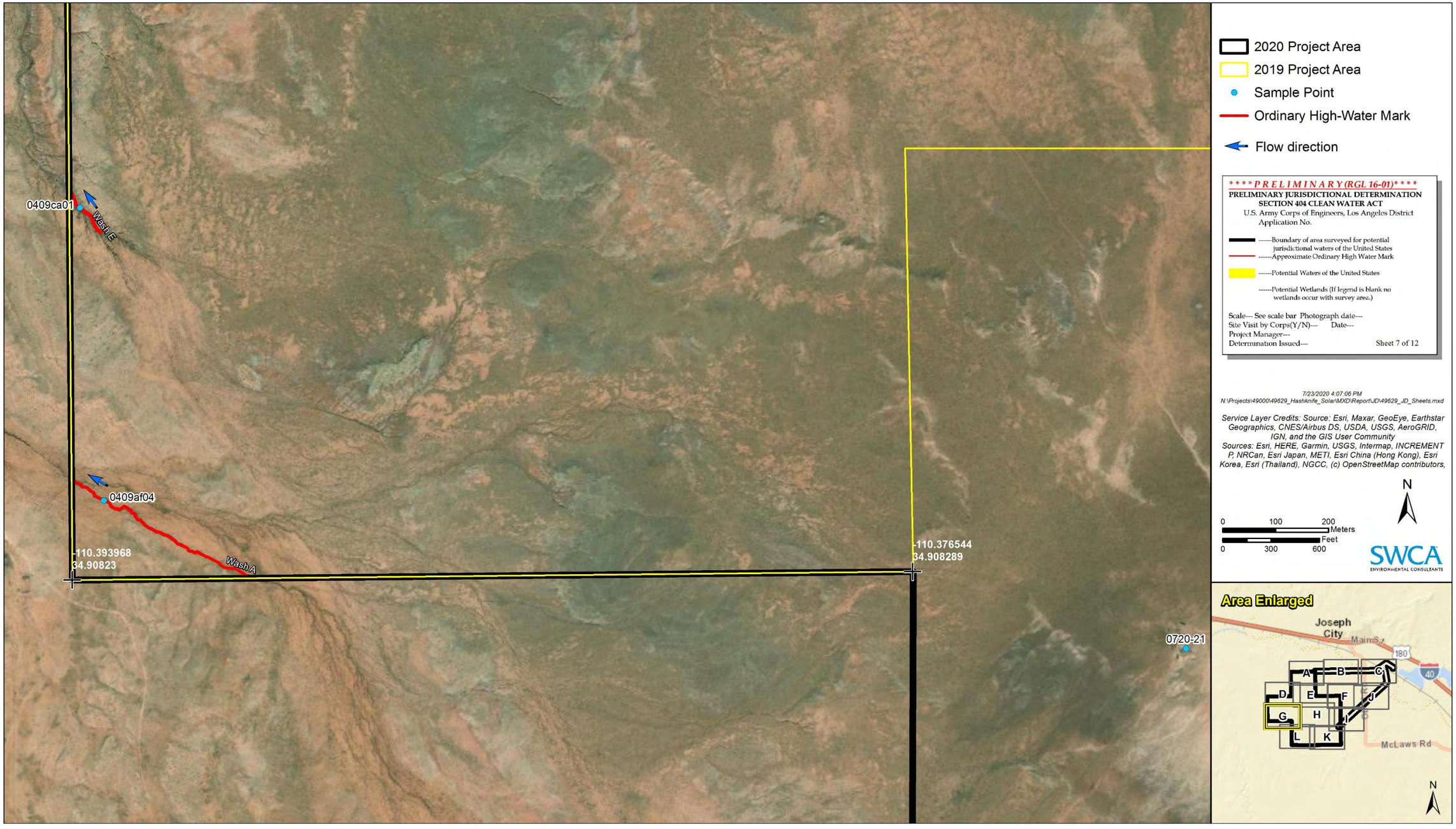


Figure 2G. Hashknife Energy Center Project Wetlands and Other Waters of the U.S.

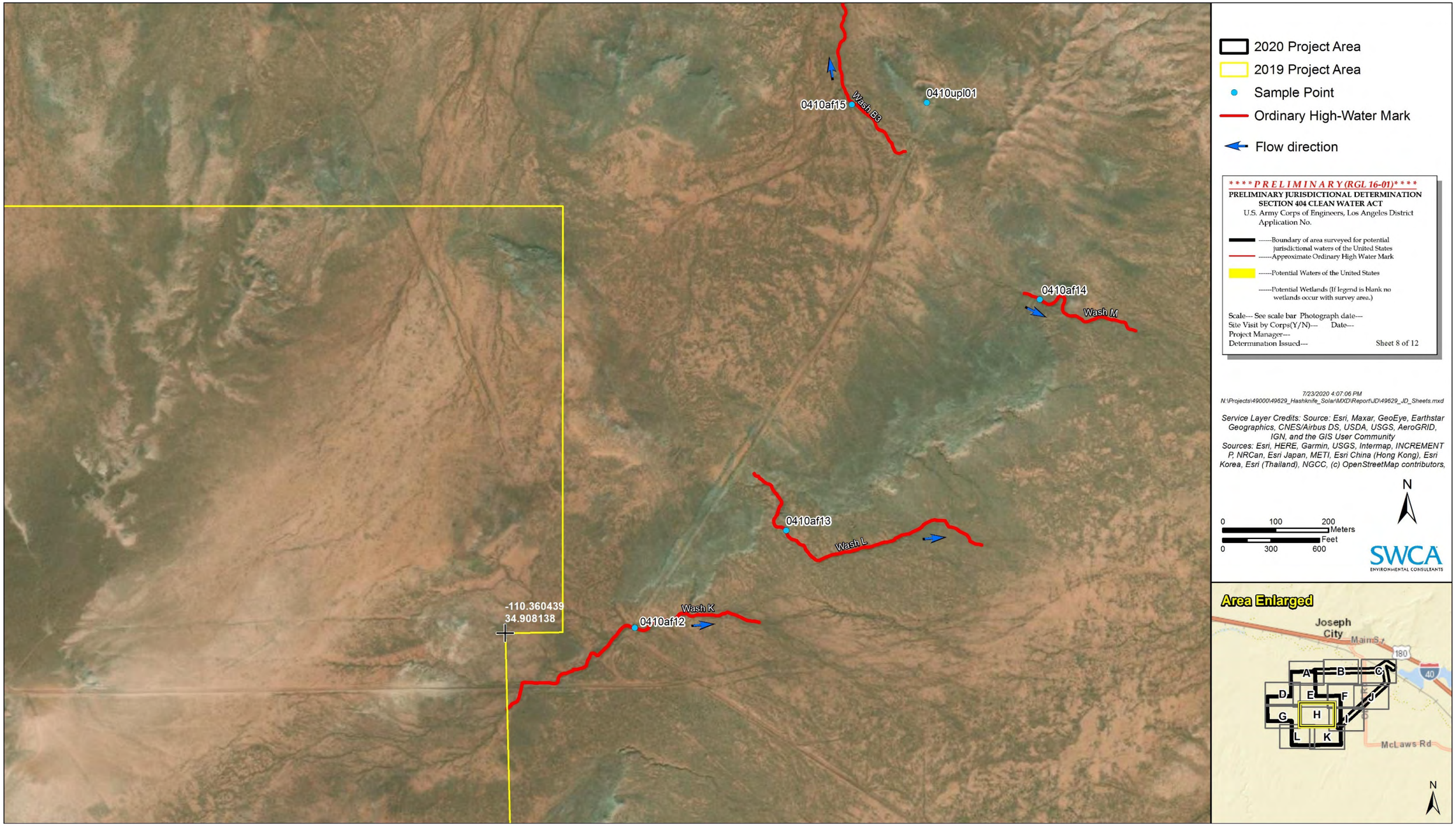


Figure 2H. Hashknife Energy Center Project Wetlands and Other Waters of the U.S.

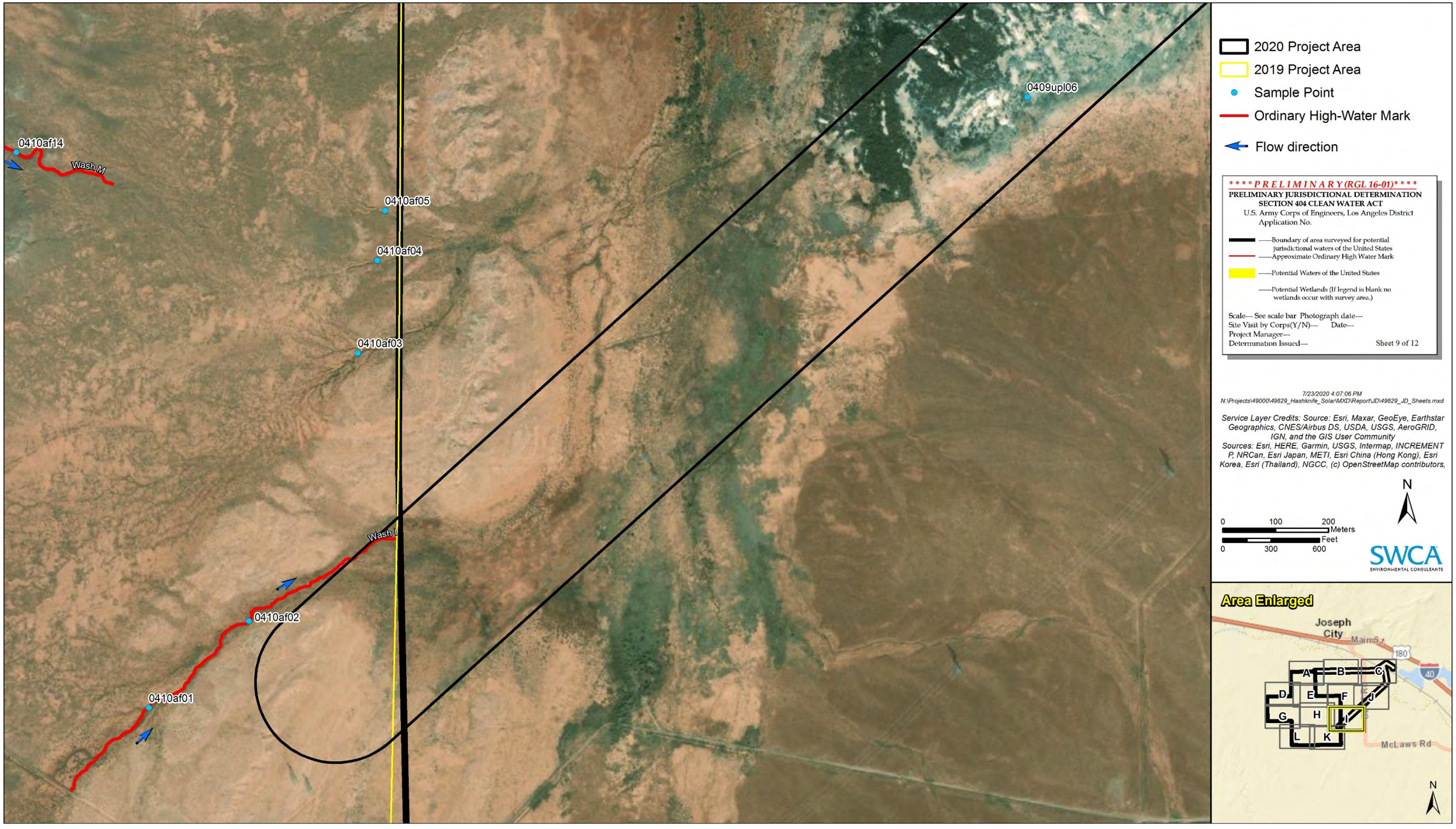


Figure 2I. Hashknife Energy Center Project Wetlands and Other Waters of the U.S.

Figure 2J. Hashknife Energy Center Project Wetlands and Other Waters of the U.S.

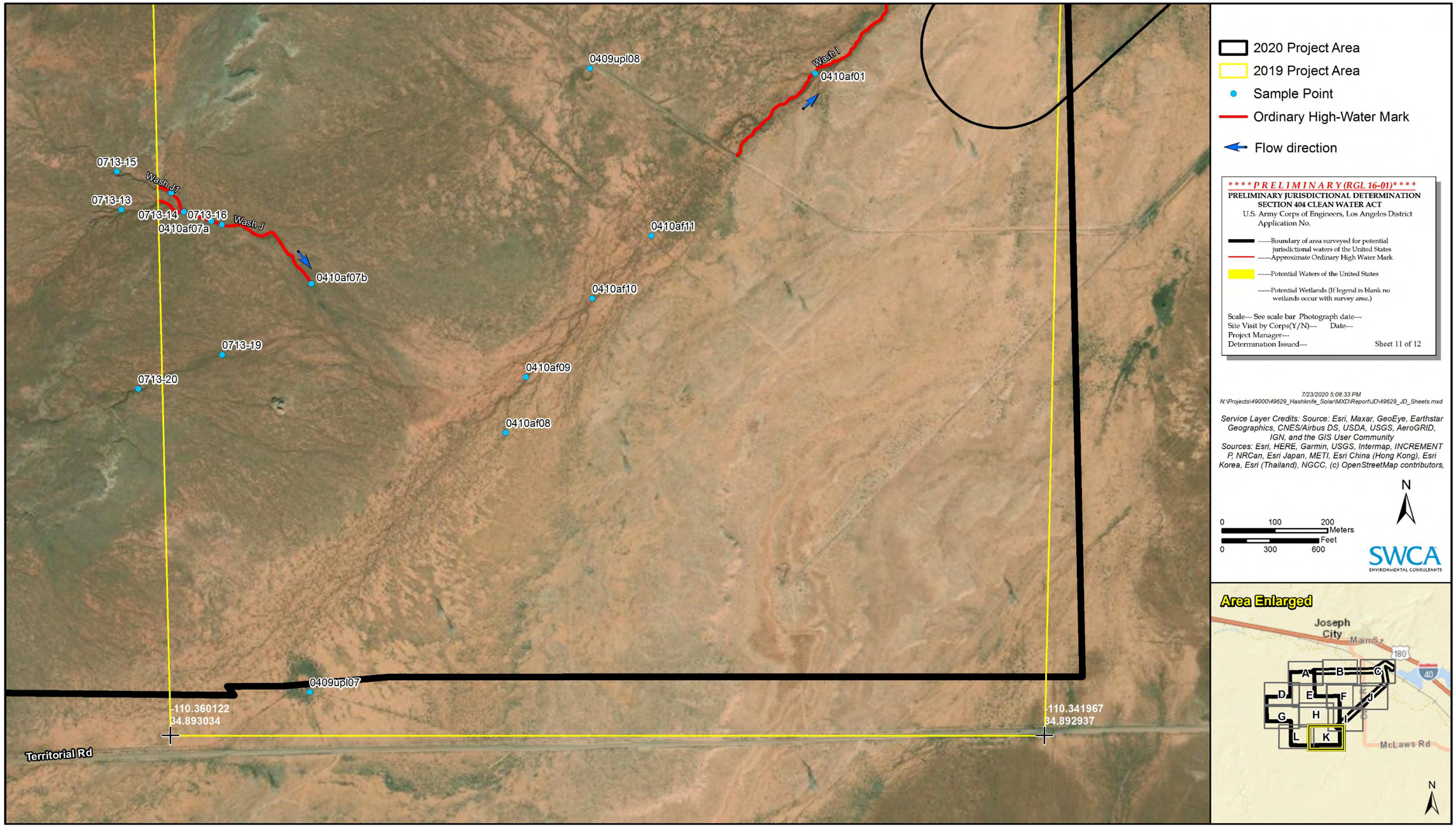


Figure 2K. Hashknife Energy Center Project Wetlands and Other Waters of the U.S.

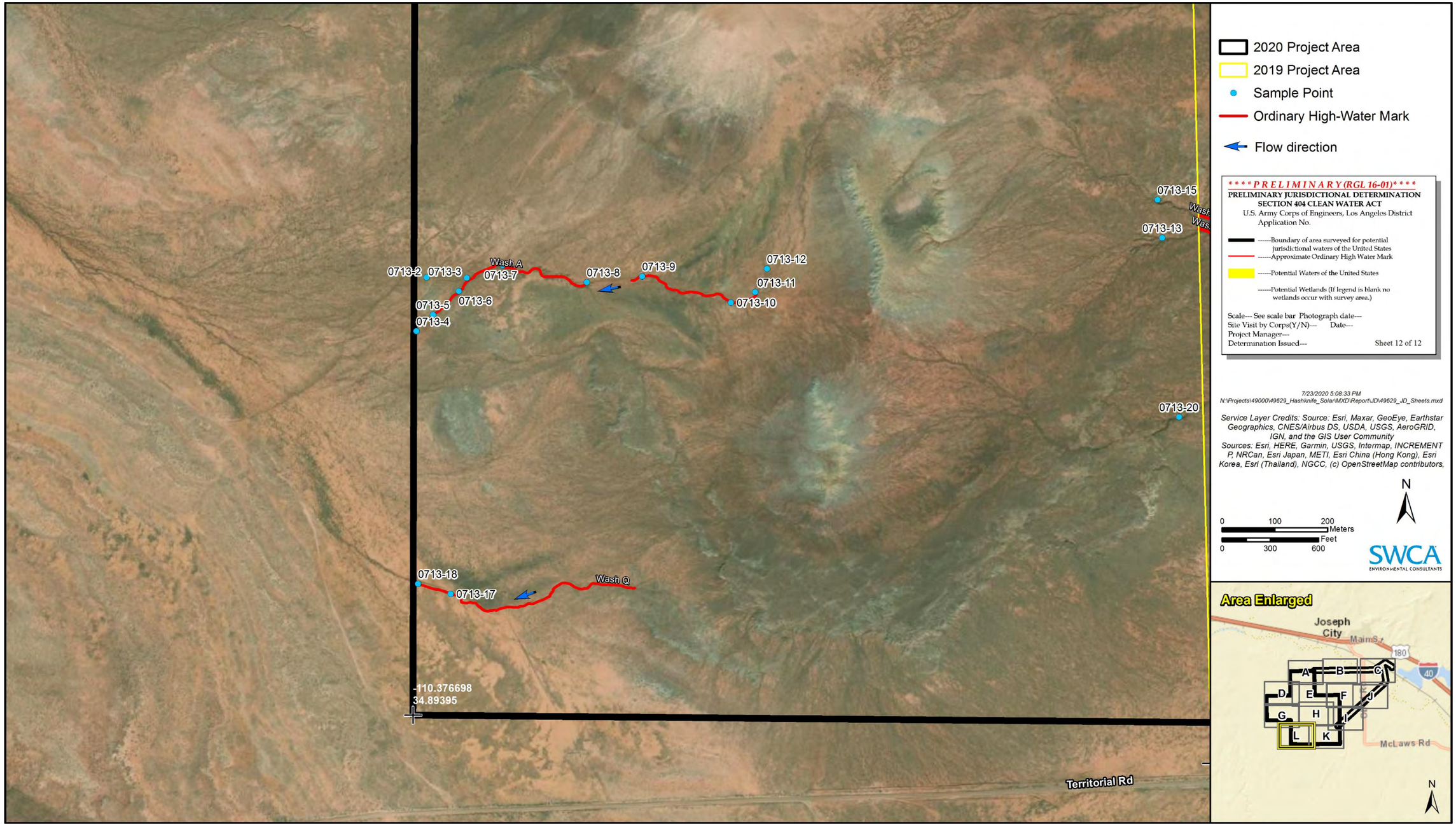


Figure 2L. Hashknife Energy Center Project Wetlands and Other Waters of the U.S.

APPENDIX B

Wetland Determination Data Forms – Arid West Region

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Hashknife Solar County: Navajo Sampling Date: April 9, 2019
Applicant/Owner: Invenergy State: Arizona Sampling Point: 0409upl01
Investigator(s): A. Fischer and 0 Section, Township, Range: S26, T18N, R19E
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR): D Lat: 34.934432 Long: -110.303182 Datum: NAD 83
Soil Map Unit Name: Ives fine sandy loam, wet, 0 to 1 percent slopes NWI classification: R4SBA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes **X** No _____ (If no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No _____
Are Vegetation **No**, Soil **No**, or Hydrology **No** naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No **X**
Hydric Soil Present? Yes _____ No **X**
Wetland Hydrology Present? Yes **X** No _____

Is the Sampled Area within a Wetland? **Yes** _____ **No** **X**

Remarks:
This point was determined not to be within a wetland due to the lack of hydrophytic vegetation and hydric soils.

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *Salix exigua*	2	No	FACW
2.			
3.			
4.			
5.			
2 = Total Cover			
Herb Stratum (Plot size: 5 ft.)			
1. *Salsola tragus*	20	Yes	FACU
2. *Ericameria nauseosa*	15	Yes	UPL
3. *Xanthium spinosum*	2	No	FACU
4. *Sporobolus cryptandrus*	2	No	FACU
5. *Phemeranthus calycinus*	2	No	UPL
6.			
7.			
8.			
41 = Total Cover			
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 59 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)

Total Number of Dominant Species Across All Strata: **2** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**2**	x 2 =	**4**
FAC species	**0**	x 3 =	**0**
FACU species	**24**	x 4 =	**96**
UPL species	**17**	x 5 =	**85**
Column Totals:	**43** (A)		**185** (B)

Prevalence Index = B/A = **4.30**

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** **X**

Remarks:
No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FACU or drier).

SOIL

Sampling Point: **0409upl01**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	10YR 4/3	100	None	—	—	—	Fine Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) **(LRR C)**
- ____ 1 cm Muck (A9) **(LRR D)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR C)**
- ____ 2 cm Muck (A10) **(LRR B)**
- ____ Reduced Vertic (F18)
- ____ Red Parent Material (TF2)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth(inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- **X** Saturation (A3)
- ____ Water Marks (B1) **(Nonriverine)**
- ____ Sediment Deposits (B2) **(Nonriverine)**
- ____ Drift Deposits (B3) **(Nonriverine)**
- **X** Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres along Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) **(Riverine)**
- **X** Sediment Deposits (B2) **(Riverine)**
- **X** Drift Deposits (B3) **(Riverine)**
- **X** Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No **X** Depth (inches): **N/A**

Water Table Present? Yes _____ No **X** Depth (inches): **>20**

Saturation Present? (includes capillary fringe) Yes **X** No _____ Depth (inches): **12**

Wetland Hydrology Present? **Yes** **X** **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Hashknife Solar County: Navajo Sampling Date: April 9, 2019
Applicant/Owner: Invenergy State: Arizona Sampling Point: 0409wet02
Investigator(s): A. Fischer and 0 Section, Township, Range: S22, T18N, R19E
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR): D Lat: 34.938227 Long: -110.316540 Datum: NAD 83
Soil Map Unit Name: Tours clay loam, saline-sodic, 0 to 1 percent slopes NWI classification: PSS2J
Are climatic / hydrologic conditions on the site typical for this time of year? Yes **X** No _____ (If no, explain in Remarks.)
Are Vegetation **No** ,Soil **No** ,or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No _____
Are Vegetation **No** ,Soil **Yes** ,or Hydrology **No** naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes **X** No _____
Hydric Soil Present? Yes **X** No _____
Wetland Hydrology Present? Yes **X** No _____

Is the Sampled Area within a Wetland? **Yes** **X** **No** _____

Remarks:
This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

Soils are considered naturally problematic (see Remarks Section in Soils)

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *Salix exigua*	50	Yes	FACW
2. *Tamarix chinensis*	5	No	FAC
3.			
4.			
5.			
55 = Total Cover			
Herb Stratum (Plot size: 5 ft.)			
1. *Chorispora tenella*	10	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
10 = Total Cover			
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 90 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

Total Number of Dominant Species Across All Strata: **2** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **50%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**50**	x 2 =	**100**
FAC species	**5**	x 3 =	**15**
FACU species	**0**	x 4 =	**0**
UPL species	**10**	x 5 =	**50**
Column Totals:	**65** (A)		**165** (B)

Prevalence Index = B/A = **2.54**

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%
X Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **X** **No** _____

Remarks:
A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.0).

SOIL

Sampling Point: **0409wet02**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/2	33					Sandy Clay Loam	
0-16	10YR 4/4	33					Sandy Clay Loam	
0-16	5YR 3/4	33					Sandy Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- **X** Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth(inches): _____

Hydric Soil Present? **Yes X No** _____

Remarks:

A positive indication of hydric soil was observed.

Fluvial soils, likely haven't developed hydric indicators but will do so over time. Soils are assumed hydric due to hydrophytic vegetation and hydrology indicators

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- **X** Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- **X** Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No **X** Depth (inches): **N/A**

Water Table Present? Yes _____ No **X** Depth (inches): **>20**

Saturation Present? (includes capillary fringe) Yes _____ No **X** Depth (inches): **>20**

Wetland Hydrology Present? **Yes X No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Hashknife Solar County: Navajo Sampling Date: April 9, 2019
Applicant/Owner: Invenergy State: Arizona Sampling Point: 0409upl03
Investigator(s): A. Fischer and 0 Section, Township, Range: S22, T18N, R19E
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR): D Lat: 34.938167 Long: -110.316370 Datum: NAD 83
Soil Map Unit Name: Tours clay loam, saline-sodic, 0 to 1 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area**	
Hydric Soil Present?	Yes ____	No **X**	**within a Wetland?**	**Yes** ____ **No** **X**
Wetland Hydrology Present?	Yes ____	No **X**		

Remarks:
This point was determined not to be within a wetland due to the lack of all three wetland criteria.

VEGETATION - Use scientific names of plants.

	Absolute	Dominant	Indicator
Tree Stratum (Plot size: 30 ft.)	% cover	Species?	Status
1. *None Observed*			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *Tamarix chinensis*	20	Yes	FAC
2.			
3.			
4.			
5.			
	20 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Descurainia pinnata*	40	Yes	UPL
2. *Ericameria nauseosa*	15	Yes	UPL
3. *Sporobolus giganteus*	10	No	FACU
4. *Phacelia crenulata*	5	No	UPL
5. *Cryptantha crassisepala*	2	No	UPL
6.			
7.			
8.			
	72 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 28 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

Total Number of Dominant Species Across All Strata: **3** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **33%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**20**	x 3 =	**60**
FACU species	**10**	x 4 =	**40**
UPL species	**62**	x 5 =	**310**
Column Totals:	**92** (A)		**410** (B)

Prevalence Index = B/A = **4.46**

Hydrophytic Vegetation Indicators:

____ Dominance Test is >50%
____ Prevalence Index is ≤3.0[1]
____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks:
No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FACU or drier).

SOIL

Sampling Point: **0409upl03**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	10YR 5/3	100	None	—	—	—	Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) **(LRR C)**
- ____ 1 cm Muck (A9) **(LRR D)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR C)**
- ____ 2 cm Muck (A10) **(LRR B)**
- ____ Reduced Vertic (F18)
- ____ Red Parent Material (TF2)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth(inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1) **(Nonriverine)**
- ____ Sediment Deposits (B2) **(Nonriverine)**
- ____ Drift Deposits (B3) **(Nonriverine)**
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres along Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) **(Riverine)**
- ____ Sediment Deposits (B2) **(Riverine)**
- ____ Drift Deposits (B3) **(Riverine)**
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No **X** Depth (inches): **N/A**

Water Table Present? Yes _____ No **X** Depth (inches): **>20**

Saturation Present? (includes capillary fringe) Yes _____ No **X** Depth (inches): **>20**

Wetland Hydrology Present? **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Hashknife Solar County: Navajo Sampling Date: April 9, 2019
Applicant/Owner: Invenergy State: Arizona Sampling Point: 0409upl04
Investigator(s): A. Fischer and 0 Section, Township, Range: S22, T18N, R19E
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR): D Lat: 34.938334 Long: -110.319839 Datum: NAD 83
Soil Map Unit Name: Tours clay loam, saline-sodic, 0 to 1 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation **No** ,Soil **No** ,or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No** ,Soil **No** ,or Hydrology **No** naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes **X** No ____
Hydric Soil Present? Yes ____ No **X**
Wetland Hydrology Present? Yes ____ No **X**

Is the Sampled Area within a Wetland? **Yes** ____ **No** **X**

Remarks:
This point was determined not to be within a wetland due to the lack of hydric soils and wetland hydrology.

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *Salix exigua*	60	Yes	FACW
2. *Tamarix chinensis*	5	No	FAC
3.			
4.			
5.			
	65 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Descurainia pinnata*	15	Yes	UPL
2. *Sporobolus giganteus*	5	Yes	FACU
3. *Phacelia crenulata*	5	Yes	UPL
4. *Alhagi maurorum*	5	Yes	FAC
5.			
6.			
7.			
8.			
	30 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 70 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **2** (A)

Total Number of Dominant Species Across All Strata: **5** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **40%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**60**	x 2 =	**120**
FAC species	**10**	x 3 =	**30**
FACU species	**5**	x 4 =	**20**
UPL species	**20**	x 5 =	**100**
Column Totals:	**95** (A)		**270** (B)

Prevalence Index = B/A = **2.84**

Hydrophytic Vegetation Indicators:

____ Dominance Test is >50%
X Prevalence Index is ≤3.0[1]
____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **X** **No** ____

Remarks:
A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.0).

SOIL

Sampling Point: **0409upl04**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	10YR 5/3	100	None	—	—	—	Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) **(LRR C)**
- ____ 1 cm Muck (A9) **(LRR D)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR C)**
- ____ 2 cm Muck (A10) **(LRR B)**
- ____ Reduced Vertic (F18)
- ____ Red Parent Material (TF2)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth(inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1) **(Nonriverine)**
- ____ Sediment Deposits (B2) **(Nonriverine)**
- ____ Drift Deposits (B3) **(Nonriverine)**
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres along Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) **(Riverine)**
- ____ Sediment Deposits (B2) **(Riverine)**
- ____ Drift Deposits (B3) **(Riverine)**
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No **X** Depth (inches): **N/A**

Water Table Present? Yes _____ No **X** Depth (inches): **>20**

Saturation Present? (includes capillary fringe) Yes _____ No **X** Depth (inches): **>20**

Wetland Hydrology Present? **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Hashknife Solar County: Navajo Sampling Date: April 9, 2019
Applicant/Owner: Invenergy State: Arizona Sampling Point: 0409upl05
Investigator(s): A. Fischer and 0 Section, Township, Range: S26, T18N, R19E
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR): D Lat: 34.933084 Long: -110.304665 Datum: NAD 83
Soil Map Unit Name: Ives fine sandy loam, wet, 0 to 1 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes No X
Hydric Soil Present? Yes No X
Wetland Hydrology Present? Yes No X

Is the Sampled Area within a Wetland? Yes No X

Remarks:
This point was determined not to be within a wetland due to the lack of all three wetland criteria.

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *Tamarix chinensis*	35	Yes	FAC
2. *Atriplex canescens*	10	Yes	UPL
3.			
4.			
5.			
	45 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Descurainia pinnata*	50	Yes	UPL
2. *Salsola tragus*	20	Yes	FACU
3. *Alhagi maurorum*	5	No	FAC
4.			
5.			
6.			
7.			
8.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 25 % Cover of Biotic Crust

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

Total Number of Dominant Species Across All Strata: **4** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **25%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**40**	x 3 =	**120**
FACU species	**20**	x 4 =	**80**
UPL species	**60**	x 5 =	**300**
Column Totals:	**120** (A)		**500** (B)

Prevalence Index = B/A = **4.17**

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No X

Remarks:
No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FACU or drier).

SOIL

Sampling Point: **0409upl05**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	10YR 4/3	100	None	—	—	—	Fine Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) **(LRR C)**
- ____ 1 cm Muck (A9) **(LRR D)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR C)**
- ____ 2 cm Muck (A10) **(LRR B)**
- ____ Reduced Vertic (F18)
- ____ Red Parent Material (TF2)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth(inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1) **(Nonriverine)**
- ____ Sediment Deposits (B2) **(Nonriverine)**
- ____ Drift Deposits (B3) **(Nonriverine)**
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres along Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) **(Riverine)**
- ____ Sediment Deposits (B2) **(Riverine)**
- ____ Drift Deposits (B3) **(Riverine)**
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No **X** Depth (inches): **N/A**

Water Table Present? Yes _____ No **X** Depth (inches): **>20**

Saturation Present? (includes capillary fringe) Yes _____ No **X** Depth (inches): **>20**

Wetland Hydrology Present? **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Hashknife Solar County: Navajo Sampling Date: April 9, 2019
Applicant/Owner: Invenergy State: Arizona Sampling Point: 0409upl06
Investigator(s): A. Fischer and 0 Section, Township, Range: S33, T18N, R19E
Landform (hillslope, terrace, etc.): Meadow Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR): D Lat: 34.914603 Long: -110.328354 Datum: NAD 83
Soil Map Unit Name: Medisaprists, saline, 0 to 1 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area**	
Hydric Soil Present?	Yes ____	No **X**	**within a Wetland?**	**Yes** ____ **No** **X**
Wetland Hydrology Present?	Yes ____	No **X**		

Remarks:
This point was determined not to be within a wetland due to the lack of hydric soils and wetland hydrology.

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *Tamarix chinensis*	10	Yes	FAC
2.			
3.			
4.			
5.			
10 = Total Cover			
Herb Stratum (Plot size: 5 ft.)			
1. *Alhagi maurorum*	5	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
5 = Total Cover			
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 95 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **2** (A)

Total Number of Dominant Species Across All Strata: **2** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**15**	x 3 =	**45**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**15** (A)		**45** (B)

Prevalence Index = B/A = **3.00**

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%
X Prevalence Index is ≤3.0[1]
____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **X** **No** ____

Remarks:
A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).
A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.0).

SOIL

Sampling Point: **0409upl06**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	10YR 3/1	100	None	—	—	—	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) **(LRR C)**
- ____ 1 cm Muck (A9) **(LRR D)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR C)**
- ____ 2 cm Muck (A10) **(LRR B)**
- ____ Reduced Vertic (F18)
- ____ Red Parent Material (TF2)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth(inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1) **(Nonriverine)**
- ____ Sediment Deposits (B2) **(Nonriverine)**
- ____ Drift Deposits (B3) **(Nonriverine)**
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres along Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) **(Riverine)**
- ____ Sediment Deposits (B2) **(Riverine)**
- ____ Drift Deposits (B3) **(Riverine)**
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No **X** Depth (inches): **N/A**

Water Table Present? Yes _____ No **X** Depth (inches): **>20**

Saturation Present? (includes capillary fringe) Yes _____ No **X** Depth (inches): **>20**

Wetland Hydrology Present? **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Hashknife Solar County: Navajo Sampling Date: April 9, 2019
Applicant/Owner: Invenergy State: Arizona Sampling Point: 0409upl07
Investigator(s): A. Fischer and 0 Section, Township, Range: S05, T17N, R19E
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0
Subregion (LRR): D Lat: 34.893759 Long: -110.357215 Datum: NAD 83
Soil Map Unit Name: Purgatory fine sandy loam, 1 to 8 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No **X**	
Hydric Soil Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:
This point was determined not to be within a wetland due to the lack of hydrophytic vegetation and hydric soils.

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *Tamarix chinensis*	10	Yes	FAC
2.			
3.			
4.			
5.			
	10 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Sporobolus cryptandrus*	50	Yes	FACU
2. *Atriplex canescens*	20	Yes	UPL
3. *Alhagi maurorum*	5	No	FAC
4.			
5.			
6.			
7.			
8.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 25 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

Total Number of Dominant Species Across All Strata: **3** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **33%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**15**	x 3 =	**45**
FACU species	**50**	x 4 =	**200**
UPL species	**20**	x 5 =	**100**
Column Totals:	**85** (A)		**345** (B)

Prevalence Index = B/A = **4.06**

Hydrophytic Vegetation Indicators:

____ Dominance Test is >50%
____ Prevalence Index is ≤3.0[1]
____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **X**

Remarks:
No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FACU or drier).

SOIL

Sampling Point: **0409upl07**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	7.5YR 4/4	100	None	—	—	—	Fine Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) **(LRR C)**
- ____ 1 cm Muck (A9) **(LRR D)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR C)**
- ____ 2 cm Muck (A10) **(LRR B)**
- ____ Reduced Vertic (F18)
- ____ Red Parent Material (TF2)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth(inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1) **(Nonriverine)**
- ____ Sediment Deposits (B2) **(Nonriverine)**
- ____ Drift Deposits (B3) **(Nonriverine)**
- **X** Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres along Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) **(Riverine)**
- ____ Sediment Deposits (B2) **(Riverine)**
- ____ Drift Deposits (B3) **(Riverine)**
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No **X** Depth (inches): **N/A**

Water Table Present? Yes _____ No **X** Depth (inches): **>20**

Saturation Present? (includes capillary fringe) Yes _____ No **X** Depth (inches): **>20**

Wetland Hydrology Present? **Yes** **X** **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Hashknife Solar County: Navajo Sampling Date: April 9, 2019
Applicant/Owner: Invenergy State: Arizona Sampling Point: 0409upl08
Investigator(s): A. Fischer and 0 Section, Township, Range: S05, T17N, R19E
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0
Subregion (LRR): D Lat: 34.904387 Long: -110.351315 Datum: NAD 83
Soil Map Unit Name: Penzance-Grieta complex, 0 to 5 percent slopes NWI classification: PUSCh
Are climatic / hydrologic conditions on the site typical for this time of year? Yes **X** No _____ (If no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No _____
Are Vegetation **No**, Soil **No**, or Hydrology **No** naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No **X**
Hydric Soil Present? Yes _____ No **X**
Wetland Hydrology Present? Yes **X** No _____

Is the Sampled Area within a Wetland? **Yes** _____ **No** **X**

Remarks:
This point was determined not to be within a wetland due to the lack of hydrophytic vegetation and hydric soils.

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *Tamarix chinensis*	2	No	FAC
2.			
3.			
4.			
5.			
2 = Total Cover			
Herb Stratum (Plot size: 5 ft.)			
1. *Sporobolus giganteus*	20	Yes	FACU
2. *Alhagi maurorum*	10	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
30 = Total Cover			
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 70 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

Total Number of Dominant Species Across All Strata: **2** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **50%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**12**	x 3 =	**36**
FACU species	**20**	x 4 =	**80**
UPL species	**0**	x 5 =	**0**
Column Totals:	**32** (A)		**116** (B)

Prevalence Index = B/A = **3.63**

Hydrophytic Vegetation Indicators:

____ Dominance Test is >50%
____ Prevalence Index is ≤3.0[1]
____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** **X**

Remarks:
No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FACU or drier).

SOIL

Sampling Point: **0409upl08**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	10YR 4/3	100	None	—	—	—	Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) **(LRR C)**
- ____ 1 cm Muck (A9) **(LRR D)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR C)**
- ____ 2 cm Muck (A10) **(LRR B)**
- ____ Reduced Vertic (F18)
- ____ Red Parent Material (TF2)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth(inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1) **(Nonriverine)**
- ____ Sediment Deposits (B2) **(Nonriverine)**
- ____ Drift Deposits (B3) **(Nonriverine)**
- **X** Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres along Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) **(Riverine)**
- ____ Sediment Deposits (B2) **(Riverine)**
- ____ Drift Deposits (B3) **(Riverine)**
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No **X** Depth (inches): **N/A**

Water Table Present? Yes _____ No **X** Depth (inches): **>20**

Saturation Present? (includes capillary fringe) Yes _____ No **X** Depth (inches): **>20**

Wetland Hydrology Present? **Yes** **X** **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Hashknife Solar County: Navajo Sampling Date: April 10, 2019
Applicant/Owner: Invenergy State: Arizona Sampling Point: 0410upl01
Investigator(s): A. Fischer and 0 Section, Township, Range: S32, T18N, R19E
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0
Subregion (LRR): D Lat: 34.917142 Long: -110.351623 Datum: NAD 83
Soil Map Unit Name: Epikom channery sandy loam, 1 to 12 percent slopes NWI classification: PUSAh
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No
Hydric Soil Present? Yes No X
Wetland Hydrology Present? Yes No X

Is the Sampled Area within a Wetland? Yes No X

Remarks:
This point was determined not to be within a wetland due to the lack of hydric soils and wetland hydrology.

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *Tamarix chinensis*	2	No	FAC
2.			
3.			
4.			
5.			
	2 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Phragmites australis*	20	Yes	FACW
2. *Alhagi maurorum*	5	No	FAC
3. *Atriplex canescens*	5	No	UPL
4.			
5.			
6.			
7.			
8.			
	30 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 70 % Cover of Biotic Crust

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	7	x 3 =	21
FACU species	0	x 4 =	0
UPL species	5	x 5 =	25
Column Totals:	32 (A)		86 (B)

Prevalence Index = B/A = 2.69

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%
X Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No

Remarks:
A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).
A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.0).

Sampling Point: **0410upl01**

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 4/4	100	None	—	—	—	Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) **(LRR C)**
- ____ 1 cm Muck (A9) **(LRR D)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR C)**
- ____ 2 cm Muck (A10) **(LRR B)**
- ____ Reduced Vertic (F18)
- ____ Red Parent Material (TF2)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth(inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1) **(Nonriverine)**
- ____ Sediment Deposits (B2) **(Nonriverine)**
- ____ Drift Deposits (B3) **(Nonriverine)**
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres along Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) **(Riverine)**
- ____ Sediment Deposits (B2) **(Riverine)**
- ____ Drift Deposits (B3) **(Riverine)**
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- **X** FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No **X** Depth (inches): **N/A**

Water Table Present? Yes _____ No **X** Depth (inches): **>20**

Saturation Present? (includes capillary fringe) Yes _____ No **X** Depth (inches): **>20**

Wetland Hydrology Present? **Yes** _____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

APPENDIX C

Representative Site Photographs
(Photograph numbers keyed to Figures 2A–2L in Appendix B)

Photograph 1. Feature 0409af01. Upstream view of the Little Colorado River. Photo orientation south. See Figure 2C. Old alignment crossing.

Photograph 2. Feature 0409af01. Downstream view of the Little Colorado River. Photo orientation northwest. See Figure 2C. Old alignment crossing.

Photograph 3. Feature 0409af02. Upstream view of Tanner Wash. Photo orientation east. See Figure 2C.

Photograph 4. Feature 0409af02. Downstream view of Tanner Wash. Photo orientation west. See Figure 2C.

Photograph 5. Feature 0409af03. Upstream view of the Little Colorado River. Photo orientation southwest. See Figure 2C.

Photograph 6. Feature 0409af03. Downstream view of the Little Colorado River. Photo orientation northwest. See Figure 2C.

Photograph 7. Feature 0409af04. Upgradient view of drainage. Photo orientation southeast. See Figure 2G.

Photograph 8. Feature 0409af04. Downgradient view of drainage. Photo orientation northwest. See Figure 2G.

Photograph 9. Feature 0409af05. Upgradient view of drainage. Photo orientation south. See Figure 2B.

Photograph 10. Feature 0409af05. Downgradient view of drainage. Photo orientation north. See Figure 2B.

Photograph 11. Feature 0409af06. Upgradient view of drainage. Photo orientation south. See Figure 2A.

Photograph 12. Feature 0409af06. Downgradient view of drainage. Photo orientation north. See Figure 2A.

Photograph 13. Feature 0409af07. Upgradient view of drainage. Photo orientation southwest. See Figure 2A.

Photograph 14. Feature 0409af07. Downgradient view of drainage. Photo orientation northeast. See Figure 2A.

Photograph 15. Feature 0409af08. Upgradient view of drainage. Photo orientation southwest. See Figure 2A.

Photograph 16. Feature 0409af08. Downgradient view of drainage. Photo orientation northeast. See Figure 2A.

Photograph 17. Feature 0409af09. Upgradient view of drainage. Photo orientation west. See Figure 2E.

Photograph 18. Feature 0409af09. Downgradient view of drainage. Photo orientation east. See Figure 2E.

Photograph 19. Feature 0409ca01. Upgradient view of drainage. Photo orientation east. See Figure 2G.

Photograph 20. Feature 0409ca01. Downgradient view of drainage. Photo orientation west. See Figure 2G.

Photograph 21. Feature 0409ca02. Upgradient view of drainage. Photo orientation southwest. See Figure 2E.

Photograph 22. Feature 0409ca02. Downgradient view of drainage. Photo orientation northeast. See Figure 2E.

Photograph 23. Feature 0409ca03. Upgradient view of drainage. Photo orientation south. See Figure 2E.

Photograph 24. Feature 0409ca03. Downgradient view of drainage. Photo orientation north. See Figure 2E.

Photograph 25. Feature 0409ca04. Upgradient view of drainage. Photo orientation south. See Figure 2E.

Photograph 26. Feature 0409ca04. Downgradient view of drainage. Photo orientation north. See Figure 2E.

Photograph 27. Feature 0409ca05. Upgradient view of drainage. Photo orientation east. See Figure 2A.

Photograph 28. Feature 0409ca05. Downgradient view of drainage. Photo orientation west. See Figure 2A.

Photograph 29. Feature 0409ca06. Upgradient view of drainage. Photo orientation south. See Figure 2A.

Photograph 30. Feature 0409ca06. Downgradient view of drainage. Photo orientation north. See Figure 2A.

Photograph 31. Feature 0409ca07. Upgradient view of drainage. Photo orientation southeast. See Figure 2A.

Photograph 32. Feature 0409ca07. Downgradient view of drainage. Photo orientation northwest. See Figure 2A.

Photograph 33. Feature 0409upl01. Non-wetland overbank area on east side of Little Colorado River. Photo orientation south. See Figure 2C.

Photograph 34. Feature 0409wet02. Emergent wetland overbank area on east side of Little Colorado River. Photo orientation southwest. See Figure 2C.

Photograph 35. Feature 0409upl03. Upland out-point adjacent to 0409wet02. Photo orientation south. See Figure 2C.

Photograph 36. Feature 0409upl04. Non-wetland overbank area on west side of Little Colorado River. Photo orientation west. See Figure 2C.

Photograph 37. Feature 0409upl05. Non-wetland area on south bank of Little Colorado River. Photo orientation southwest. See Figure 2C.

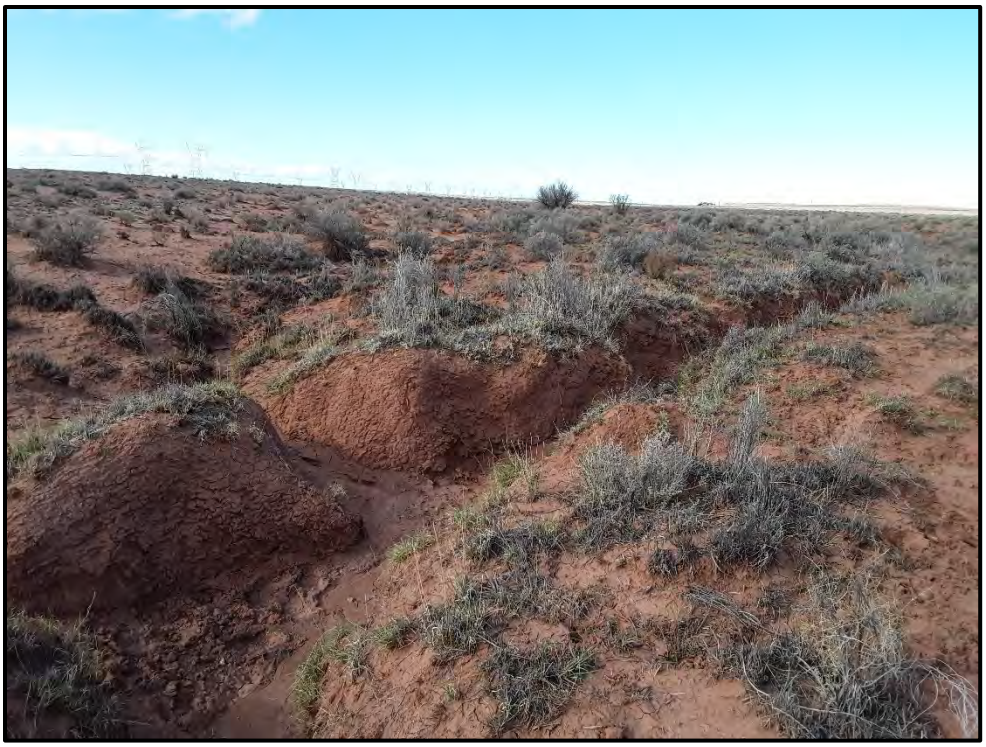
Photograph 38. Feature 0409upl06. Non-wetland area along gen-tie easement. Photo orientation northeast. See Figure 2J.

Photograph 39. Feature 0409upl07. Non-wetland dry stock pond. Photo orientation northwest. See Figure 2K.

Photograph 40. Feature 0409upl08. Non-wetland dry stock pond. Photo orientation south. See Figure 2K.

Photograph 41. Feature 0410af01. Upgradient view of drainage. Photo orientation southwest. See Figure 2I.

Photograph 42. Feature 0410af01. Downgradient view of drainage. Photo orientation northeast. See Figure 2I.

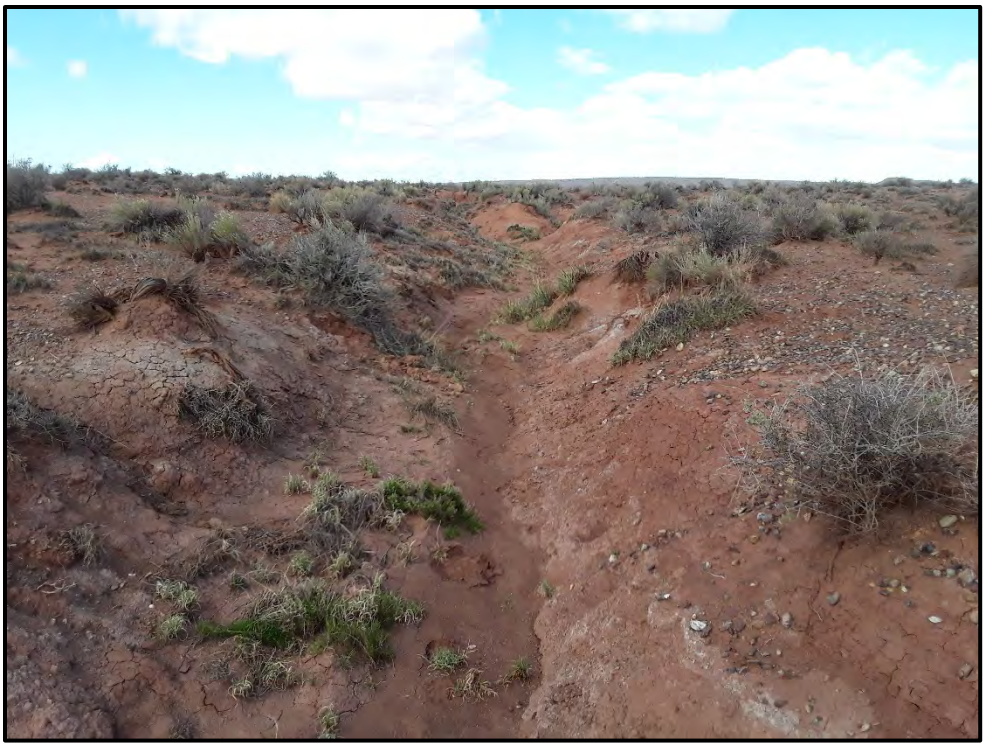


Photograph 43. Feature 0410af02. Upgradient view of drainage. Photo orientation southwest. See Figure 2I.

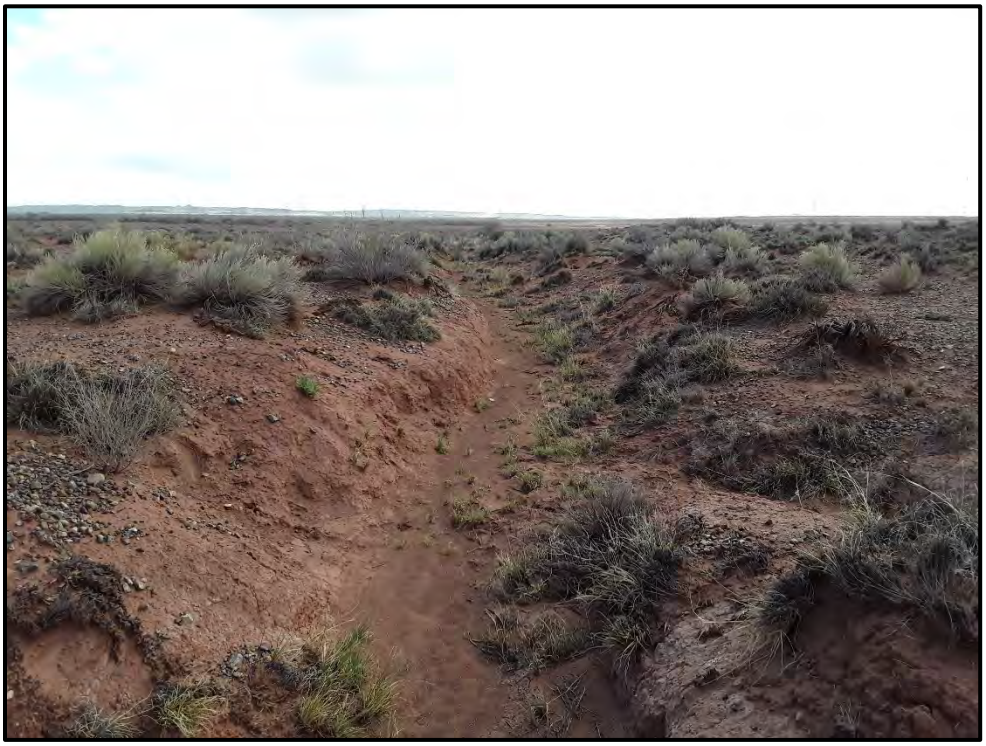
Photograph 44. Feature 0410af02. Downgradient view of drainage. Photo orientation northeast. See Figure 2I.

Photograph 45. Feature 0410af03. Upgradient view of drainage. Photo orientation southwest. See Figure 2I.

Photograph 46. Feature 0410af03. Downgradient view of drainage. Photo orientation northeast. See Figure 2I.



Photograph 47. Feature 0410af04. Upgradient view of drainage. Photo orientation west. See Figure 2I.



Photograph 48. Feature 0410af04. Downgradient view of drainage. Photo orientation east. See Figure 2I.

Photograph 49. Feature 0410af05. Upgradient view of drainage. Photo orientation west. See Figure 2I.

Photograph 50. Feature 0410af05. Downgradient view of drainage. Photo orientation east. See Figure 2I.

Photograph 51. Feature 0410af06. Upgradient view of drainage. Photo orientation west. See Figure 2L.

Photograph 52. Feature 0410af06. Downgradient view of drainage. Photo orientation east. See Figure 2L.

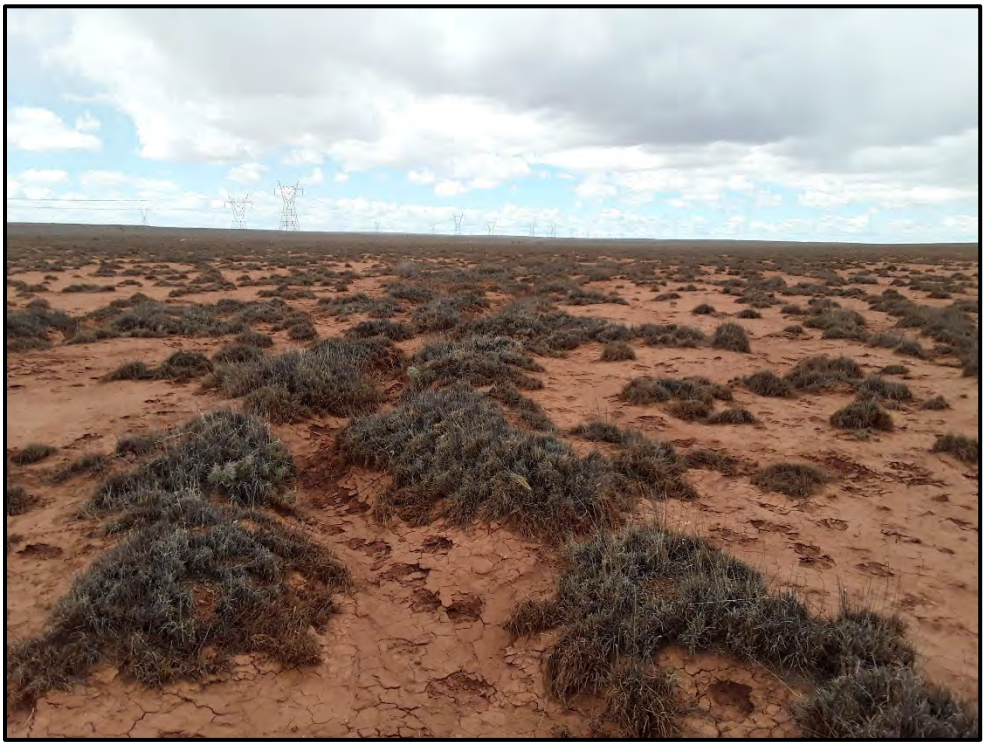
Photograph 53. Feature 0410af07a. Upgradient view of drainage. Photo orientation northwest. See Figure 2K.

Photograph 54. Feature 0410af07a. Downgradient view of drainage. Photo orientation southeast. See Figure 2K.

Photograph 55. Feature 0409af07b. Downgradient view of drainage terminus. Photo orientation southeast. See Figure 2K.

Photograph 56. Feature 0410af08. Upgradient view of drainage. Photo orientation southwest. See Figure 2K.

Photograph 57. Feature 0410af08. Downgradient view of drainage. Photo orientation northeast. See Figure 2K.



Photograph 58. Feature 0410af09. Upgradient view of drainage. Photo orientation southwest. See Figure 2K.

Photograph 59. Feature 0410af09. Downgradient view of drainage. Photo orientation northeast. See Figure 2K.

Photograph 60. Feature 0410af10. Upgradient view of drainage. Photo orientation southwest. See Figure 2K.

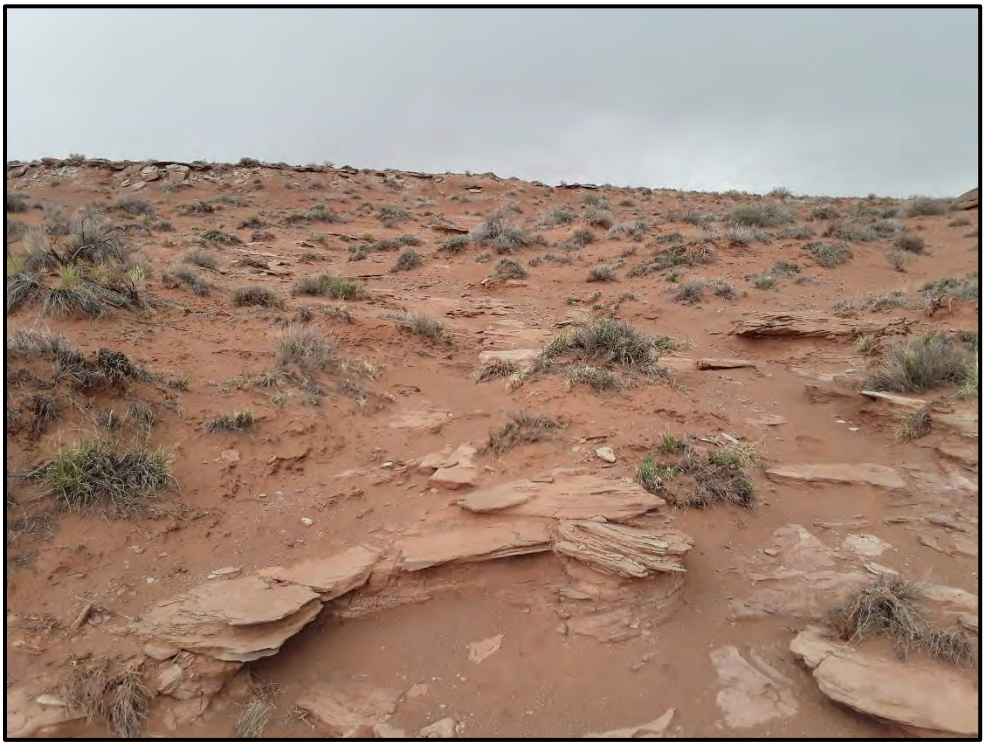
Photograph 61. Feature 0410af10. Downgradient view of drainage. Photo orientation northeast. See Figure 2K.

Photograph 62. Feature 0410af11. Upgradient view of drainage. Photo orientation southwest. See Figure 2K.

Photograph 63. Feature 0410af11. Downgradient view of drainage. Photo orientation northeast. See Figure 2K.

Photograph 64. Feature 0410af12. Upgradient view of drainage. Photo orientation northwest. See Figure 2H.

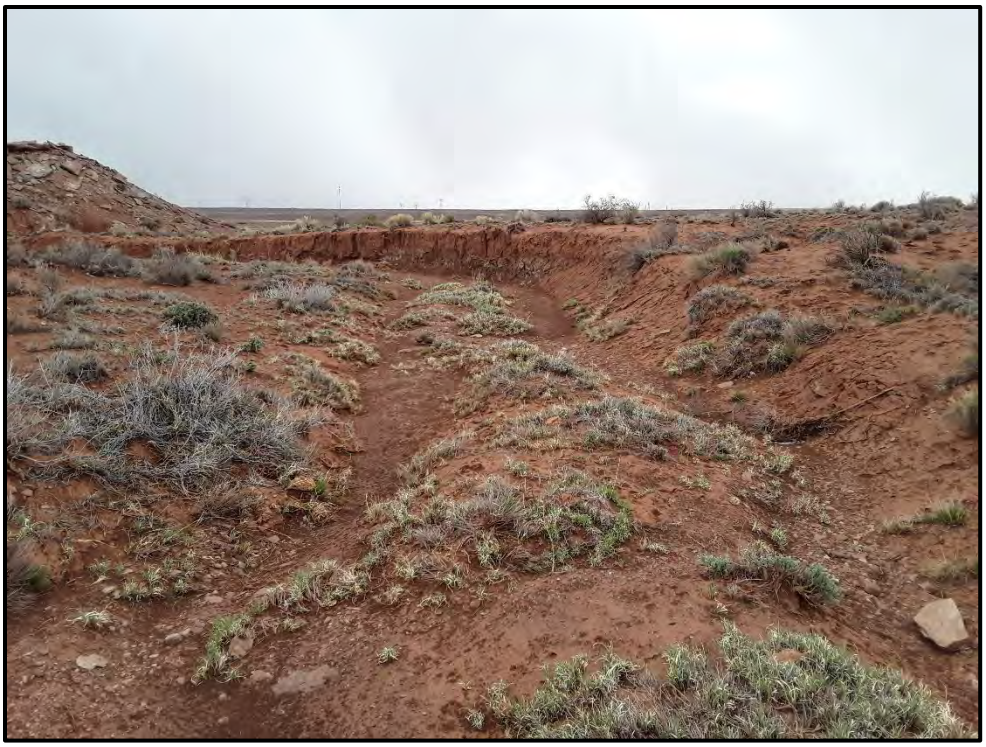
Photograph 65. Feature 0410af12. Downgradient view of drainage. Photo orientation southeast. See Figure 2H.



Photograph 66. Feature 0410af13. Upgradient view of drainage. Photo orientation northwest. See Figure 2H.

Photograph 67. Feature 0410af13. Downgradient view of drainage. Photo orientation southeast. See Figure 2H.

Photograph 68. Feature 0410af14. Upgradient view of drainage. Photo orientation northwest. See Figure 2H/I.



Photograph 69. Feature 0410af14. Downgradient view of drainage. Photo orientation southeast. See Figure 2H/I.

Photograph 70. Feature 0410af15. Upgradient view of drainage. Photo orientation southeast. See Figure 2E/H.

Photograph 71. Feature 0410af15. Downgradient view of drainage. Photo orientation northwest. See Figure 2E/H.

Photograph 72. Feature 0410af16. Upgradient view of drainage. Photo orientation south. See Figure 2F.

Photograph 73. Feature 0410af16. Downgradient view of drainage. Photo orientation north. See Figure 2F.

Photograph 74. Feature 0410af17. Upgradient view of drainage. Photo orientation west. See Figure 2F.

Photograph 75. Feature 0410af17. Downgradient view of drainage. Photo orientation northeast. See Figure 2F.

Photograph 76. Feature 0410af18. Upgradient view of drainage. Photo orientation southwest. See Figure 2F.

Photograph 77. Feature 0410af18. Downgradient view of drainage. Photo orientation northeast. See Figure 2F.

Photograph 78. Feature 0410upl01. Non-wetland dry stock pond. Photo orientation northwest. See Figure 2H.

Photograph 79. Feature 0713-1. Upstream (east) view of the Little Colorado River. See Figure 2C.

Photograph 80. Feature 0713-2. Downgradient view of drainage. See Figure 2L.

Photograph 81. Feature 0723-3. Downgradient view of drainage. See Figure 2L.

Photograph 82. Feature 0713-4. Upgradient view. See Figure 2L.

Photograph 83. Feature 0713-005. Downgradient view of drainage. See Figure 2L.

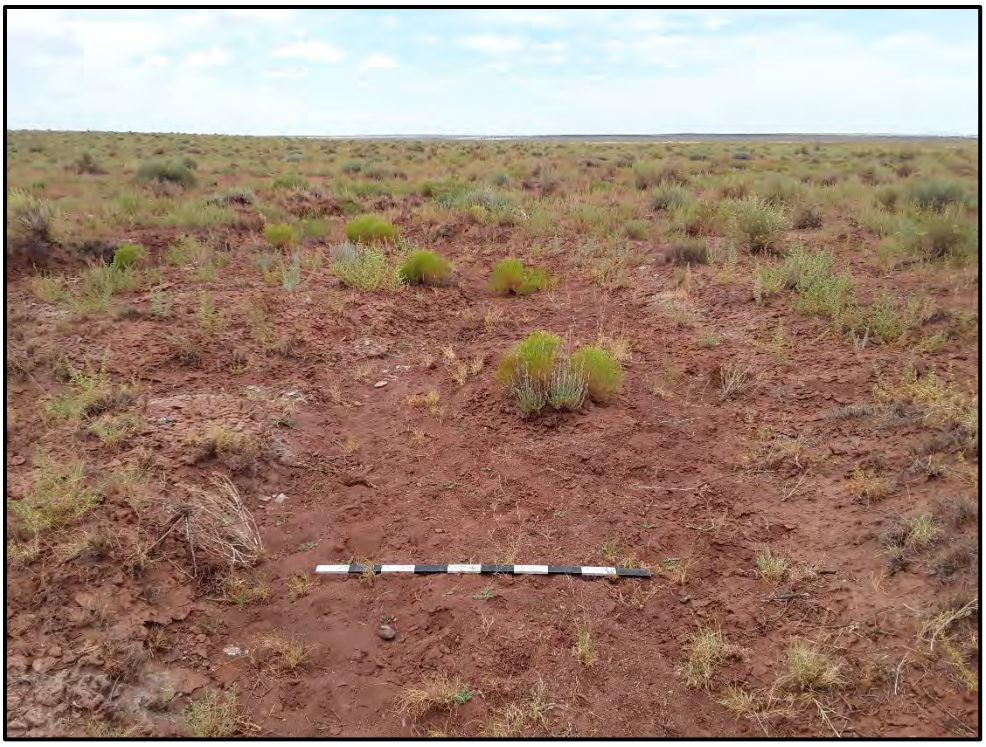
Photograph 84. Feature 0713-006. Upgradient view of drainage. See Figure 2L.

Photograph 85. Feature 0713-007. Downgradient view of drainage. See Figure 2L.

Photograph 86. Feature 0713-008. Upgradient view of drainage. See Figure 2L.

Photograph 87. Feature 0713-009. Downgradient view of drainage. See Figure 2L.

Photograph 88. Feature 0713-010. Upgradient view of drainage. See Figure 2L.



Photograph 89. Feature 0713-011. Downgradient view of drainage. See Figure 2L.

Photograph 90. Feature 0713-012. Upgradient view of drainage. See Figure 2L.

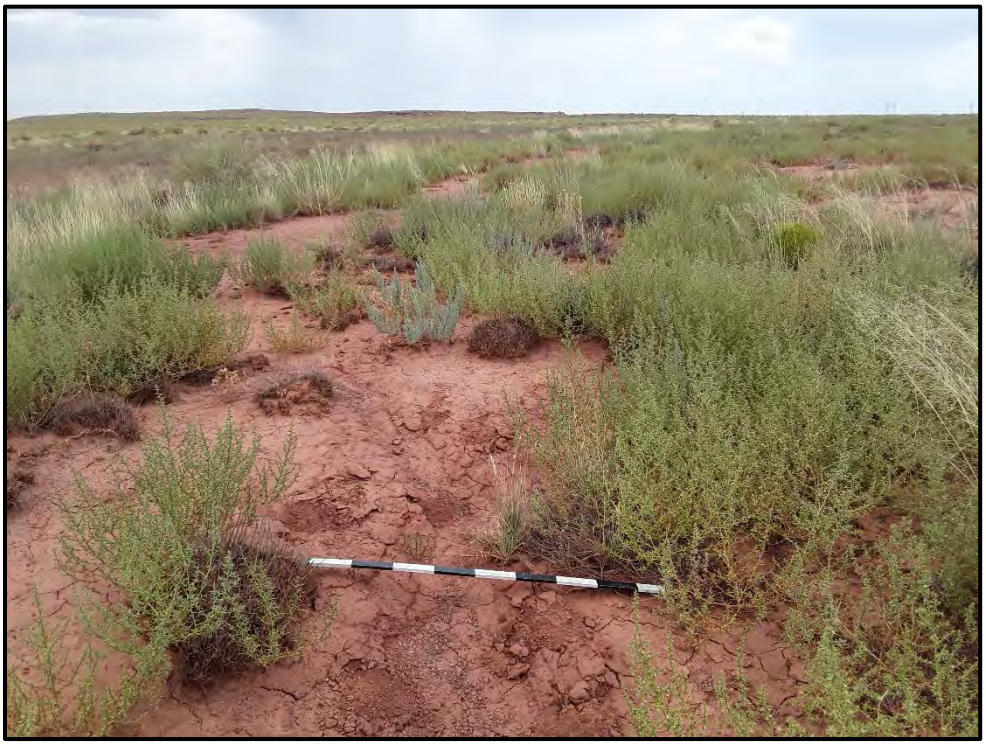
Photograph 91. Feature 0713-013. Downgradient view of drainage. See Figure 2K/L.

Photograph 92. Feature 0713-014. Upgradient view of drainage. See Figure 2K.

Photograph 93. Feature 0713-015. Downgradient view of drainage. See Figure 2K/L.

Photograph 94. Feature 0713-016. Upgradient view of drainage. See Figure 2K.

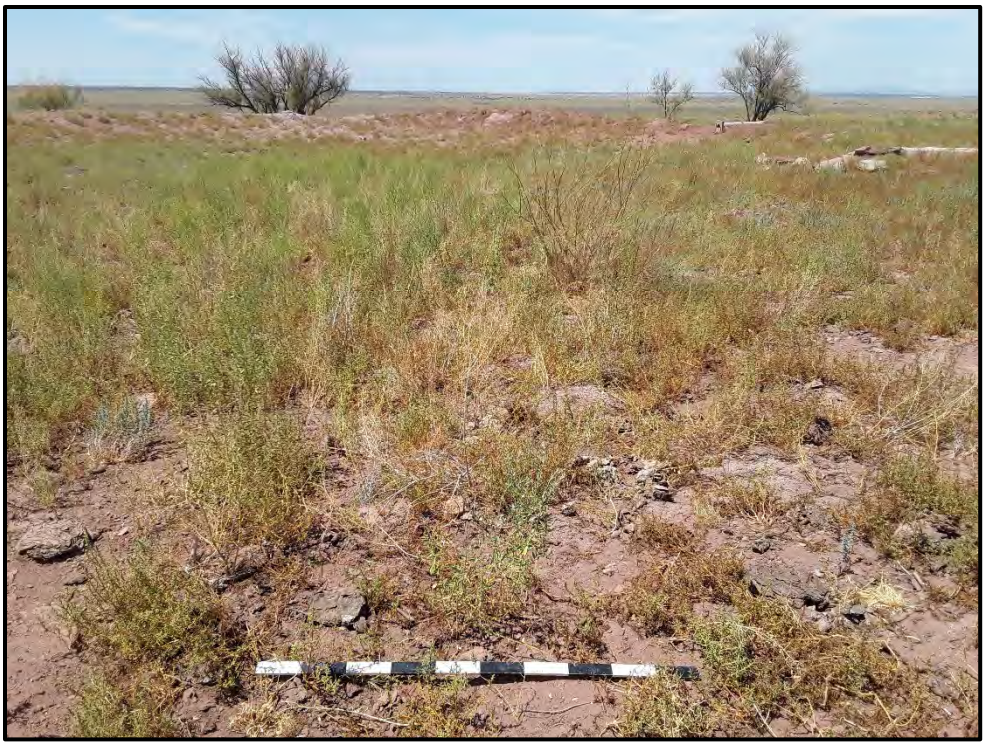
Photograph 95. Feature 0713-017. Downgradient view of drainage. See Figure 2L.



Photograph 96. Feature 0713-018. Upgradient view of drainage. See Figure 2L.

Photograph 97. Feature 0713-019. Downgradient view of drainage. See Figure 2K.

Photograph 98. Feature 0713-020. Upgradient view of drainage. See Figure 2K/L.



Photograph 99. Feature 0713-021. Downgradient view of drainage. See Figure 2G.

EXHIBIT C – SPECIAL STATUS SPECIES AND SPECIES OF CONCERN

Arizona Revised Statutes (ARS) §40-360 et seq. established the Power Plant and Transmission Line Siting Committee in 1971. ARS §40-360.06(A)(2) stipulates "fish, wildlife, and plant life and associated forms of life on which they are dependent" are among the factors the Siting Committee must consider in reviewing CEC applications. As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

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

INTRODUCTION

Exhibit C addresses species protected by federal or state laws and policies because of their conservation status. Exhibit C also addresses whether any areas protected for conservation purposes are present in or near the vicinity of the Project. Some databases used to review existing data in the region do not return results based strictly on a 2-mile radius. Exhibit C addresses the complete results of those database queries and discusses whether identified species or protected areas may be present or affected by the Project.

Laws and Policies

Federal and state laws and policies protecting rare species on private lands in Arizona would apply to the Project.

The U.S. Fish and Wildlife Service (USFWS) administers the Endangered Species Act of 1973 (ESA), as amended. The ESA protects species listed as threatened or endangered from "take" (generally, directly or indirectly harming or disturbing listed species). Prior to being listed as threatened or endangered, a proposed listing rule is issued. When agency priorities take precedence over certain listing actions, species may also be designated as candidates, to be evaluated and potentially listed when no longer precluded by higher-priority actions. The ESA also allows for the designation of critical habitat for listed species, although designation of critical habitat is not required. Critical habitat is an administrative designation of a defined area with specific characteristics important to the survival and recovery of a listed species. Designation of critical habitat can affect federal actions, but not state or private actions without a federal nexus. ESA-listed species known or likely to occur in the Project vicinity are addressed in Table C-1 and in the following sections.

The Arizona Game and Fish Department (AGFD) manages and conserves wildlife in Arizona. Nearly all take of wildlife is regulated in some manner through the hunting and fishing license system. Arizona does not have a counterpart to the federal ESA but a list of rare species (Wildlife Species of Concern [WSC]) was created in 1996 without creating any specific statutory protections for those species (AGFD 19961). However, hunting regulations are used to provide some protection. Generally, no hunting or capture of those species is allowed, with some exceptions for managed recreational fisheries of native fish (AGFD 20172), and recreational capture of certain reptiles (AGFD 20153).

Arizona prepared a Comprehensive Wildlife Conservation Strategy in 2006 (AGFD 20064), later renamed State Wildlife Action Plan (SWAP), through a state-federal partnership and grant program. The SWAP was updated in 2012 (AGFD 20125). The SWAP identifies Species of Greatest Conservation Need (SGCN), in several tiers. Tier IA includes ESA-listed species and other rare species. Tier IB includes species that are not listed but are regionally rare or declining, species with a U.S. range primarily in Arizona that are dependent on conservation efforts within the state, and other species with identified conservation issues that may warrant management action. Tier IC includes species with substantial data gaps and unknown conservation status, but where conservation concern may be warranted. Other tiers include species that are common, widespread, or are in stable populations. Table C-1 and the following sections address Tier IA and IB SGCNs.

Native plants in Arizona are managed by the Arizona Department of Agriculture (ADA), which regulates harvest, salvage, and transport of plants. Harvest or salvage of most plant species may be permitted or required, and fees may be assessed on state land. Plants listed in a Highly Safeguarded category may only be taken or salvaged for scientific or conservation purposes. No Highly Safeguarded plant species, or any other rare plant species, are present in the Project area. Although private landowners may manage vegetation on their property, the ADA requires tagging of protected native plants that are transported off of private lands. Additionally, the ADA requires that notice be provided prior to clearing native vegetation on private lands.

No other federal or state agency has jurisdiction over sensitive biological resources in the Project vicinity.

INVENTORY

Methods

To identify the plant and wildlife species that may occur within the Project area, SWCA Environmental Consultants (SWCA) reviewed multiple environmental and biological data sources to collect existing environmental and biological data. Through that process, the following documents and online sources were reviewed:

[1] Arizona Game and Fish Department (AGFD) 1996. Wildlife of Special Concern in Arizona. Public review draft. Nongame and Endangered Wildlife Program, Arizona Game and Fish Department, Phoenix, Arizona. 23 p.

[2] Arizona Game and Fish Department (AGFD). 2017. Arizona Game and Fish Department 2017 & 2018 Fishing Regulations. Arizona Game and Fish Department, Phoenix, Arizona. 68 pp.

[3] Arizona Game and Fish Department (AGFD). 2015. Arizona Reptile and Amphibian Regulations 2015 & 2016. Arizona Game and Fish Department, Phoenix, Arizona. 9 pp.

[4] Arizona Game and Fish Department (AGFD). 2006. Arizona's Comprehensive Wildlife Conservation Strategy 2005-20l 5. Arizona Game and Fish Department, Phoenix, Arizona. 834 pp.

[5] Arizona Game and Fish Department (AGFD). 2012. Arizona's State Wildlife Action Plan: 2012-2022. Arizona Game and Fish Department, Phoenix, Arizona. 245 pp.

- AGFD's HabiMap Online Project Evaluation Tool[6] and Arizona Heritage Geographic Information System Online Environmental Review Tool[7] (Appendix B-2)
- USFWS Information for Planning and Consultation (IPaC) online mapping tool[8] (Appendix B-1)
- Biotic Communities: Southwestern United States and Northwestern Mexico[9]
- USFWS Birds of Conservation Concern[10]
- Audubon Society Christmas Bird Counts[11]
- Audubon Society Important Bird Areas[12]
- U.S. Geological Survey (USGS) North American Breeding Bird Survey Database[13]
- Arizona Department of Transportation, Arizona Wildlife Linkages Assessment Tool[14]
- USGS Southwest Regional Gap Analysis Project (SWReGAP) land cover database[15]

In addition, a SWCA ecologist conducted a field reconnaissance survey on April 8 and 9, 2019, within the Project area. Reconnaissance included ground-based (pedestrian and windshield) surveys to identify and document the vegetative communities, potential foraging resources, topography, and other habitat features to evaluate potential wildlife usage within the Project area. This reconnaissance survey also addressed and verified the habitat types within the Project area to assess whether there is suitable habitat for federally listed and other special-status species.

The USFWS maintains an online database, the Information for Planning and Conservation (IPaC) database, that generates lists of ESA-listed species and their critical habitat that may be present in an area subject to query. An IPaC addressing the Project corridor is included as Appendix C-1, and the results of the query are addressed in this Exhibit (C). On April 10, 2019, the AGFD provided a comment letter and database report (Appendix C-2) with SGCNs that may be present in the Project vicinity. Additionally, on May 26, 2020, AGFD provided a letter (Appendix C-3) indicating that agency does not believe there are any wildlife concerns, including wildlife corridors, for this Project at this time.

[6] Arizona Game and Fish Department (AGFD). 2019a. HabiMap Online Project Evaluation Tool. Available at: http://www.habimap.org. Accessed April 18, 2019.

[7] AGFD. 2019b. Arizona Heritage Geographic Information System Online Environmental Review Tool. Available at: http://www.habimap.org. Accessed April 18, 2019.

[8] U.S. Fish and Wildlife Service (USFWS). 2019. Information for Planning and Consultation (IPaC) website. Environmental Conservation Online System. Available at: http://ecos.fws.gov/ipac/. Accessed April 5, 2019.

[9] Brown, D.E. (ed.). 1994. *Biotic Communities: Southwestern United States and Northwestern Mexico*. Salt Lake City: University of Utah Press.

[10] USFWS. 2008. *Birds of Conservation Concern 2008*. Arlington, Virginia: U.S. Fish and Wildlife Service.

[11] Audubon Society (Audubon). 2019. Christmas Bird Count Map. Available at: https://www.arcgis.com/home/webmap/viewer.html?webmap=c767b983e9e84150b6dc608aac7ab93f. Accessed April 18, 2019.

[12] Audubon. 2019. Audubon Important Bird Areas Map. Available at: http://www.audubon.org/important-bird-areas. Accessed April 18, 2019.

[13] U.S. Geological Survey (USGS) 2016a. North American Breeding Bird Survey – Route Maps. USGS Patuxent Wildlife Research Center. Available at: https://www.pwrc.usgs.gov/bbs/RouteMap/Map.cfm. Accessed April 23, 2019.

[14] Arizona Department of Transportation. 2006. Arizona Wildlife Linkages Assessment tool. Available at: https://www.azdot.gov/business/environmental-planning/programs/wildlife-linkages. Accessed April 18, 2019.

[15] USGS. 2016b. Southwest Regional Gap Analysis Project. Available at: http://swregap.org/. Accessed April 8, 2019.

Protected Areas

No protected areas are present in the Project area. No proposed or designated critical habitat occurs within the Project area or within a 10-mile buffer.

Special-Status Species

Table C-1 addresses species listed in the reports from the AGFD and IPaC databases. Table C-1 provides summary information, including notes on whether each species may be present in the Project vicinity. Most special-status species in Table C-1 are dependent on native vegetation and are not present in the Project vicinity due to heavy livestock grazing practices within the Project area. Some species, however, including some bats and migratory birds, can live or forage in modified habitat such as that within the Project corridor, and Table C-1 addresses the potential for those species to be present. If a species may be present, Exhibit C includes a discussion of the species and how it may be affected by the Project. The discussions of species and potential impacts of the Project following Table C-1 addresses species with similar habitat uses or types of impacts collectively wherever possible.

Table C-1: Wildlife Special-Status Species That Are Known or Likely to Occur in the Project Vicinity

Wildlife Type / Common Name	Scientific Name	Status[1]	Habitat	Seasons of Potential Occurrence and Likelihood of Occurrence in the Project Area[2]			
				Spring	Summer	Fall	Winter
Amphibians							
Anurans							
Arizona toad	*Anaxyrus microscaphus*	SGCN 1B	Found in areas of shallow, flowing, permanent water over sandy or rocky substrates.	N	N	N	N
Chiricahua leopard frog	*Rana chiricahuensis*	T	Found in permanent or semi-permanent springs, livestock tanks, and streams in the upper portions of watersheds.	N	N	N	N
Birds							
Raptors							
Bald eagle	*Haliaeetus leucocephalus*	BGEPA, SGCN 1A	Prefers mature trees and snags near water for breeding in winter/spring; forages in a variety of habitats, including dry areas in summer/fall/winter.	L	N	L	L
Ferruginous hawk	*Buteo regalis*	SGCN 1B	Prefers to forage in open environments including grasslands or desert.	L	L	L	L
Golden eagle	*Aquila chrysaetos*	BGEPA, SGCN 1B	Prefers mountainous areas for breeding; found foraging in grasslands, shrub steppe, deserts, and other open areas.	M	M	M	M
Swainson's hawk	*Buteo swainsoni*	SGCN 1C	Breeds in grassland in northern Arizona in summer.	L	L	L	N
Cuckoos							
Yellow-billed cuckoo	*Coccyzus americanus*	T	During spring through early fall, breeds typically in riparian woodland vegetation.	N	L	L	N
Flycatchers							
Gray flycatcher	*Empidonax wrightii*	SGCN 1C	Found in sagebrush, pinyon-juniper, or open ponderosa pine forests.	N	N	N	N
Jays							
Pinyon jay	*Gymnorhinus cyanocephalus*	SGCN 1B	Inhabits pinyon-juniper woodland; also found in sagebrush, scrub oak (*Quercus* spp.), and chaparral.	N	N	N	N
Meadowlarks							

Wildlife Type / Common Name	Scientific Name	Status[1]	Habitat	Seasons of Potential Occurrence and Likelihood of Occurrence in the Project Area[2]			
				Spring	Summer	Fall	Winter
Eastern meadowlark	*Sturnella magna*	SGCN 1C	Found in native grasslands and prairies, but also occurs in pastures, hayfields, agricultural fields, airports, and other grassy areas.	M	M	M	M
Nighthawks							
Common nighthawk	*Chordeiles minor*	SGCN 1B	Found in a variety of open habitats including sagebrush and desert grassland, prairies and plains, open forests, croplands, rock outcrops, and gravel rooftops.	N	H	N	N
Owls							
Burrowing owl, western burrowing owl	*Athene cunicularia hypugaea*	SGCN 1B	Occurs in open areas, areas with mammal burrows, and areas that have been cleared for human use.	H	H	H	L
Quail							
Scaled quail	*Callipepla squamata*	SGCN 1C	Live year-round in desert grasslands and shrublands including open plains, hills, mesas, sagebrush, and pinyon-juniper woodlands.	N	N	N	N
Shorebirds							
Virginia rail	*Rallus limicola*	SGCN 1C	Breeds in shallow freshwater wetlands with tall stands of cattails and rushes.	L	L	L	L
Sparrows							
Brewer's sparrow	*Spizella breweri*	SGCN 1C	Breeds in open sagebrush habitats. Winters in sagebrush or desertscrub habitats containing saltbush and creosote.	H	L	H	N
Thrashers							
Sage thrasher	*Oreoscoptes montanus*	SGCN 1C	Winters in Arizona in grasslands with scattered shrubs and open pinyon-juniper woodlands. Breeds exclusively in shrub steppe habitats dominated by sagebrush species.	L	M	L	N
Titmice							
Juniper titmouse	*Baeolophus ridgwayi*	SGCN 1C	Found year-round in Arizona in pinyon-juniper woodlands; may be mixed with deciduous or evergreen oaks.	N	N	N	N
Vireos							
Gray vireo	*Vireo vicinior*	SGCN 1C	Found in mixed pinyon-juniper and oak scrub associations and/or chaparral.	N	N	N	N
Vultures							

Wildlife Type / Common Name	Scientific Name	Status[1]	Habitat	Seasons of Potential Occurrence and Likelihood of Occurrence in the Project Area[2]			
				Spring	Summer	Fall	Winter
California condor	*Gymnogyps californianus*	E, EXPN	Nests in a variety of rock formations, including caves crevices, and potholes in isolated scrubby chaparral and forested montane regions.	L	L	L	L
Warblers							
Yellow warbler	*Setophaga petechia*	SGCN 1B	Occupies wet, deciduous thickets, especially those dominated by willows, and disturbed and early successional habitats.	M	L	L	N
Wrens							
Pacific wren	*Troglodytes pacificus*	SGCN 1B	Occupies a wide range of habitats including deciduous and coniferous riparian forests, hardwood forests, and mixed-conifer hardwood forests.	N	N	N	N
Mammals							
Bats							
Arizona myotis	*Myotis occultus*	SGCN 1B	Day roosts and maternity colonies in tree cavities and crevices; maternity colonies also in buildings and bridges; winter roost records from mines.	M	M	M	M
Brazilian free-tailed bat	*Tadarida brasiliensis*	SGCN 1B	Found in a wide variety of habitats from desert communities through pinyon-juniper woodlands and pine-oak forests.	M	M	M	N
Pale Townsend's big-eared bat	*Corynorhinus townsendii pallescens*	SGCN 1B	Day roosts and maternity and hibernation colonies in caves, mines, or buildings. Night roosts may include caves, buildings, and tree cavities.	L	L	L	L
Spotted bat	*Euderma maculatum*	SGCN 1B	Roosts in crevices and cracks of cliff faces; sometimes roosts in caves or in buildings near cliffs. Variety of habitats including low to high deserts, riparian areas, ponderosa, and spruce-fir.	L	L	L	L
Western red bat	*Lasiurus blossevillii*	SGCN 1B	Roosts in trees, particularly cottonwoods. Associated with broad-leaf deciduous riparian forests and woodlands.	N	N	N	N
Yuma myotis	*Myotis yumanensis*	SGCN 1B	In spring through fall, found in desert scrub, riparian, woodlands, and forests; however, this species is closely associated with water and cliff faces. Roosts in caves, mines, cliff crevices, buildings, and bridges.	L	L	L	N
Non-bat Mammals							
American beaver	*Castor canadensis*	SGCN 1B	Inhabits permanent water sources. Prefers low-gradient streams, ponds, and small-bottomed lakes with dammable outlets.	N	N	N	N

Wildlife Type / Common Name	Scientific Name	Status[1]	Habitat	Seasons of Potential Occurrence and Likelihood of Occurrence in the Project Area[2]			
				Spring	Summer	Fall	Winter
American pronghorn	*Antilocapra americana americana*	SGCN 1B	Found in grasslands, sagebrush plains, deserts, and foothills.	M	M	M	M
Black-footed ferret	*Mustela nigripes*	E, EXPN, SGCN 1A	Found in grassland plains on mountain basins in association with prairie dogs (*Cynomys* spp.).	N	N	N	N
Gray wolf	*Canis lupus*	E, PD	Occupies a wide range of habitats including temperate forests, mountains, tundra, taiga, and grasslands.	N	N	N	N
Gunnison's prairie dog	*Cynomys gunnisoni*	SGCN 1B	Colonizes gently sloping grasslands and semi-desert and montane shrublands at elevations.	L	L	L	L
Kit fox	*Vulpes macrotis*	SGCN 1B	Occurs in open desert, shrubby, or shrub-grass habitat.	H	H	H	H
Springerville pocket mouse	*Perognathus flavus goodpasteri*	SGCN 1B	Found year-round in plains-like short grasslands interspersed with volcanic rock or other sparsely vegetated grasslands.	N	N	N	N
Stephen's woodrat	*Neotoma stephensi*	SGCN 1B	Inhabits rocky areas in pinyon-juniper woodlands year-round.	N	N	N	N

Sources: AGFD (2019b); Brennan and Holycross (2006); Corman and Wise-Gervais (2005); Cornell Lab of Ornithology (2019); eBird (2019); NatureServe (2019); Reid (2006); Udvardy (1997); USFWS (2019c).

[1] Status:

Federal (USFWS) designations: BGEPA = Bald and Golden Eagle Protection Act (federal); E = Endangered; T = Threatened;
EXPN = Experimental, Nonessential population; PD = Proposed for Delisting.

State (AGFD) designations: SGCN = Species of Greatest Conservation Need, as defined in the Arizona State Wildlife Action Plan (AGFD 2012)

Arizona Department of Agriculture designations: SR = Salvage Restricted

1A: Scored "1" for Vulnerability in at least one of 8 categories (Federal or State legal status, Extirpated from Arizona, Declining status, Disjunct status, Demographic status, Concentration status, Fragmentation status, Distribution status), or matches at least one of the following:

- Federally listed as Endangered or Threatened under the Endangered Species Act

- Federally listed as Candidate species

- Is specifically covered under a signed conservation agreement (CCA)

- Federally protected under the BGEPA

- Requires post-delisting monitoring

- Is petitioned for listing

1B: Scored "1" for Vulnerability in at least one of the 8 categories as defined under 1a but matches none of the other criteria above

1C: Unknown status species.

[2] Potential Occurrence: Used to indicate potential of species to occur within the Project area during each season: H=High potential to occur; M=Moderate potential to occur; L=Low potential to occur; N=No potential to occur.

FEDERALLY THREATENED OR ENDANGERED SPECIES

Birds

The potential for occurrence within the Project area is low for both California condor (*Gymnogyps californianus*) and yellow-billed cuckoo (*Coccyzus americanus*). The Project area is just south of Interstate 40, which is the southern boundary of the designated non-essential experimental population 10(j) area for California condor; therefore, condors may occasionally pass through the Project vicinity. The Project area does not contain suitable nesting or roosting habitat for condors, and there are no sources of carrion present. Yellow-billed cuckoos may travel through a small section of the Project area via the Little Colorado River corridor. This area, however, does not contain suitable breeding habitat for this species.

Mammals

The potential for occurrence within the Project area is unlikely for one federally listed mammal species in Navajo County, gray wolf (*C. lupus*). The Project area is outside of the known geographic range for gray wolf. Gray wolf is an experimental, non-essential population that has been proposed for delisting.

Fish

The potential for occurrence within the Project area is likely for one federally listed fish species, Little Colorado River spinedace (*Lepidomeda vittata*), due to the proximity to the Little Colorado River.

Reptiles and Amphibians

The one federally listed reptile, northern Mexican gartersnake (*Thamnophis eques megalops*), and one amphibian, Chiricahua leopard frog (*Rana chiricahuensis*), are not likely to occur as the Project area is outside the known range for both species.

Plants

Peebles Navajo cactus (*Pediocactus peeblesianus*), a federally endangered plant species, is likely to occur in the Project area, although none were observed during field reconnaissance. The species prefers weakly alkaline, gravelly soils where the host gravel can occur on a variety of substrates, including but not limited to the Shinarump conglomerate of the Chinle Formation. This soil type is present within the Project area.

No proposed or designated critical habitat occurs within the Project vicinity for any of the above discussed species.

EAGLES

Although there are no documented occurrences of eagles in the Project area, there are occurrence records for both bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) in Navajo County, and both species are predicted to occur in the Project area vicinity by AGFD range models. No eagle nesting areas within the Project area or 5-mile buffer were identified by AGFD.

Bald eagles can occur anywhere in Arizona in winter; however, large, fish-bearing waters are essential for bald eagle breeding and nesting. Most bald eagle nests in Arizona are found in the central portion of the state at elevations below 3,500 feet above mean sea level (amsl) and are within 1 mile of water sources providing sufficient fish and waterfowl for hunting.[16] The Project area does not contain suitable breeding or nesting habitat for this species.

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[16] McCarty, K.M., K.L. Licence, and K.V. Jacobson. 2018. *Arizona Bald Eagle Management Program 2018 Summary Report*. Nongame and Endangered Wildlife Program Technical Report 321. Phoenix: Arizona Game and Fish Department.

Wintering habitat for bald eagles generally contains adequate food supply and open water. Bald eagles tend to use tall trees, ridgetops, cliffs, and cliff faces for perches. The Project area does not contain cliffs or tall trees, and the Little Colorado River is an intermittent water source providing very little open water. Bald eagles may pass through the Project area occasionally in winter or during migration but are not likely to forage or breed in the Project area.

Golden eagles prefer mountainous areas for breeding, and typically nest on rock ledges, cliffs, or in large trees at elevations ranging from 4,000 to 10,000 feet amsl. During the field reconnaissance, no suitable rock outcrops, cliffs, or large trees were observed in the Project area. Golden eagles can build nests in transmission line towers, but no nests were observed in any of the existing towers. Golden eagles hunt over a wide variety of vegetation types, including the desert scrub and grassland found within the Project area and buffer. Although there are very few occurrence records for this species in the Project vicinity, the Project area may provide foraging habitat for this species.

STATE SPECIAL STATUS SPECIES

Thirty-four SGCN-ranked species were identified in the output obtained from using AGFD's Online Environmental Review Tool that are known to occur within 5 miles[17] of the Project area or are predicted to occur in the project area based on range models. Based on range, vegetation, and other habitat features, 21 of the 34 species (11 birds, five bats, three non-bat mammals, one fish, and one reptile) may occur in the project area. None of the 21 species that may occur in the Project area were observed during the field survey, and only western burrowing owl (*Athene cunicularia hypugaea*) is likely to occur in the Project area, as the species has been observed by the ranch's manager (personal communication, Corina Anderson, Environmental Specialist, SWCA, and J.R. DeSpain, ranch manager, Obed Ranch). The 21 species that may occur in the Project area are discussed below.

Birds

The following bird species have the potential to occur in the Project area year-round because the Project is within their range and contains suitable habitat features or vegetation for foraging, nesting, or dispersal: western burrowing owl, golden eagle, ferruginous hawk (*Buteo regalis*), Virginia rail (*Rallus limicola*), and eastern meadowlark (*Sturnella magna*).

Some bird species may be present during migration or summer months only. These include Swainson's hawk (*Buteo swainsoni*), common nighthawk (*Chordeiles minor*), yellow warbler (*Setophaga petechia*), and sage thrasher (*Oreoscoptes montanus*). One species, bald eagle, may be present in winter or during migration.

Bats

The Project area contains no suitable bat roosting habitat (e.g., caves, mines, bridges, or buildings); however, three bat species may forage within the Project area year-round. These are pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), Arizona myotis (*Myotis occultus*), and spotted bat (*Euderma maculatum*). The following species are known to migrate and may forage within the Project area during spring, summer, and fall: Brazilian free-tailed bat (*Tadarida brasiliensis*) and Yuma myotis (*Myotis yumanensis*).

[17] AGFD's Environmental Online Review Tool (AGFD 2019a) uses a 5-mile buffer around the project area in determining the list of special-status species potentially occurring within and near proposed solar energy projects.

Mammals
The following non-bat mammal species may use the Project area year-round to forage, breed, or disperse: American pronghorn (*Antilocapra americana americana*), Gunnison's prairie dog (*Cynomys gunnisoni*), and kit fox (*Vulpes macrotis*).

Fish
One fish species may occur in the Project area where it transects the Little Colorado River when there is sufficient water: Little Colorado spinedace (*Lepidomeda vittata*).

Reptiles and Amphibians
One reptile species, Pai striped whiptail (*Aspidoscelis pai*), may use the Project area year-round to forage, breed, or disperse.

Plants
Three ADA plant species designated as Salvage Restricted have also been documented within 5 miles of the Project area (AGFD 2019b). These include gladiator milkvetch (*Astragulus xiphoides*), roundleaf errazuizia (*Errazurizia rotundata*), and Whipple's fishhook cactus (*Sclerocactus whipplei*). These three species were not observed during the field survey but may occur due to the proximity of historic documented observations and the presence of suitable habitat within the Project area.

SUMMARY OF POTENTIAL IMPACTS

Birds
Substrate exists for passerine species' nests, though none were observed at the time of the reconnaissance survey. Standard best management practices (BMPs) will be employed during construction to prevent disturbance to bird nests. Because of the abundance of similar habitat in the surrounding area, the impacts on the bird populations that would utilize those habitat types within the proposed Project area is low.

The effects of exposure to electromagnetic fields (EMF) by birds nesting near power lines is largely unknown. Transmission lines pose a risk of collisions and electrocution for birds, particularly eagles and other raptors. To minimize that risk, BMPs will be applied, including transmission structures meet Avian Powerline Interaction Committee (APLlC) standards (APLIC 2012[18]). When these standards are met, the risk of electrocution for large birds, including all special-status species in the Project area, is essentially eliminated.

Most special-status birds are not likely to nest in the Project area; however, burrowing owls can use nests in disturbed areas used for livestock grazing. Burrowing owls in some cases retreat underground when alarmed rather than fly, and because their burrows are underground, they are at risk of harm from ground-disturbing activities such as those resulting from construction of the Project. No burrowing owls were observed during the reconnaissance survey but could occupy the Project area prior to construction. No special-status birds are regularly dependent on the disturbed habitat present in the Project area. Although some ground disturbances and vegetation removal would occur as a result of the Project, this is not likely to have a detectable effect on any special-status bird species.

Bats
Impacts of the Project on bats are expected to be negligible because bats are well adapted to avoid stationary objects by using echolocation.

[18] Avian Powerline Interaction Committee (APL1C). 2012. Reducing Avian Collisions with Powerlines: the State Art in 2012. Edison Electric Institute, and APLIC, Washington, DC. 184 pp.

During normal foraging activity, bats are actively using echolocation and are typically able to detect and avoid features such as overhead transmission lines. Ground disturbance from the Project, taking place in previously disturbed areas with little vegetation, would not appreciably affect any bat species by removing foraging habitat.

Mammals

Non-bat mammals may be affected by the Project (e.g., ground-dwelling animals in areas of ground disturbance could be injured or killed during construction), but none are likely to be substantially affected. Construction-related activity and noise may disturb species in the area and cause them to avoid or move away from the Project area or temporarily alter their behavior in other ways (e.g., remain underground). Once construction is completed, it is expected that wildlife will return to the area and resume normal behavior patterns. Transmission lines do not appear to affect most wildlife movements, including those of antelope, deer, and elk.[19, 20, 21]

Fish

The only federally listed fish species within the Project area vicinity is the Little Colorado River spinedace, due to the proximity to the Little Colorado River. Neither the aquatic habitat in the Little Colorado River nor any species associated with that habitat will be affected by the Project. The transmission line will span Little Colorado River above the riverbed. No ground disturbance will take place in or near the river. Standard BMPs will be employed during construction to prevent contamination of stormwater runoff from the Project.

Reptiles and Amphibians

Amphibian species are not expected to be affected by the Project because 1) no ground disturbance is planned to take place in or near aquatic habitats where amphibians may occur, and 2) no ground disturbance will take place in or near the Little Colorado River where amphibians likely occur.

Reptiles may be affected by the Project (e.g., ground-dwelling animals in areas of ground disturbance could be injured or killed during construction), but none are likely to be substantially affected. Construction-related activity and noise may disturb species in the area and cause them to avoid or move away from the Project area or temporarily alter their behavior in other ways (e.g., remain underground).

Plants

Construction of the Project will result in the long-term removal of a small amount of vegetation. Native vegetation characteristic of Great Basin Desertscrub and Plains and Great Basin Grassland is extensive in northern Arizona, and the acreage of disturbance as a percentage of the remaining habitat is small. The removal of vegetation will not result in significant impacts to the vegetation communities as a whole.

Removal of vegetation associated with clearing portions of the transmission line right-of-way (ROW) and placement of support structures would result in a small loss of habitat that could provide nesting sites, cover, and/or forage for bird and mammal species or their prey.

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[19] Goodwin, J. 1975. Big game movement near a 500-kV transmission line in northern Idaho. Bonneville Power Administration unpublished report. Portland, Oregon.

[20] Lee, J.M., and BPA Biological Studies Task Team. 1989. *Electrical and Biological Effects of Transmission Lines: A Review*. Portland, Oregon: Bonneville Power Administration. Available at: https://www.osti.gov/servlets/purl/5712107. Accessed June 2019.

[21] Thompson, L.S. 1977. *Overhead Transmission Lines: Impact on Wildlife*. Research Report No. 2. Helena: Montana Department of Natural Resources and Conservation.

In temporarily disturbed areas along the transmission line ROW, species composition of birds and mammals using those areas may change over time as vegetation species and structure recover. The acreage of vegetation to be cleared is small, particularly relative to the large amount of comparable habitat available in and around the Gen-Tie Project area footprint. Removal of vegetation is expected to have negligible effect on wildlife species. There would be no habitat fragmentation or edge effects from clearing portions of the transmission ROW or placement of support structures.

MITIGATION

Because the Project area is largely located in areas subject to previous disturbance and outside of areas that provide essential habitat for rare or endangered species, impacts to most special-status species present in the region would not occur or would not rise to a level that would warrant mitigation. The following measures address the risk that electrical infrastructure poses to special-status birds, and the risk that ground-disturbing activities pose to burrowing owls:

- Transmission structures meet Avian Powerline Interaction Committee (APLIC) standards (APLIC 2012[22]). When these standards are met, the risk of electrocution for large birds, including all special-status species in the Project area, is essentially eliminated.
- Preconstruction surveys for burrowing owls would be conducted by qualified biologists according to current protocol[23]. Burrows occupied by burrowing owls would be avoided if feasible. If any burrowing owl relocation is necessary, this would be performed by a licensed wildlife rehabilitator.

CONCLUSION

The proposed Project is not likely to significantly affect any rare species. No ESA-listed species are present, and none would be affected by the proposed Project. No protected areas or any areas of biological wealth are within the Project corridor. The risk that electrical infrastructure poses to birds would be addressed by following standard APLIC guidelines as design features for the Project, and preconstruction surveys for the burrowing owl would address potential impacts to that species.

[22] Avian Powerline Interaction Committee (APL1C). 2012. Reducing Avian Collisions with Powerlines: the State Art in 2012. Edison Electric Institute, and APLIC, Washington, DC. 184 pp.

[23] Arizona Game and Fish Department (AGFD). 2009. Burrowing Owl Project Clearance Guidance for Landowners. Arizona Burrowing Owl Working Group. 9 pp.

APPENDIX C-1 – INFORMATION FOR PLANNING AND CONSERVATION (IPAC)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arizona Ecological Services Field Office
9828 North 31st Ave
#c3
Phoenix, AZ 85051-2517
Phone: (602) 242-0210 Fax: (602) 242-2513
http://www.fws.gov/southwest/es/arizona/
http://www.fws.gov/southwest/es/EndangeredSpecies_Main.html

In Reply Refer To: July 07, 2020
Consultation Code: 02EAAZ00-2020-SLI-1077
Event Code: 02EAAZ00-2020-E-02388
Project Name: Hashknife Solar Facility (2020)

Subject: List of threatened and endangered species that may occur in your proposed project location, and/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 one or more delineated United States Geological Survey 7.5 minute quadrangles with which your project polygon intersects. Each quadrangle covers, at minimum, 49 square miles. In some cases, a species does not currently occur within a quadrangle but occurs nearby and could be affected by a project. Please refer to the species information links found at:
http://www.fws.gov/southwest/es/arizona/Docs_Species.htm
http://www.fws.gov/southwest/es/arizona/Documents/MiscDocs/AZSpeciesReference.pdf .

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 consult with us if their 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, we recommend preparing a biological evaluation similar to a Biological Assessment 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. You should request consultation with us 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 effects. If the Federal action agency determines that the action may jeopardize a proposed species or 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 considering them 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 1026 species of birds are protected by the MBTA, including species such as the western burrowing owl (Athene cunicularia hypugea). Protected western burrowing owls are often 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, you should evaluate your project to determine whether it is likely to disturb or harm eagles. The National Bald Eagle Management Guidelines provide recommendations to minimize potential project impacts to bald eagles:
https://www.fws.gov/migratorybirds/pdf/management/
nationalbaldeaglenanagementguidelines.pdf
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: https://www.fws.gov/birds/policies-and-regulations/incidental-take.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/birds/bird-enthusiasts/threats-to-birds/collisions/communication-towers.php.

Activities that involve streams (including intermittent streams) and/or wetlands are regulated by the U.S. Army Corps of Engineers (Corps). 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.
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.

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/HeritageFund/.

For additional communications regarding this project, please refer to the consultation Tracking Number in the header of this letter. We appreciate your concern for threatened and endangered species. If we may be of further assistance, please contact our following offices for projects in these areas:

Northern Arizona: Flagstaff Office 928/556-2001
Central Arizona: Phoenix office 602/242-0210
Southern Arizona: Tucson Office 520/670-6144

Sincerely,
/s/ Jeff Humphrey Field Supervisor

Attachment

Attachment(s):

- Official Species List

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

Consultation Code: 02EAAZ00-2020-SLI-1077

Event Code: 02EAAZ00-2020-E-02388

Project Name: Hashknife Solar Facility (2020)

Project Type: POWER GENERATION

Project Description: Solar energy facility.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/34.91805811167729N110.36764063178498W

Counties: Navajo, AZ

Endangered Species Act Species

There is a total of 7 threatened, endangered, or candidate species on this species list.

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

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], 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.

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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
Gray Wolf *Canis lupus* Population: Mexican gray wolf, EXPN population No critical habitat has been designated for this species.	Proposed Experimental Population, Non-Essential

Birds

NAME	STATUS
California Condor *Gymnogyps californianus* Population: U.S.A. only, except where listed as an experimental population There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8193	Endangered
California Condor *Gymnogyps californianus* Population: U.S.A. (specific portions of Arizona, Nevada, and Utah) There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/8193	Experimental Population, Non-Essential
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **proposed** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Reptiles

NAME	STATUS
Northern Mexican Gartersnake *Thamnophis eques megalops* There is **proposed** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7655	Threatened

Fishes

NAME	STATUS
Little Colorado Spinedace *Lepidomeda vittata* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6640	Threatened

Flowering Plants

NAME	STATUS
Peebles Navajo Cactus *Pediocactus peeblesianus var. peeblesianus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8245	Endangered

Critical habitats

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

APPENDIX C-2 – ARIZONA GAME AND FISH DEPARTMENT DATABASE REPORT

Arizona Environmental Online Review Tool Report

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

Project Name:
Hashknife Energy Center

User Project Number:
60208

Project Description:
Hashknife Energy Center

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

Contact Person:
Tom Koronkiewicz

Organization:
SWCA

On Behalf Of:
CONSULTING

Project ID:
HGIS-11535

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.

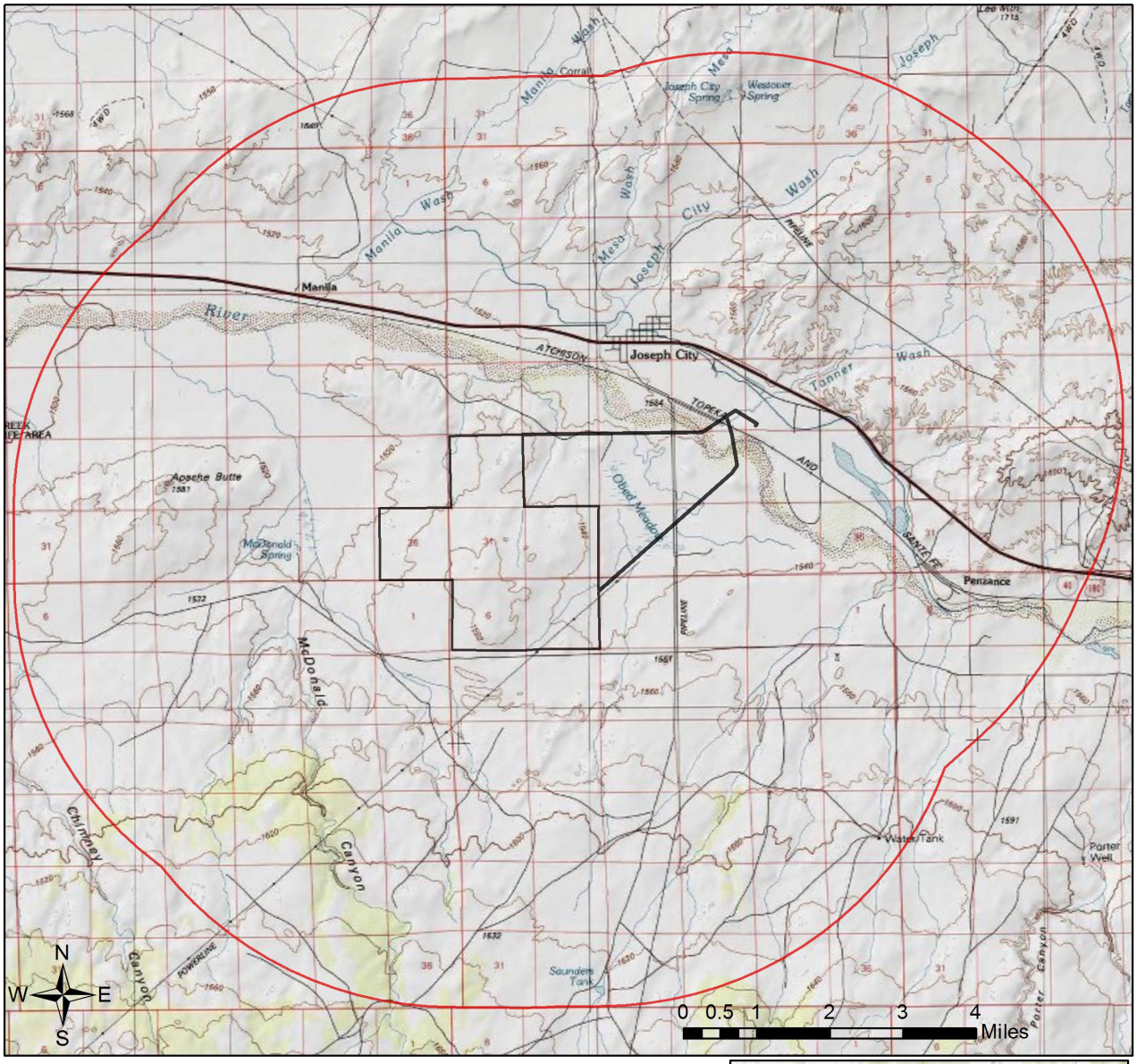
Locations Accuracy Disclaimer:
Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Report is solely responsible for the project location and thus the correctness of the Project Review Report content.

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

Hashknife Energy Center

USA Topo Basemap With Locator Map



Project Boundary

Buffered Project Boundary

Project Size (acres): 3,926.36

Lat/Long (DD): 34.9136 / -110.3640

County(s): Navajo

AGFD Region(s): Pinetop

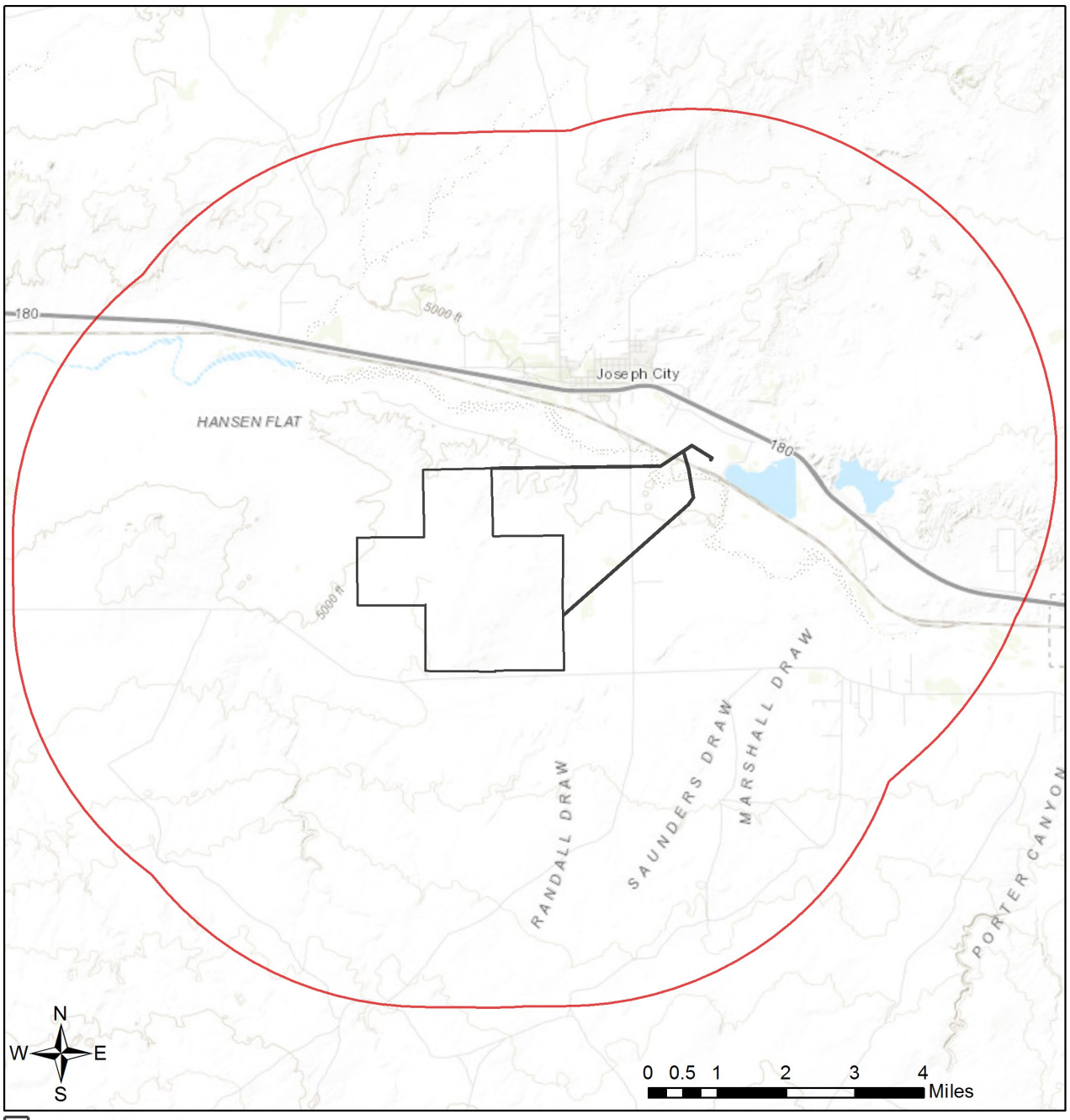
Township/Range(s): T17N, R18E; T17N, R19E; T18N, R18E +

USGS Quad(s): APACHE BUTTE; JOSEPH CITY

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

Hashknife Energy Center

Web Map As Submitted By User



Project Boundary

Buffered Project Boundary

Project Size (acres): 3,926.36

Lat/Long (DD): 34.9136 / -110.3640

County(s): Navajo

AGFD Region(s): Pinetop

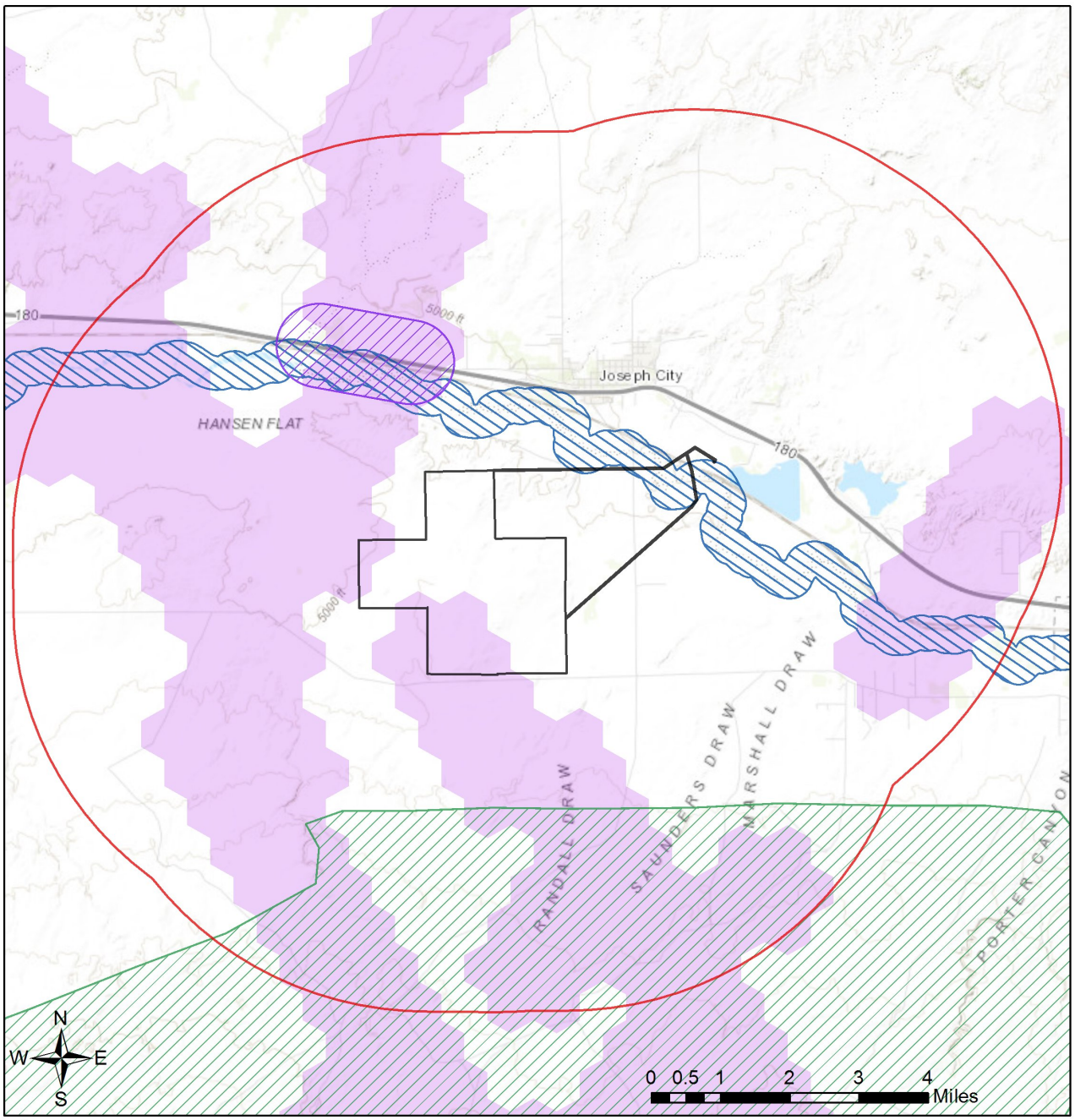
Township/Range(s): T17N, R18E; T17N, R19E; T18N, R18

USGS Quad(s): APACHE BUTTE; JOSEPH CITY

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

Hashknife Energy Center

Important Areas



- Project Boundary
- Buffered Project Boundary

County Stakeholder Assessment

- Wildlife Crossing Area
- Wildlife Movement Area - Diffuse
- Wildlife Movement Area - Landscape
- Wildlife Movement Area - Riparian/Wash
- Wildlife Connectivity
- Important Connectivity Zones
- Pinal County Riparian
- Critical Habitat
- Important Bird Areas

Project Size (acres): 3,926.36

Lat/Long (DD): 34.9136 / -110.3640

County(s): Navajo

AGFD Region(s): Pinetop

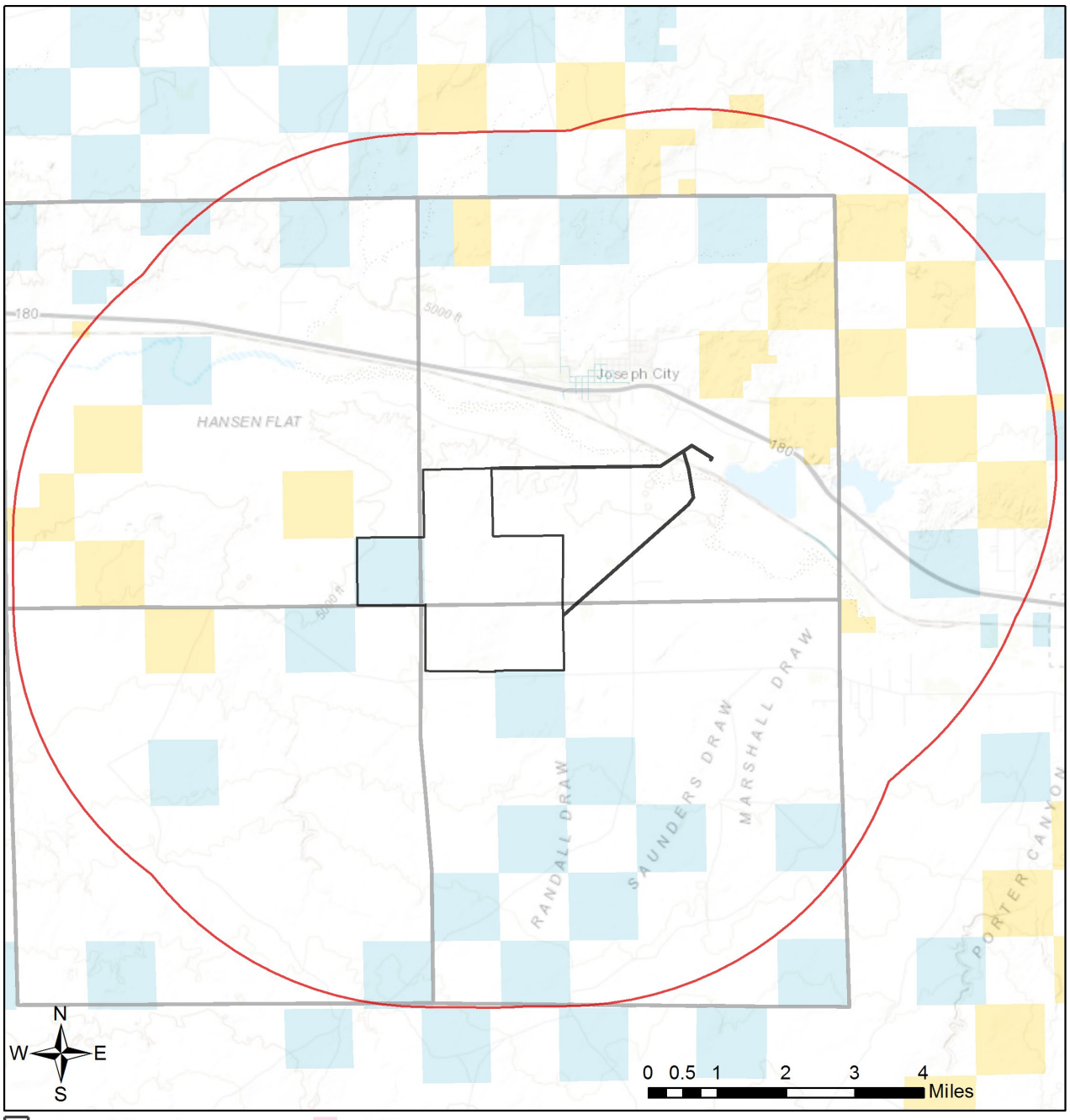
Township/Range(s): T17N, R18E; T17N, R19E; T18N, R18

USGS Quad(s): APACHE BUTTE; JOSEPH CITY

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

Hashknife Energy Center

Township/Ranges and Land Ownership



- Project Boundary
- Buffered Project Boundary
- Township/Ranges

Land Ownership

- AZ Game & Fish Dept.
- BLM
- BOR
- Indian Res.
- Military
- Mixed/Other
- National Park/Mon.
- Private
- State & Regional Parks
- State Trust
- US Forest Service
- Wildlife Area/Refuge

Project Size (acres): 3,926.36

Lat/Long (DD): 34.9136 / -110.3640

County(s): Navajo

AGFD Region(s): Pinetop

Township/Range(s): T17N, R18E; T17N, R19E; T18N, R18

USGS Quad(s): APACHE BUTTE; JOSEPH CITY

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

Special Status Species Documented within 5 Miles of Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Astragalus xiphoides	Gladiator Milkvetch	SC			SR	
Buteo regalis	Ferruginous Hawk	SC		S		1B
Errazurizia rotundata	Roundleaf Errazurizia			S	SR	
Pediocactus peeblesianus var. peeblesianus	Peebles Navajo Cactus	LE			HS	
Sclerocactus whipplei	Whipple's Fishhook Cactus				SR	

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

Special Areas Documented within the Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Important Connectivity Zone	Wildlife Connectivity					
Little Colorado River	Apache/Navajo Counties Wildlife Movement Area - Riparian/Wash					

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

Species of Greatest Conservation Need Predicted within the Project Vicinity based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Anaxyrus microscaphus	Arizona Toad	SC		S		1B
Anodonta californiensis	California Floater	SC	S			1A
Antilocapra americana americana	American Pronghorn					1B
Aquila chrysaetos	Golden Eagle	BGA		S		1B
Aspidoscelis pai	Pai Striped Whiptail					1B
Baeolophus ridgwayi	Juniper Titmouse					1C
Buteo regalis	Ferruginous Hawk	SC		S		1B
Buteo swainsoni	Swainson's Hawk					1C
Callipepla squamata	Scaled Quail					1C
Castor canadensis	American Beaver					1B
Chordeiles minor	Common Nighthawk					1B
Corynorhinus townsendii pallescens	Pale Townsend's Big-eared Bat	SC	S	S		1B
Cynomys gunnisoni	Gunnison's Prairie Dog	SC		S		1B
Empidonax wrightii	Gray Flycatcher					1C
Euderma maculatum	Spotted Bat	SC	S	S		1B
Gymnorhinus cyanocephalus	Pinyon Jay			S		1B
Haliaeetus leucocephalus	Bald Eagle	SC, BGA	S	S		1A
Lasiurus blossevillii	Western Red Bat		S			1B
Melospiza lincolnii	Lincoln's Sparrow					1B

Species of Greatest Conservation Need Predicted within the Project Vicinity based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Mustela nigripes	Black-footed Ferret	LE,XN				1A
Myotis occultus	Arizona Myotis	SC		S		1B
Myotis yumanensis	Yuma Myotis	SC				1B
Neotoma stephensi	Stephen's Woodrat					1B
Oreoscoptes montanus	Sage Thrasher					1C
Perognathus flavus goodpasteri	Springerville Pocket Mouse	SC	S			1B
Rallus limicola	Virginia Rail					1C
Setophaga petechia	Yellow Warbler					1B
Spizella breweri	Brewer's Sparrow					1C
Sturnella magna	Eastern Meadowlark					1C
Tadarida brasiliensis	Brazilian Free-tailed Bat					1B
Troglodytes pacificus	Pacific Wren					1B
Vireo vicinior	Gray Vireo		S			1C
Vulpes macrotis	Kit Fox	No Status				1B

Species of Economic and Recreation Importance Predicted within the Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Antilocapra americana americana	America Pronghorn					1B
Cervus elaphus	Elk					
Odocoileus hemionus	Mule Deer					
Puma concolor	Mountain Lion					
Zenaida 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 potential introduction or spread of exotic invasive species. Invasive species can be plants, animals (exotic snails), and other organisms (e.g., microbes), which may cause alteration to ecological functions or compete with or prey upon native species and can cause social impacts (e.g., livestock forage reduction, increase wildfire risk). The terms noxious weed or invasive plants are often used interchangeably. Precautions should be taken to wash all equipment utilized in the project activities before leaving the site. Arizona has noxious weed regulations (Arizona Revised Statutes, Rules R3-4-244 and R3-4-245). See Arizona Department of Agriculture website for restricted plants, https://agriculture.az.gov/. Additionally, the U.S. Department of Agriculture has information regarding pest and invasive plant control methods including: pesticide, herbicide, biological control agents, and mechanical control, https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/quality/?cid=stelprdb1044769 The Department regulates the importation, purchasing, and transportation of wildlife and fish (Restricted Live Wildlife), please refer to the hunting regulations for further information https://www.azgfd.com/hunting/regulations.

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 herptefauna (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 (http://www.fws.gov/southwest/es/arizona/).

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:
HDMS records indicate that one or more native plants listed on the **Arizona Native Plant Law and Antiquities Act** have been documented within the vicinity of your project area. Please contact:
Arizona Department of Agriculture
1688 W Adams St.
Phoenix, AZ 85007
Phone: 602.542.4373
https://agriculture.az.gov/sites/default/files/Native%20Plant%20Rules%20-%20AZ%20Dept%20of%20Ag.pdf starts on page 44

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

Analysis indicates that your project is located in the vicinity of an identified ***wildlife habitat connectivity feature***. The **Statewide Wildlife Connectivity Assessment's Important Connectivity Zones** (ICZs) represent general areas throughout the landscape which contribute the most to permeability of the whole landscape. ICZs may be used to help identify, in part, areas where more discrete corridor modeling ought to occur. 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://s3.amazonaws.com/azgfd-portal-wordpress/azgfd.wp/wp-content/uploads/0001/01/23120719/ALIWCA_Final_Report_Perkl_2013_lowres.pdf.
Please contact the Project Evaluation Program (pep@azgfd.gov) for specific project recommendations.

APPENDIX C-3 – ARIZONA GAME AND FISH DEPARTMENT COMMENT LETTER

May 26, 2020

ATTN: Quentin Stuart
Invenergy
1401 17th Street, Suite 1100
Denver, CO 80202
RE: Hashknife Energy Center Special Use Permit

Re: **Arizona Solar Energy Project Discussion; Hashknife Solar Energy Project**

Dear Mr. Stuart,

The Arizona Game and Fish Department (Department) met with Invenergy on May 15, 2019 regarding the Hashknife Solar Energy Project in Navajo County. Based on this meeting, it is the Department's understanding Invenergy is proposing to construct a 300 MW DC Solar Farm on approximately 2,800 acres of land located on private and state lands. The project will be a photovoltaic solar facility which includes a Battery Energy Storage System and will connect to a 500kV generation tie line. Based on Invenergy's preliminary Tier 1 and Tier 2 review which included a site visit and habitat characterisation of the site, and the Department's knowledge of the site, there are no concerns for wildlife, including Wildlife Corridors, within this project location at this time.

Under Title 17 of the Arizona Revised Statutes, the Department, by and through the Arizona Game and Fish Commission (Commission), has jurisdictional authority and public trust responsibilities for management of the state's fish and wildlife resources. It is the mission of the Department to conserve Arizona's diverse fish and wildlife resources and manage for safe, compatible outdoor recreation opportunities for current and future generations. As such, the Department looks forward to continued coordination with Invernergy on this project as it develops. If you have any questions regarding this letter, please do not hesitate to contact me directly at acavalcant@azgfd.gov or 623-236-7222.

Sincerely,

Andrew Cavalcant
Project Evaluation Specialist

M19-09091424

cc: Ginger Ritter, Project Evaluation Program Supervisor AGFD (gritter@azgfd.gov)

Dave Dorum, Habitat Program Manager, Region I
Jamie Wilson, Senior Associate, Invenergy (JWilson@invenergullc.com)

EXHIBIT D – BIOLOGICAL RESOURCES

Arizona Revised Statutes (ARS) §40-360 et seq. established the Power Plant and Transmission Line Siting Committee in 1971. ARS §40-360.06(A)(2) stipulates "fish, wildlife, and plant life and associated forms of life on which they are dependent" are among the factors the Siting Committee must consider in reviewing CEC applications. As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

> "*List the fish, wildlife, plant life and associated forms of life associated with the vicinity of the proposed sites or route and describe the effects, if any, other proposed facilities will have thereon.*"

PROJECT AREA SETTING

The Project area traverses Great Basin Desert scrub and Plains and Great Basin Grassland,[24] with the Project area impacted by grazing livestock since approximately the 1880s. The elevation ranges from approximately 5,000 to 5,130 feet amsl. The Project area is located within portions of Township 17 North, Range 19 East; Township 18 North, Range 18 East; and Township 18 North, Range 19 East, Gila and Salt River Baseline and Meridian. The Project area is located on private property and Arizona State Trust Lands

Physical Setting

The biotic communities present within the Project area and out to a 2-mile buffer are classified as Great Basin Desert scrub and Plains and Great Basin Grassland. The site reconnaissance was conducted within the Project area and concluded that the dominant vegetation assemblage occurring within the Project area is Inter-Mountain Basins Semi-Desert Grassland. Also found within the Project area are Inter-Mountain Mixed Salt Desert Scrub, Southern Colorado Plateau Sand Shrubland, Inter-Mountain Basins Greasewood Flats, Inter-Mountain Basins Big Sagebrush, Inter-Mountain Basins Semi-Desert Shrub Steppe, and Invasive Southwest Riparian Woodland and Shrubland.

Vegetation

The Project area traverses Great Basin Desertscrub and Plains and Great Basin Grassland which is dominated by graminoids and forbs with an open shrub and tree layer. Characteristic grasses include Arizona threeawn (*Aristida arizonica*), blue grama (*Bouteloua gracilis*), sand dropseed (*Sporobolus cryptandrus*), and sixweeks threeawn (*Aristida adscensionis*). Scattered to locally dense shrubs include Bigelow sagebrush (*Artemisia bigelovii*), desert-thorn (*Lycium* sp.), fourwing saltbush (*Atriplex canescens*), Fremont's mahonia (*Mahonia fremontii*), rubber rabbitbrush (*Ericameria nauseosa*), Stansbury cliffrose (*Purshia stansburiana)*, Whipple cholla (*Cylindropuntia whipplei*), winterfat (*Krascheninnikovia lanata*), and yellow rabbitbrush (*Chrysothamnus viscidiflorus*). The tree layer is dominated by Utah juniper (*Juniperus osteosperma*) and oneseed juniper (*Juniperus monosperma*).

Along the existing transmission line, soils are sandy, but no dunes are present. No rock outcrops are found along the line. Within the proposed Project area, soils are also sandy, but rockier than those observed in the transmission line alignment. There are no dunes present, and no large trees. Rolling hills, small washes, and several low rock outcrops are found within the Project area. Table D-1 provides the acres of each landcover type within the Project area and 2-mile buffer.

Table D-1 lists species of plants observed during the reconnaissance survey of the Project area. Invasive

[24] Brown, D.E. (ed.). 1994. Biotic Communities: Southwestern United States and Northwestern Mexico. Salt Lake City: University of Utah Press.

species observed were camelthorn (*Alhagi maurorum*) and prickly Russian thistle (*Salsola tragus*).

Table D-1: Plant Species Observed in the Project Area and the Transmission Corridor

Scientific Name	Common Name
Aristida arizonica	Arizona threeawn
Bouteloua gracilis	blue grama
Sporobolus cryptandrus	sand dropseed
Aristida adscensionis	sixweeks threeawn
Salvia reflexa	lanceleaf sage
Artemisia bigelovii	Bigelow sagebrush
Lycium sp.	desert-thorn
Atriplex canescens	fourwing saltbush
Mahonia fremontii	Fremont's mahonia
Ericameria nauseosa	rubber rabbitbrush
Purshia stansburiana	Stansbury cliffrose
Cylindropuntia whipplei	Whipple cholla
Krascheninnikovia lanata	winterfat
Chrysothamnus viscidiflorus	yellow rabbitbrush
Juniperus osteosperma	Utah juniper
Juniperus monosperma	oneseed juniper
Cercocarpus montanus	alderleaf mountain mahogany
Yucca baccata	banana yucca
Bouteloua eriopoda	black grama
Gutierrezia sarothrae	broom snakeweed
Chamaebatiaria millefolium	desert sweet
Dyssodia papposa	fetid marigold
Sphaeralcea sp.	globemallow
Marrubium vulgare	horehound
Pleuraphis jamesii	James' galleta
Ephedra sp.	jointfir
Echinocereus mojavensis	Mohave kingcup cactus
Yucca angustissima	narrowleaf yucca
Opuntia sp.	pricklypear
Argemone sp.	pricklypoppy
Nolina microcarpa	sacahuista
Alhagi maurorum	camelthorn
Salsola tragus	prickly Russian thistle
Descurainia pinnata	western tansymustard

Wildlife Species

This section describes the wildlife species that may be present in the Project area and two-mile buffer. Although the Project area is largely disturbed grassland, some mobile or disturbance-tolerant wildlife species may occur within the Project area and two-mile buffer. As the Project area and two-mile buffer contain Great Basin Desertscrub and Plains and Great Basin Grassland biotic communities, it is anticipated that wildlife species (not already included in Exhibit C) that may occur would be those associated with these communities. The number of species, however, in any location or at any one time would be a small proportion of the species discussed here.

Mammals

Mammals associated with the Great Basin desertscrub and plains and grassland habitats of the Project area and not already included in Exhibit C include big game species such as mule deer (*Odocoileus hemionus*) and mountain lion (*Puma concolor*), and medium-sized species such as coyote (*Canis latrans*), badger (*Taxidea taxus*), gray fox (*Urocyon cinereoargenteus*), and black-tailed jackrabbit (*Lepus californicus*). Smaller species may include desert cottontail (*Sylvilagus audubonii*). Squirrel and rodent species may include woodrat (*Neotoma* sp.), kangaroo rat (*Dipodomys* sp.), ground squirrel (*Ammospermophilus* sp. and *Spermophilus* sp.), pocket gopher (*Geomys* sp.), deer mouse (*Peromyscus* sp.), pocket mouse (*Perognathus* sp.), harvest mouse (*Reithrodontomys* sp.), vole (*Microtus* sp.), shrew (*Sorex* sp.), and numerous bat species. Non-native species of rat (*Rattus* sp.) and mice (*Mus* sp.) may be present in the residential and commercial developments of the Project area and two-mile buffer.

Birds

Bird species associated with the Great Basin desertscrub and plains and grassland habitats of the Project area and not already included in Exhibit C include raptors such as merlin (*Falco columbarius*), northern harrier (*Circus hudsonius*), prairie falcon (*Falco mexicanus*), red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), great horned owl (*Bubo virginianus*), and common nighthawk (*Chordeiles minor*). Non-raptor species include common raven (*Corvus corax*), horned lark (*Eremophila alpestris*), chestnut-collared longspur (*Calcarius ornatus*), black-throated sparrow (*Amphispiza bilineata*), cliff swallow (*Petrochelidon pyrrhonota*), rock wren (*Salpinctes obsoletus*), northern mockingbird (*Mimus polyglottos*), loggerhead shrike (*Lanius ludovicianus*), blue-gray gnatcatcher (*Polioptila caerulea*), meadowlark (*Sturnella* sp.), warblers (*Setophaga* sp.), sparrows (*Zonotrichia* sp.), vireo (*Vireo* sp.), dove, western tanager (*Piranga ludoviciana*), ash-throated flycatcher (*Myiarchus cinerascens*), western wood pee-wee (*Contopus sordidulus*). Bird species that may be present near riparian habitats along the Little Colorado River include spotted sandpiper (*Actitis macularius*), northern shoveler (*Spatula clypeata*), green-tailed towhee (*Pipilo chlorurus*), black phoebe (*Sayornis nigricans*), Bewick's wren (*Thryomanes bewickii*), and flycatchers. Non-native species include European starling (*Sturnus vulgaris*) and rock dove (*Columba livia*) may be present near residential and commercial developments of the Project area and two-mile buffer.

Reptiles

Reptile species associated with the Great Basin desertscrub and plains and grassland habitats of the Project area and not already included in Exhibit C include snake, turtle, and lizard species such as gopher snake (*Pituophis catenifer*), glossy snake (*Arizona elegans*), striped whipsnake (*Coluber taeniatus*), corn snake (*Elaphe guttata*), Chihuahuan nightsnake (*Hypsiglena jani*), common kingsnake (*Lampropeltis getula*), gartersnake species (*Thamnophis* sp.), milksnake (*Lampropeltis triangulum*), and rattlesnake species (*Crotalus* sp.); western box turtle (*Terrapene ornata*); collared lizard (*Crotaphytus collaris*), long-nosed leopard lizard (*Gambelia wislizenii*), common lesser earless lizard (*Holbrookia maculata*), greater short-horned lizard (*Phrynosoma hernandesi*), southwestern fence lizard (*Sceloporus cowlesi*), common sagebrush lizard (*Sceloporus graciosus*), desert spiny lizard (*Sceloporus magister*), plateau fence lizard (*Sceloporus tristichus*), ornate tree lizard (*Urosaurus ornatus*), common side-blotched lizard (*Uta stansburiana*), many-lined skink (*Plestiodon multivirgatus*), Pai striped whiptail (*Aspidoscelis pai*), and plateau striped whiptail (*Aspidoscelis velox*). Non-native species of turtle (pond slider [*Trachemys scripta*] and lizard (Mediterranean gecko [*Hemidactylus turcicus*]) may be present within and adjacent to the residential and commercial developments of the Project area and two-mile buffer.

Amphibians
Aquatic habitats that may support amphibian species within the Project area and two-mile buffer largely consists of the Little Colorado River and constructed water impoundments (such as Cholla Lake) and adjacent areas. Native amphibian species that may be present within the Project area and not already included in Exhibit C-3 include canyon treefrog (*Hyla arenicolor*), Great Plains toad (*Anaxyrus cognatus*), red-spotted toad (*Anaxyrus punctatus*), Woodhouse's toad (*Anaxyrus woodhousii*), plains spadefoot toad (*Spea bombifrons*), Mexican spadefoot (*Spea multiplicata*), and barred tiger salamander (*Ambystoma mavortium*). Non-native species of amphibian (American bullfrog [*Lithobates catesbeianus*]) may be present throughout aquatic habitats of the Project area and two-mile buffer.

Fish
Aquatic habitats within the Project area and two-mile buffer largely consist of the Little Colorado River and constructed water impoundments (such as Cholla Lake). Aquatic habitats suitable for many native fish species would be limited to the Little Colorado River. Species that may be present in aquatic habitats within the Project area and not already included in Exhibit C include speckled dace (*Rhinichthys osculus*), flannelmouth sucker (*Catostomus latipinnis*), and bluehead sucker (*Catostomus discobolus*). Other fish species that may be present in the aquatic habitats of the project area include non-native sport fishes (such as various species of trout and channel catfish [*Ictalurus punctatus*]) that are stocked for recreational fishing.

SUMMARY OF POTENTIAL IMPACTS

Potential Impacts to Non-Bat Mammals
Construction-related activity and noise may disturb species in the area and cause them to avoid or move away from the Project area or temporarily alter their behavior in other ways (e.g., remain underground). Once construction is completed, it is expected that wildlife will return to the area and resume normal behavior patterns. Transmission lines do not appear to affect most wildlife movements, including those of antelope, deer, and elk.[25, 26, 27]

Potential Impacts to Birds
Because of the abundance of similar habitat in the surrounding area, the impacts on the bird populations that would utilize those habitat types within the proposed Project area is low.

The effects of exposure to electromagnetic fields (EMF) by birds nesting near power lines is largely unknown. Transmission lines pose a risk of collisions and electrocution for birds, particularly eagles and other raptors. To minimize that risk, BMPs will be applied, including transmission structures meet Avian Powerline Interaction Committee (APLIC) standards (APLIC 2012[28]). When these standards are met, the risk of electrocution for large birds, including all special-status species in the Project area, is essentially eliminated.

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[25] Goodwin, J. 1975. Big game movement near a 500-kV transmission line in northern Idaho. Bonneville Power Administration unpublished report. Portland, Oregon.

[26] Lee, J.M., and BPA Biological Studies Task Team. 1989. *Electrical and Biological Effects of Transmission Lines: A Review*. Portland, Oregon: Bonneville Power Administration. Available at: https://www.osti.gov/servlets/purl/5712107. Accessed June 2019.

[27] Thompson, L.S. 1977. *Overhead Transmission Lines: Impact on Wildlife*. Research Report No. 2. Helena: Montana Department of Natural Resources and Conservation.

[28] Avian Powerline Interaction Committee (APL1C). 2012. Reducing Avian Collisions with Powerlines: the State Art in 2012. Edison Electric Institute, and APLIC, Washington, DC. 184 pp.

Burrowing owls can use nests in disturbed areas used for livestock grazing. Burrowing owls in some cases retreat underground when alarmed rather than fly, and because their burrows are underground, they are at risk of harm from ground-disturbing activities such as those resulting from construction of the Project. No burrowing owls were observed during the reconnaissance survey but could occupy the Project area prior to construction.

No birds are regularly dependent on the disturbed habitat present in the Project area. Although some ground disturbances and vegetation removal would occur as a result of the Project, this is not likely to have a detectable effect on any bird species.

Potential Impacts to Bats

Impacts of the Project on bats are expected to be negligible because bats are well adapted to avoid stationary objects by using echolocation. During normal foraging activity, bats are actively using echolocation and are typically able to detect and avoid features such as overhead transmission lines. Ground disturbance from the Project, taking place in previously disturbed areas with little vegetation, would not appreciably affect any bat species by removing foraging habitat.

Potential Impacts to Reptiles

Construction-related activity and noise may disturb species in the area and cause them to avoid or move away from the Project area or temporarily alter their behavior in other ways (e.g., remain underground).

Potential Impacts to Amphibians

Amphibian species are not expected to be affected by the Project because 1) no ground disturbance is planned to take place in or near aquatic habitats where amphibians may occur, and 2) no ground disturbance will take place in or near the Little Colorado River where amphibians likely occur.

Potential Impacts to Fish

No ground disturbance will take place in or near the river. Standard BMPs will be employed during construction to prevent contamination of stormwater runoff from the Project.

Potential Impacts to Vegetation

Construction within the proposed Project area will result in the long-term removal of a small amount of vegetation. Native vegetation characteristic of Great Basin Desert scrub and Plains and Great Basin Grassland is extensive in northern Arizona, and the acreage of disturbance as a percentage of the remaining habitat is small. The removal of vegetation will not result in significant impacts to the vegetation communities as a whole. Standard BMPs will be employed during construction to minimize the introduction and spread of noxious weeds.

Removal of vegetation associated with clearing portions of the transmission line right-of-way (ROW) and placement of support structures would result in a small loss of habitat that could provide nesting sites, cover, and/or forage for bird and mammal species or their prey. In temporarily disturbed areas along the transmission line ROW, species composition of birds and mammals using those areas may change over time as vegetation species and structure recover. The acreage of vegetation to be cleared is small, particularly relative to the large amount of comparable habitat available in and around the Project area footprint. Removal of vegetation is expected to have negligible effect on wildlife species. There would be no habitat fragmentation or edge effects from clearing portions of the transmission ROW or placement of support structures.

MITIGATION

Because the Project area is largely located in areas subject to previous disturbance and outside of areas that provide essential habitat for native wildlife, impacts to most species present in the region would not occur or would not rise to a level that would warrant mitigation. The following measures address the loss of native vegetation, risk that electrical infrastructure poses to special-status birds, and the risk that ground-disturbing activities pose to burrowing owls:

- A Notice of Intent to Clear Land would be filed with the Arizona Department of Agriculture
- Transmission structures meet Avian Powerline Interaction Committee (APLIC) standards (APLIC 2012[29]). When these standards are met, the risk of electrocution for large birds, including all special-status species in the Project area, is essentially eliminated.
- Preconstruction surveys for burrowing owls would be conducted by qualified biologists according to current protocol[30]. Burrows occupied by burrowing owls would be avoided if feasible. If any burrowing owl relocation is necessary, this would be performed by a licensed wildlife rehabilitator.

CONCLUSION

The proposed Project is not likely to significantly contribute to the loss of native vegetation that provides wildlife habitat or declines in any native plant or wildlife species. The risk that electrical infrastructure poses to birds would be addressed by following standard APLIC guidelines as design features for the Project, and preconstruction surveys for the burrowing owl would address potential impacts to that species

[29] Avian Powerline Interaction Committee (APL1C). 2012. Reducing Avian Collisions with Powerlines: the State Art in 2012. Edison Electric Institute, and APLIC, Washington, DC. 184 pp.

[30] Arizona Game and Fish Department (AGFD). 2009. Burrowing Owl Project Clearance Guidance for Landowners. Arizona Burrowing Owl Working Group. 9 pp.

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

Arizona Revised Statutes (ARS) §40-360 et seq. established the Power Plant and Transmission Line Siting Committee in 1971. ARS §40-360.06(A)(5) stipulates "existing scenic areas, historic sites and structures or archaeological sites at or in the vicinity of the proposed site" are among the factors the Siting Committee must consider in reviewing CEC applications. The Arizona Corporation Commission (ACC) Rules of Practice and Procedure R14-3-219 that implement ARS §40-360 et seq. stipulate that applications for CECs must:

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

Exhibit E includes summaries of existing visual and cultural resources, and the potential impacts the Project may have on each one. Figures E-1 through E-3 are included at the end of this Exhibit and display the visual and cultural resources described below. Appendix E-1 includes photo simulations of the both the preferred and alternative routes.

SCENIC AND VISUAL RESOURCES

Overview

Exhibit E addresses the inventory and assessment of scenic areas including landscape scenery and sensitive views that may be affected by the construction and operation of the Project. The methodology for this assessment is provided below, and includes separate discussions for landscape scenery (e.g., scenic quality) and sensitive viewers. The Project would not cross lands managed by the BLM, United States Forest Service, or any other agencies that require conformance with visual resource management objectives or management guidelines. Navajo County has guidelines for managing and preserving scenic areas in their Comprehensive Plan. However, the guidelines are not directly applicable to the Project area due to the lack of existing or proposed parks, recreation, or preservation areas.

Methodology

The purpose of the scenic areas assessment is to identify and characterize the level of visual modification in the landscape that would result from the construction and operation of the Project. Modification of the landscape is described in levels of visual contrast, which can potentially affect both landscape scenery (i.e., scenic quality) and sensitive viewers. The methods used to conduct the visual inventory are consistent with past visual resource studies conducted for similar projects that have been approved by the Siting Committee.

The visual assessment completed within the Project Study Area was defined as a two-mile wide radius from the preferred and alternate Gen-tie corridors. Visual resource data for this assessment was developed on research including Navajo County Comprehensive Plan, Geographic Information System (GIS) data, aerial photography, and on-site field verification and photo documentation. These data were used to develop a comprehensive understanding of the existing and future visual resources in the vicinity of the Project.

Impacts to both scenic quality and sensitive viewers are determined, by evaluating the visual contrast the proposed facilities (e.g. structures/pads, conductor, roads) would have with the existing landscape.

Visual contrast refers to the degree that the Project features would either match or repeat existing features in the landscape, or contrast with features of the existing landscape, including the developed areas (e.g., Cholla Generating Station). The degree of visual contrast considers the existing landforms, vegetation, and built features present in the landscape, and is described in terms of the degree of perceptible change in the basic design elements of form, line, color, and texture that would be evident by the introduction of the Project in the landscape.

The impact thresholds for this assessment are categorized as follows:

- **High:** Project features would result in a strong degree of contrast and would appear as a dominant feature within the existing landscape.
- **Moderate:** Project features would result in a modest degree of contrast and would appear as co-dominant features within the existing landscape.
- **Low:** Project features would result in a weak degree of contrast and would be subordinate to the features of the existing landscape.

Landscape Scenery

Landscape Scenery is a measure of the inherent aesthetic value of the landscape based on the appearance of existing landscape features, including landforms, vegetation, and built features. In general terms, the scenic quality is based on the premise that landscapes with greater diversity in landforms and vegetation are more aesthetically pleasing, and therefore hold greater value. For this analysis, impacts to scenic quality were based on comparing the inventoried quality of the scenery to the anticipated quality of the scenery considering any contrast related to construction of the Project.

Sensitive Viewers

Sensitive viewers are those locations where viewers would be the most susceptible to the change in the landscape viewshed related to construction of the Project. Project contrast for sensitive viewer is dependent on several other factors, including viewing distance, duration of view, viewing condition, and degree of visibility. When combined, these factors indicate the overall visual dominance of the Project within the landscape viewshed. The term viewing distance refers to the viewer's physical distance from the Project component and is predicated on the fact that one's ability to see details dissipates over distance. The duration of view refers to the length of time that the Project would be viewed and is based on the idea that viewer attention is attracted more as the duration of the view increases. Viewing conditions refer to whether the viewer is perceives the Project from a higher elevation, flat, or lower elevation. The degree of visibility refers to whether views of the Project components would be either open and unobstructed, or else partially or even fully obstructed by other features in the existing landscape (i.e., topography, vegetation, or built features). The degree of visibility also refers to whether the Project components would be viewed against the sky or viewed against a backdrop of landforms and/or vegetation.

Potential viewer sensitivities are also discussed within the analysis, including brief discussions regarding the potential sensitivities of different types of viewers within the Project vicinity. Residential and recreational users are generally considered to have high sensitivities to visual changes in the landscape, while viewers on commuter travel routes are considered to have moderate sensitivities to visual changes in the landscape.

INVENTORY RESULTS

Landscape Scenery

The Study Area falls within the Arizona/New Mexico Plateau Level III Ecoregion and more specifically the Northeast Arizona Shrub-Grasslands Level IV Ecoregion, where elevations typically range between 4800 to 6200 feet.

The terrain can vary from relatively flat to rolling plateaus and grasslands, with some areas of higher

topographic relief from smaller ridges, hills, and rock outcrops, which are often dissected by numerous drainages and washes, including the Little Colorado River.
Vegetation can include shadscale, fourwing saltbush, Mormon tea, Indian rice grass, blackbrush, galleta, and blue grama, and black grama (USEPA 2013).

Landscape Scenery in the Study Arca consists of numerous five units each with distinctive physical characteristics that define the overall scenic quality within the unit. The scenic quality units shown on Figure E1 are described in the following table.

Table E- 1: Scenic Quality Unit Descriptions

Scenic Quality Unit	Classification	Description
Little Colorado River Floodplain (Photo 1)	A	A broad relatively flat floodplain located on either side of the well-defined and moderately deep Little Colorado River channel. The floodplain consists of a mixture of sandy and clays soils with some areas of exposed rock mostly of monotone tan colors. Vegetation in the floodplain is a mixture of willows, tamarisk and grasses adding color and texture when to the landscape. Water is ephemeral, present mostly due to Spring runoff and heavy rainfall also adding color, uniqueness, and diversity to the landscape.
Dissected Plateau (Photo 2)	B	A rolling plateau featuring ridgelines, rock outcrops, and small ephemeral drainages cutting through the softer soils. The soils range from a diverse orange to tan colors, as well as dark brown and black colors where the rock outcrops are located. Vegetation is relatively sparse and low growing consisting of small grasses and shrubs adding contrasting color and texture with the soils.
Sage Grassland (Photo 3)	C	Relatively flat terrain with tan to whitish/gray alkali soils interspersed with a low to moderate dense cover of grasses and shrubs adding contrasting color and texture.
Meadowland (Photo 4)	C	Low lying depression with tan to whitish/gray alkali soils with a moderately dense to dense cover of grasses and heavy tamarisk adding contrasting color and texture.
Developed (Photo 5)	D	Rural ranches and associated outstructures, corrals, water tanks; mixed used residential and commercial areas within Joseph City; Cholla Power Plant/Substation each exhibiting numerous structures consisting of a wide range of colors, textures, uniqueness.

There are numerous high voltage transmission lines crossing through the study area and connecting into the Cholla Substation and distribution lines connecting rural residences, water wells, and communication facilities. The large-scale transmission lines are dominant features in the landscape and detract from the scenic quality of the natural setting. This is especially true where they cross Obed road and converge near the Little Colorado River. The railroad and Cholla Power Plant are additional dominant industrial facilities located near the Little Colorado River (Photo 6).

Sensitive Viewers

There are two primary sensitive viewers types in the study area including residences and travel routes. Residential viewers are located in two areas including residences located approximately 1 mile north of the preferred transmission line route between I-40 and the railroad tracks. Views from these residences are partially screened due to existing foreground vegetation along the Little Colorado River and due to existing utility lines and railroad bed. There are three residences located at the Obed Ranch located approximately ½ mile north of the alternative transmission line route and ½ mile east of Obed Road. Views from the Obed Ranch residences would be open viewing through three existing high voltage transmission lines, one of which is in the foreground closest to the residences.

Travel routes include I-40, Obed Road, and McLaws/Territorial Road. Views from Obed Road range from approximately 0 - 1+ miles away for both the preferred and alternative routes as the road would travel underneath both transmission line routes (Appendix E-1). Views from I-40 would be approximately 1/2 - 1+ miles away from both the preferred and alternative transmission line routes where they connect into the existing Cholla substation. Views of the alternative transmission line route from McLaws/Territorial Road are approximately 1+ miles away and would be through three existing high voltage transmission lines.

There are also less defined sensitive viewers associated with dispersed recreation uses such as hiking, hunting, all-terrain vehicle, and equestrian activities. These activities are relatively low volume and could potentially occur in areas where views of the proposed and alternatives transmission line route would be within approximately 0 – 1+ miles, for example along the Little Colorado River.

Photo 1 – Little Colorado River Floodplain

Photo 2 – Dissected Plateau

Photo 3 – Sage Grasslands

Photo 4 – Meadowlands

Photo 5 – Development at Cholla Power Plant

Photo 6 – Existing Transmission Lines

Photo 7 – View of Preferred and Alternative Transmission Line Routes from Residences south of I-40

Photo 8 – View of Alternative Transmission Line Route from Obed Ranch Residences

IMPACT ASSESSMENT RESULTS

The potential impacts on landscape scenery and sensitive viewers based on the construction and operation of the Project are described below. Overall, impacts associated with the Project are expected to be minimal because the rural landscape setting and low number of sensitive viewers that would see the project, as well as the existing high voltage transmission lines, and Cholla Power Plant/Substation that dominant features visible in the landscape throughout the Study Area.

Landscape Scenery

Impacts to the Little Colorado River floodplain (Scenic Quality Class A) landscape at approximately milepost 2.1 to 2.7 would be moderate-high along the preferred transmission line route where the crossing would be in a new location. However, the presence of other nearby transmission lines, distribution lines and the railroad would reduce the overall level of visual contrast in the landscape in this location. Impacts would be low along the alternative route from approximately milepost 2.6 to 3.0 where it would parallel two existing high voltage transmission lines.

Impacts to the dissected plateau (Scenic Quality Class B) landscape at approximately mileposts 0.0 – 0.5 and 1.0 – 1.2 would be moderate along the preferred alternative where the line would cross in a predominantly natural setting. Impacts would be low-moderate where the alternative transmission line would cross through the dissected plateau at approximately milepost 0.0 – 0.2.

Low-moderate impacts to the sage grassland (Scenic Quality Class C) landscape would occur from approximately milepost 0.5 – 1.0 and 1.2 to 2.1 along the preferred alternative. Low impacts to the sage grassland and lowland (Scenic Quality Class C) would occur along the alternative transmission line route from approximately milepost 0.2 to 2.6.

Sensitive Viewers

Impacts to residential viewers along the preferred transmission line route would be low to views approximately 1 mile away from approximately milepost 0 – 2.3 due to the relatively long viewing distance and partial screening from foreground vegetation and infrastructure. Low impacts would occur from the Obed Ranch residences along the alternative transmission line from approximately milepost 0.5 to 2.5. Visual contrast from the Obed Ranch residences would be low due to the presence of three existing high voltage transmission lines and viewing distance ranging from approximately ½ to 1+ miles away.

Impacts to views along Obed Road along the preferred transmission line route would be moderate high at approximately milepost 1.8 to 2.2 where the route would cross in an open natural landscape setting (Appendix E-1). Impacts along the preferred route would be moderate at distances of ¼ to ½ mile from the road and low moderate at distances beyond ½ mile. Impacts to views along Obed Road along the alternative transmission line route would be low at approximately milepost 0.9 to 1.4 where the route would cross in an existing high voltage transmission line corridor (Appendix E-1) where visual contrast would be low. Impacts at distances beyond ¼ mile would be negligible because of increased viewing distance and presence of existing transmission lines.

Impacts to views from I-40 approximately ½ mile away would be low to negligible due to viewing the preferred and alternative transmission line routes adjacent to an existing high voltage transmission line corridor near the interconnection point at the Cholla Power Plant/Substation.
Impacts to views from McLaws/Territorial Road would be low to negligible due to viewing the alternative transmission line route in an existing high voltage transmission line corridor from a distance 1+ miles away.

HISTORIC SITES AND STRUCTURES, AND ARCHEOLOGICAL SITES

As required by the Arizona Corporation Commission Rules of Practice and Procedure R14-3-219, the potential effects of the proposed Project on historic sites and structures and archaeological sites were assessed. The assessment also was prepared to support Arizona Corporation Commission compliance with the State Historic Preservation Act (Arizona revised Statutes 41-861 through 41-864), which requires state agencies to consider impacts of their programs on historic properties listed in or eligible for listing in the Arizona Register of Historic Places (ARHP), and to provide the State Historic Preservation Office an opportunity to review and comment on actions that affect such historic properties.

To be eligible for the ARHP, a property must be at least 50 years old (less, if they have special significance) and have national, state, or local significance in American history, architecture, archeology, engineering, or culture. They should also possess integrity of location, design, setting, materials, workmanship, feeling, and association, and meet at least one of the four following criteria:

- Criterion (a): be associated with significant historical events or trends
- Criterion (b): be associated with historically significant persons
- Criterion (c): have distinctive characteristics of a style or type, or have artistic value, or represent a significant entity whose components may lack individual distinction
- Criterion (d): have yielded or have potential to yield important information concerning history or prehistory.

Historic Sites

Five known historic sites, structures, or archaeological sites were in the Study Area by consulting the following sources:

- ARHP
- AZSITE database
- Historic General Land Office (GLO) plats
- Historic Land Patents
- Historic U.S. Geological Survey (USGS) topographic quadrangle maps
- National Register of Historic Places (NRHP)
- Cemetery locations
- Reports of previous cultural resources surveys in the vicinity
- Tribal Responses to Consultation Letters

There are three historic sites within the Study Area: the central Hashknife Ranch area, the remains of Obed Fort, and a foundation of an unknown structure. The Hashknife Ranch, AZ P:3:1 (Arizona State Museum [ASM]), was recorded in 1961 and was recommended to need additional information until a formal recommendation could be made on its eligibility. The Obed Fort, site AZ P:3:33 (ASM), served as one of the earliest Mormon settlements in the Little Colorado River Valley and, for a while, the original headquarters for the Hashknife Ranch. The fort was subjected to limited testing in 1995 by the Arizona Archaeological Society and was recommended for listing on the NRHP. In 1979, site AZ P:3:6 (ASM), a cut-rock foundation, was recorded, and it may be associated with the Hashknife Ranch, this site was recommended to be not eligible for listing on both the ARHP and the NRHP.

Historic Structures

No historic structures have been previously recorded within the Study Area.

Archaeological Sites

There are two known archaeological sites in the Study Area; all are Native American sites associated with the Ancestral Puebloans and consist of artifact scatters. Site AZ P:3:7 (ASM) was recorded as a lithic resource area with associated artifact scatter, the site was not evaluated during the original recording efforts in 1974. Site NA14217 was recorded as a ceramic scatter, there is no data in AZSITE about the site's eligibility.

Assessment of Effects

A project can have direct and/or indirect effects of historic sites and structures and archaeological sites when it alters the characteristics that qualify if for listing in the ARHP. Effects are adverse when they diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects of historic properties include but are not limited to:

- physical destruction of or damage to all or part of the property
- removal of the property from its historic location
- change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance
- introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic characteristics
- neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe
- transfer, leaser, or sale of property out of government ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

Direct Effects

Direct effects would include the areas that would be disturbed by construction and operation of the proposed Gen-ties, including transmission structure locations and any access roads.

The only historic site, structure, or archaeological sites in the area of direct effects is the central area of the Hashknife Ranch. No trace of the site remains today, so it would not be directly affected by the Project.

Indirect Effects

The remaining four historic sites, structures, or archaeological sites are outside the area of direct effects. Although the construction of the Project would indirectly introduce a visual element to the area, it would be restricted to the vicinity of the existing transmission lines, which are much larger in scale, so it would not significantly diminish their visual integrity. A visual study was done at the Obed Fort site and it was determined that the historic visibility from the site has already been compromised by the installation of the earlier transmission lines.

Conclusion

Based for the foregoing information, the Project is not expected to directly or indirectly affect historic sites, structures, or archaeological sites.

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USGS. 2018. Joseph City, AIZ, 7.5" Quadrangle, 1:24,000 scale.

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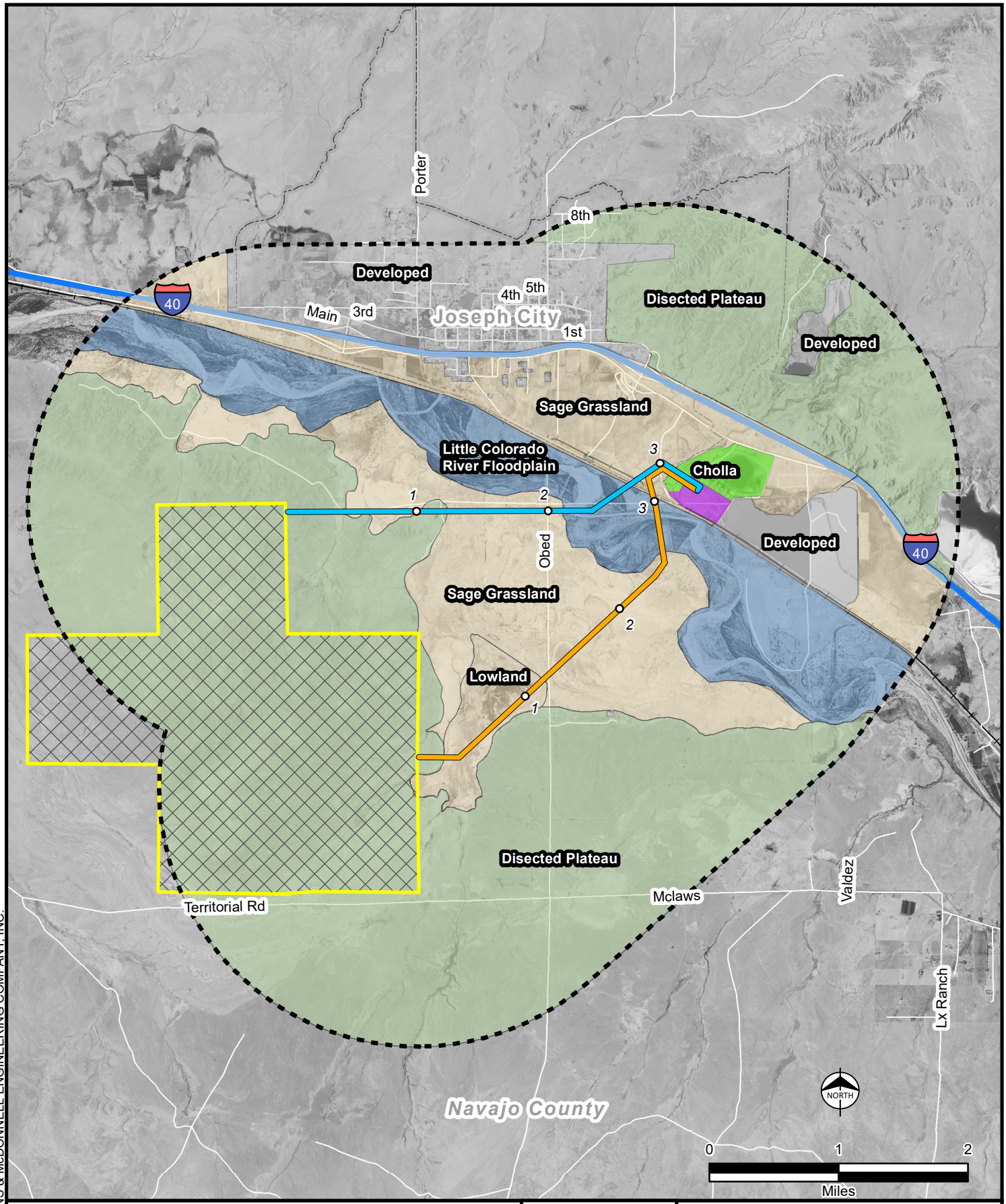


Project Features
- Project Area 2 Mile Buffer
- Hashknife Energy Center LLC
- Cholla Power Plant
- Cholla Substation

Proposed Transmission Line Route
- Preferred
- Alternate

Landscape Class
- A
- B
- C
- D

Reference Features
- Interstate
- Highway
- Local Road
- Rail Road
- City Limts

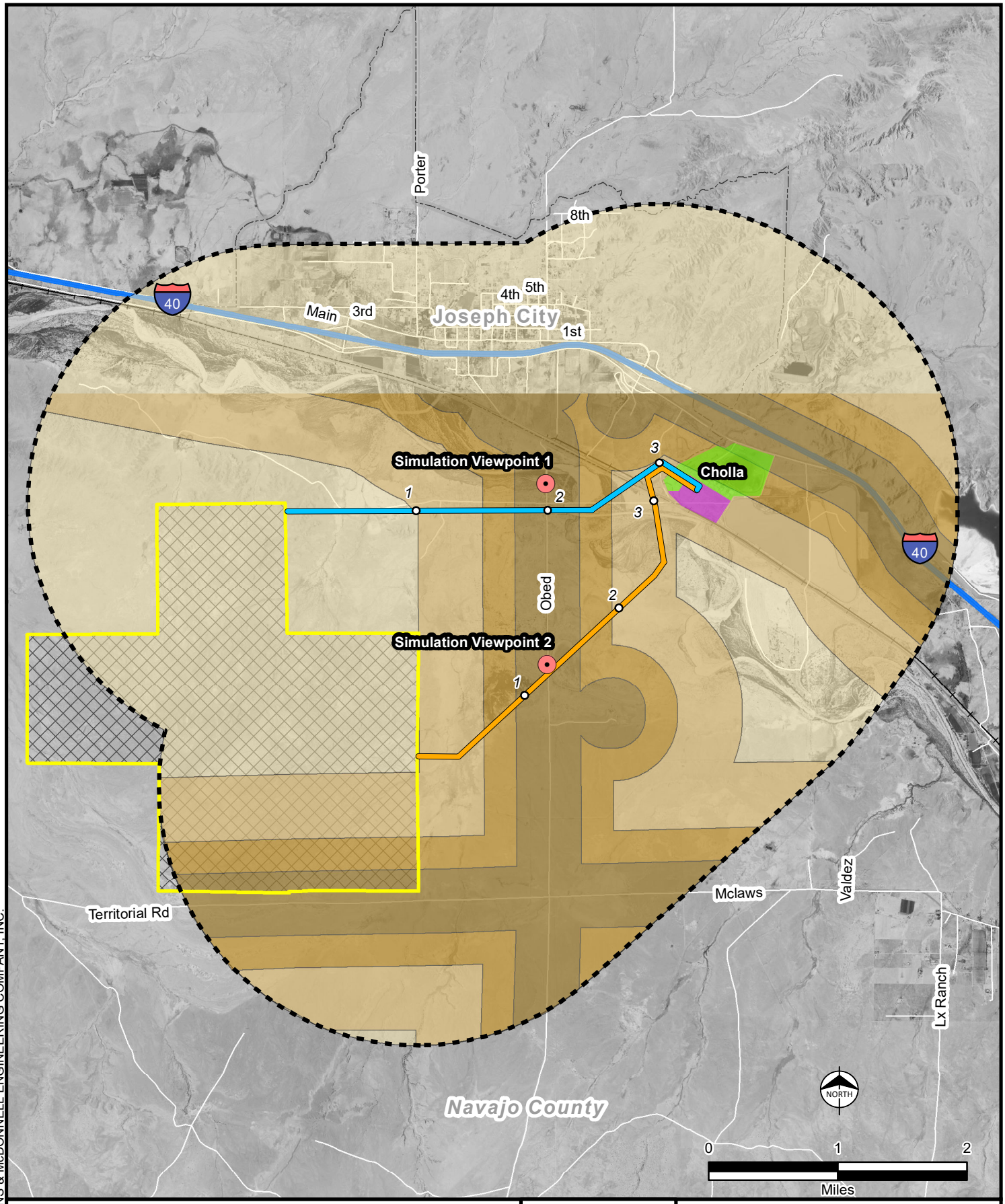
Invenergy

BURNS McDONNELL

E-1
Scenic Quality
Hashknife Energy Center LLC
Navajo County
Joseph City, Arizona

Source:Energy Velocity, Invenergy, Burns & McDonnell Engineering, Inc.

Issued: 8/7/2020



Project Features
- Project Area 2 Mile Buffer
- Hashknife Energy Center LLC
- Cholla Power Plant
- Cholla Substation

Proposed Transmission Line Route
- Preferred
- Alternate

Visual Distance Buffers
- 0-1/4 mile
- 1/4-1/2 mile
- 1/2-1 mile
- > 1 mile
- Simulation Viewpoint

Reference Features
- Interstate
- Highway
- Local Road
- Rail Road
- City Limts

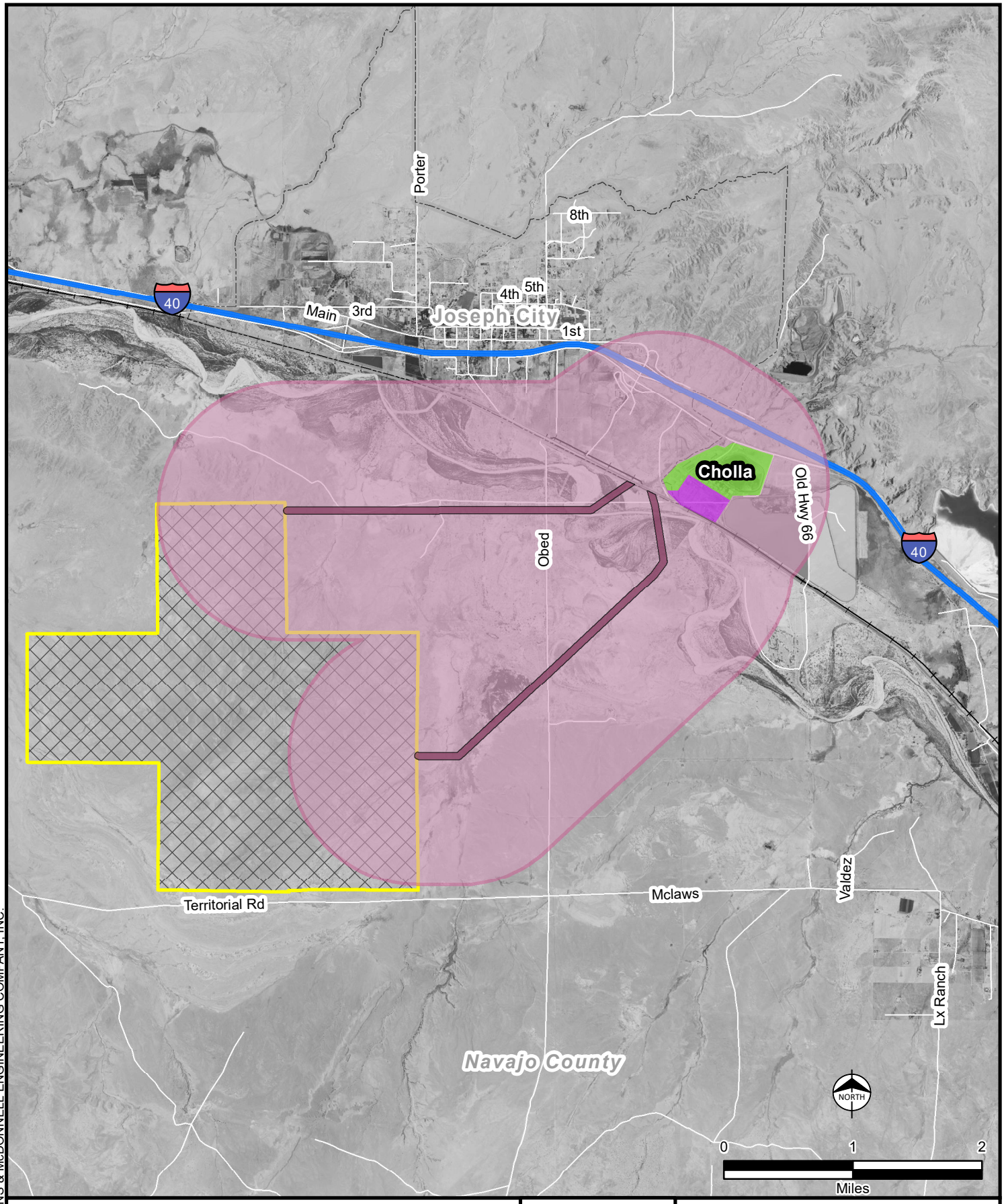
Invenergy

BURNS McDONNELL

E-2
Viewpoints
Hashknife Energy Center LLC
Navajo County
Joseph City, Arizona

Source:Energy Velocity, Invenergy, Burns & McDonnell Engineering, Inc.

Issued: 8/7/2020



Project Features
- Hashknife Energy Center LLC
- Power Plant
- Existing Substation

Cultural Survey Areas
- Class I Survey
- Pedestrian Survey

Reference Features
- Interstate
- Highway
- Local Road
- Rail Road
- City Limts

Invenergy

BURNS McDONNELL

E-3
Cultural Resource Survey
Hashknife Energy Center LLC
Navajo County
Joseph City, Arizona

Source:Energy Velocity, Invenergy, Burns & McDonnell Engineering, Inc.

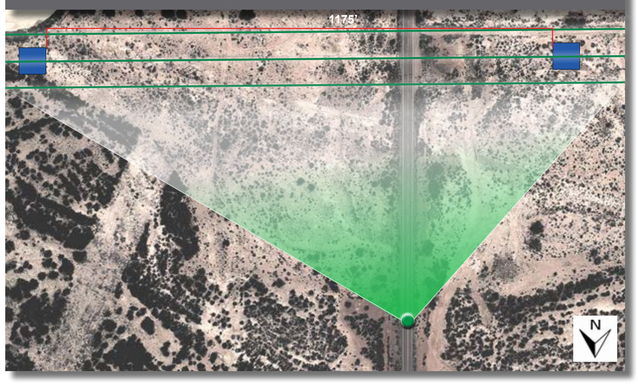
Issued: 8/7/2020

APPENDIX E-1 – PHOTO SIMULATIONS

Simulation #1

PREFERRED ROUTE FROM OBED ROAD

Viewing Location Simulated



Typical 500kV Structures

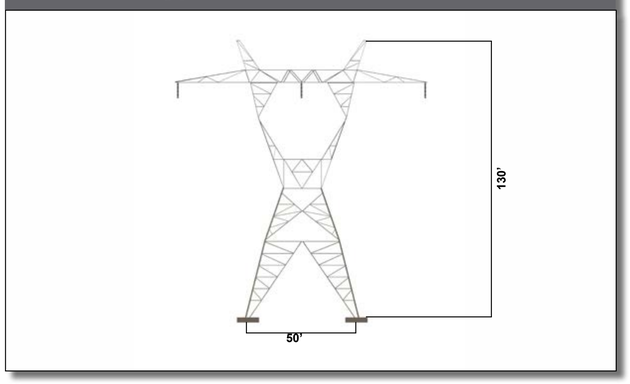


Photo Date and Time: April 3, 2020, 1:55 p.m.

Conditions: Clear, mostly sunny, light winds, low humidity

Camera Lens Focal Length = 50mm: The original photographs were taken at 50mm or 50mm equivalent, then stitched together to create this panorama, resulting in a 80-degree field of view.

View Location: Viewing south from Obed Road, distance to nearest facility from photo location is approximately 800 feet.

Simulations were prepared using preliminary engineering and design data. Facility locations, colors, and height/widths may differ based on final engineering and design.

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JOSEPH CITY, ARIZONA

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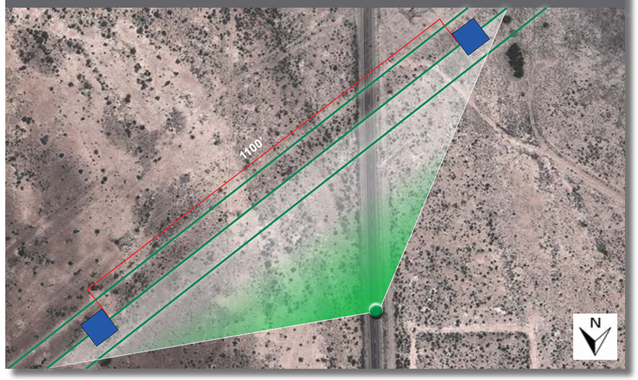
Simulation #2

ALTERNATIVE ROUTE FROM OBED ROAD

Viewing Location Simulated



Typical 500kV Structures

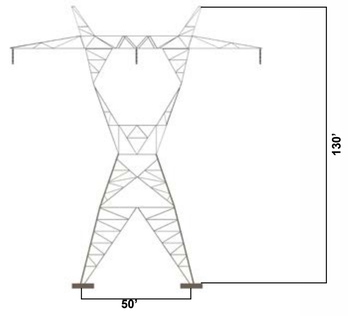


Photo Date and Time: April 3, 2020, 1:38 p.m.

Conditions: Clear, mostly sunny, light winds, low humidity

Camera Lens Focal Length = 50mm: The original photographs were taken at 50mm or 50mm equivalent, then stitched together to create this panorama, resulting in a 130-degree field of view.

View Location: Viewing south from Obed Road, distance to nearest facility from photo location is approximately 600 feet.

Simulations were prepared using preliminary engineering and design data. Facility locations, colors, and height/widths may differ based on final engineering and design.

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JOSEPH CITY, ARIZONA

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EXHIBIT F – RECREATIONAL PURPOSES AND ASPECTS

Arizona Revised Statutes (ARS) §40-360 et seq. established the Power Plant and Transmission Line Siting Committee in 1971. ARS §40-360.06(A)(4) stipulates "the proposed availability of the site to the public for recreational purposes, consistent with safety considerations and regulations" are among the factors the Siting Committee must consider in reviewing CEC applications. As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

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

Currently, there are no existing, developed recreational resources withing the Project Study Area. In addition, there are no known plans to develop recreational facilities within the Project Study Area.

The 2003 Navajo County Character Areas Map has certain areas designated as Recreational; however, the closest area is over 25 miles southwest of the Project Study Area.

There are opportunities for people to recreate in the Project Study Area including cycling on the existing road network, dispersed hunting, and hiking. The public can also use the existing road network to travel to recreational areas outside of the Project Study Area. The Project will not prohibit or interfere with any of these activities.

In addition, there are two existing RV parks to the north in Joseph City, Norma's RV Park and McTribe RV Park. There are also several parks in the Towns of Winslow, approximately 18 miles west of Joseph City, and Holbrook, approximately 6 miles east of Joseph City.

Due to the distance from the Project to existing recreational uses, the Project is not expected to impact any existing or planned recreational opportunities.

EXHIBIT G – CONCEPTUAL DRAWINGS OF TYPICAL FACILITIES AND TRANSMISSION FACILITIES

Arizona Revised Statutes (ARS) §40-360 et seq. established the Power Plant and Transmission Line Siting Committee in 1971. ARS §40-360.06(A)(7) stipulates "the technical practicability of achieving a proposed objective and the previous experience with equipment and methods available for achieving a proposed objective" are among the factors the Siting Committee must consider in reviewing CEC applications. As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

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

The illustrations on the following pages represent conceptual design information for the Hashknife Energy Center.

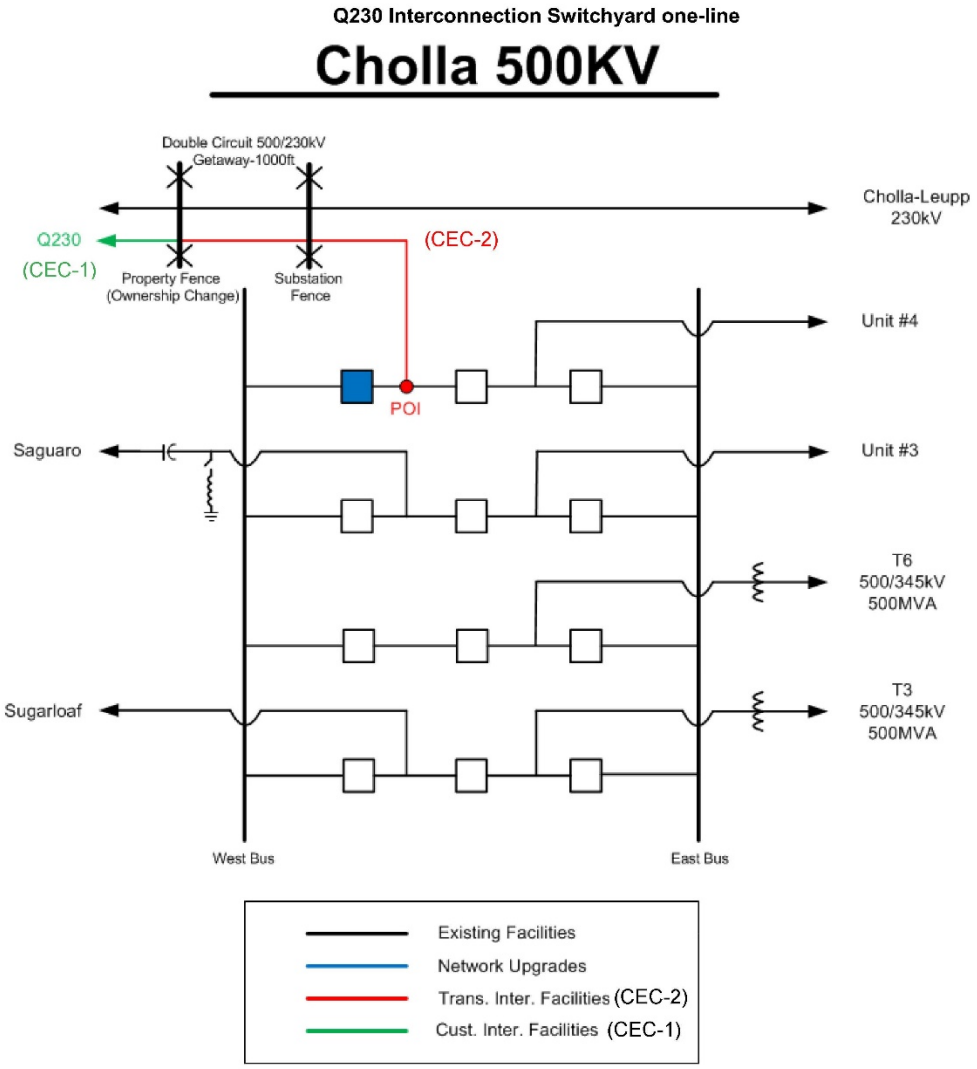


Figure G-1: Interconnection Switchyard One-Line Diagram

Figure G-1: Interconnection Switchyard One-Line Diagram

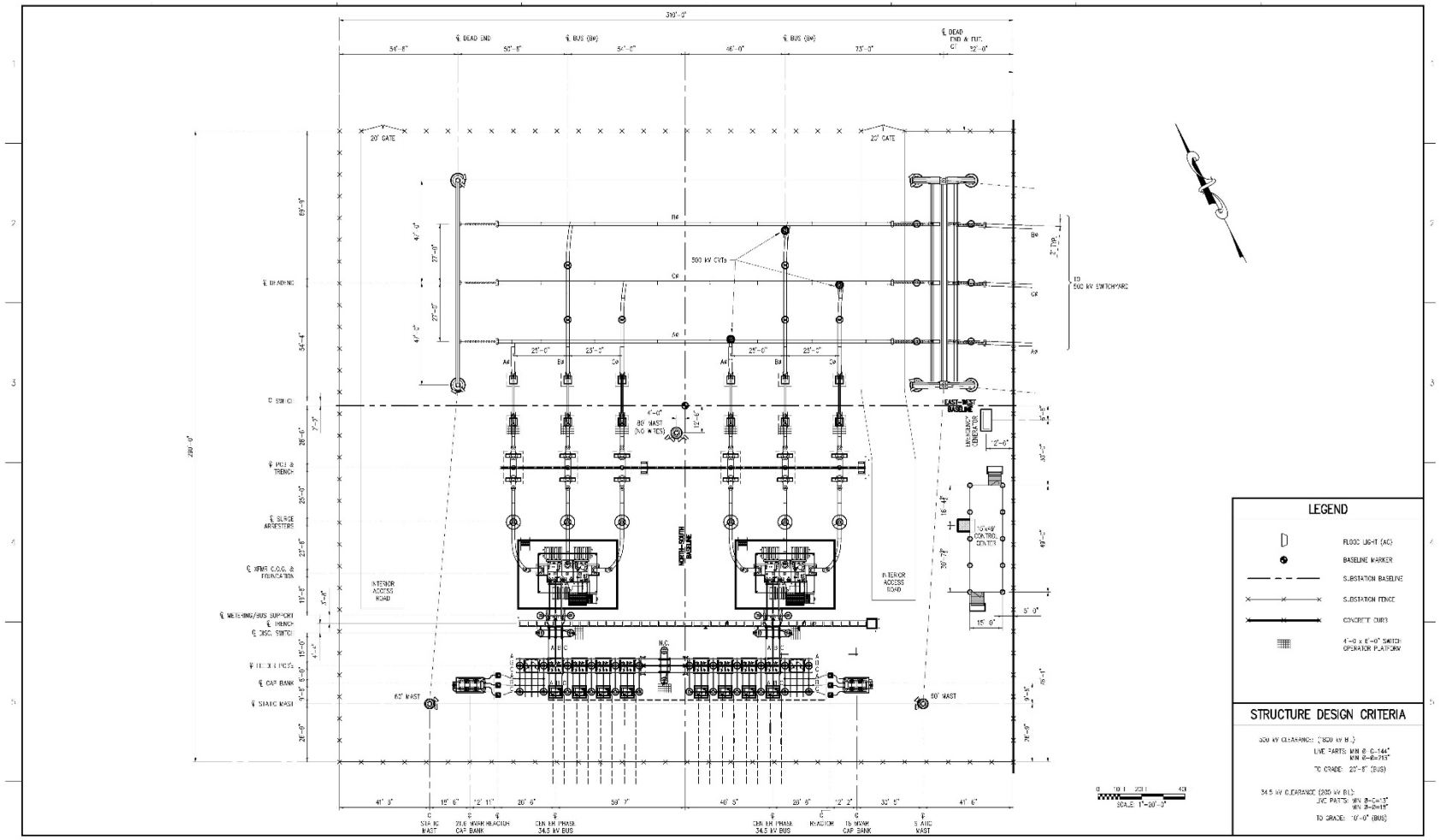


Figure G-2: Typical Single Circuit 50 kV Steel Lattice Structure

FIGURE G-3 TYPICAL SINGLE CIRCUIT 500kV STEEL LATTICE STRUCTURE

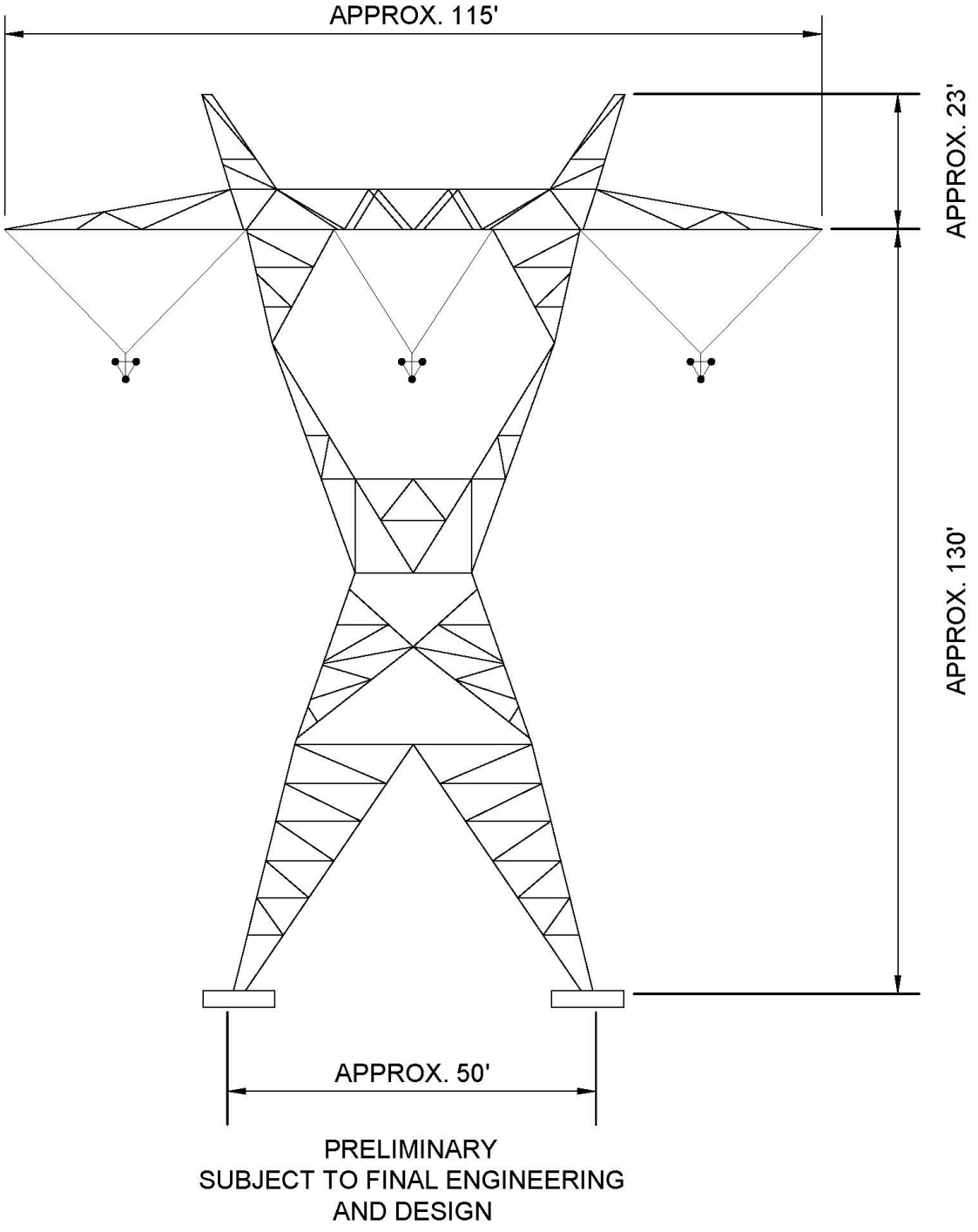


Figure G-3: Typical Single Circuit 500kV Steel Lattice Structure

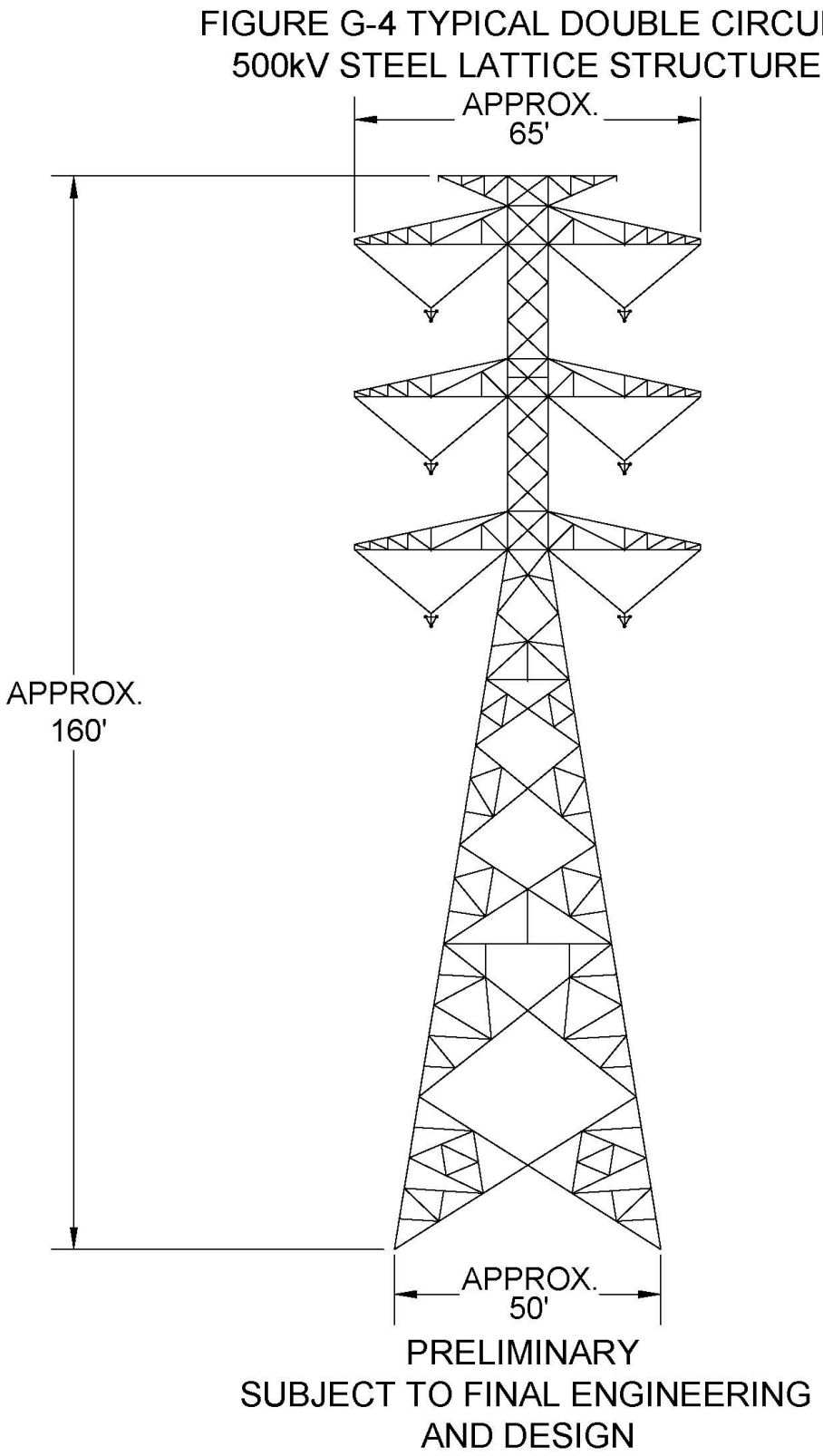


Figure G-4: Typical Double Circuit 500kV Steel Lattice Structure

FIGURE G-5 TYPICAL SINGLE CIRCUIT 500kV STEEL MONOPOLE

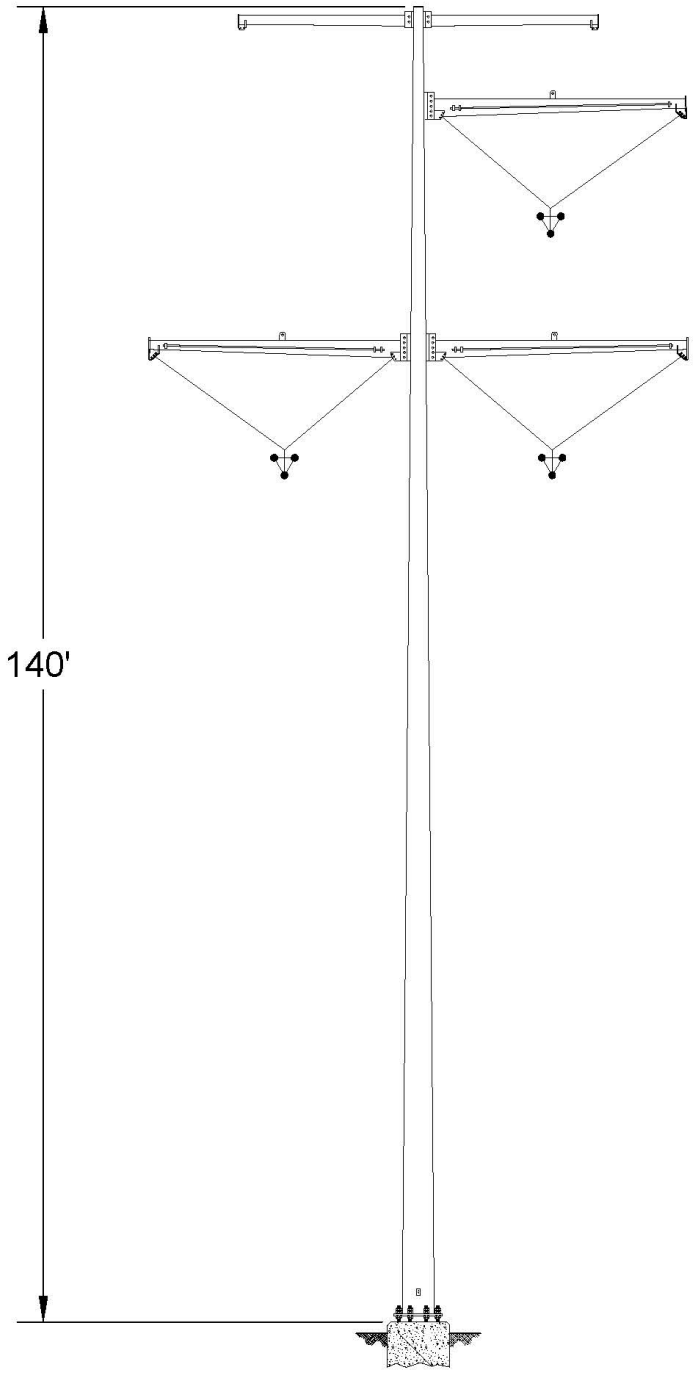


Figure G-5: Typical Single Circuit 500kV Steel Monopole Structure

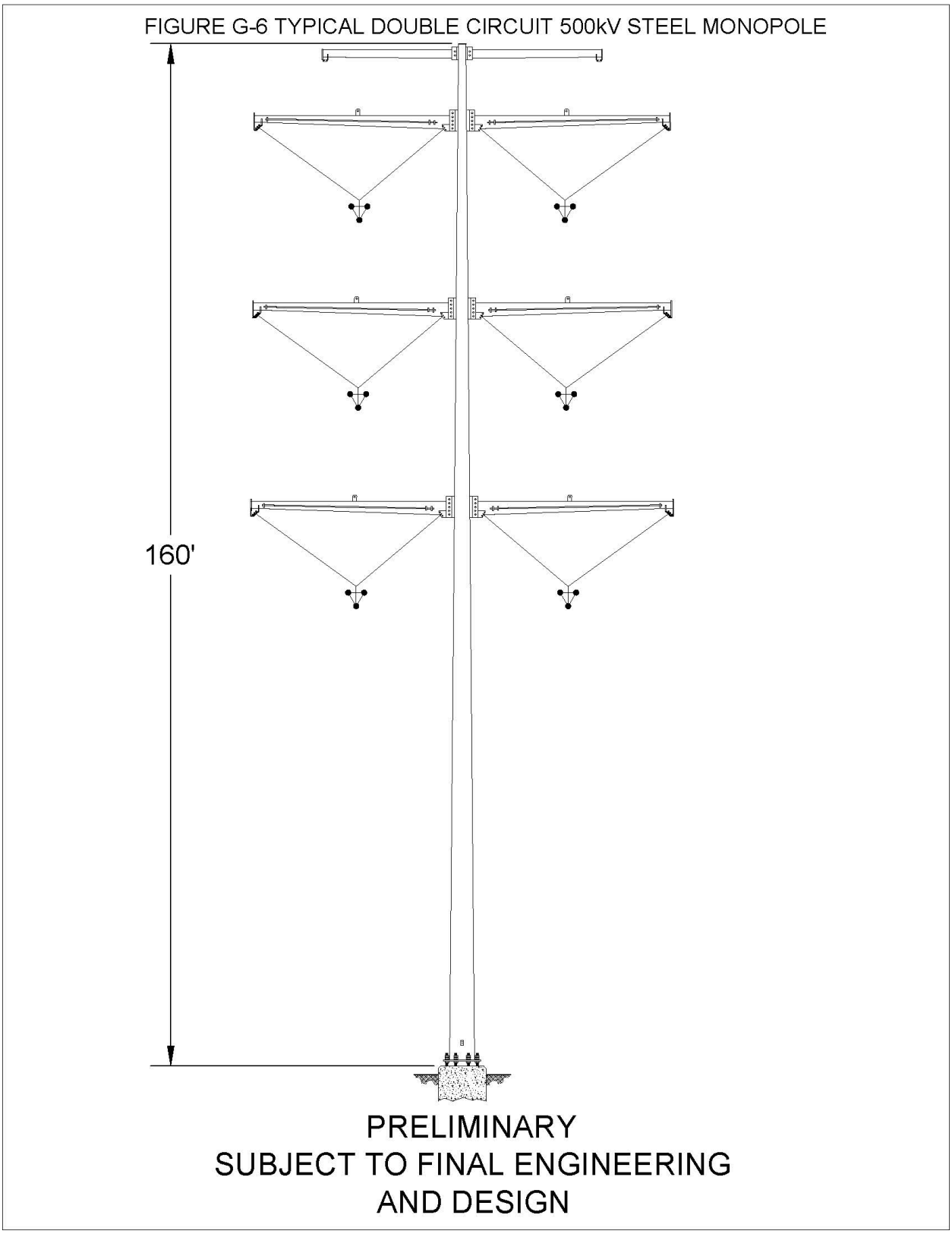
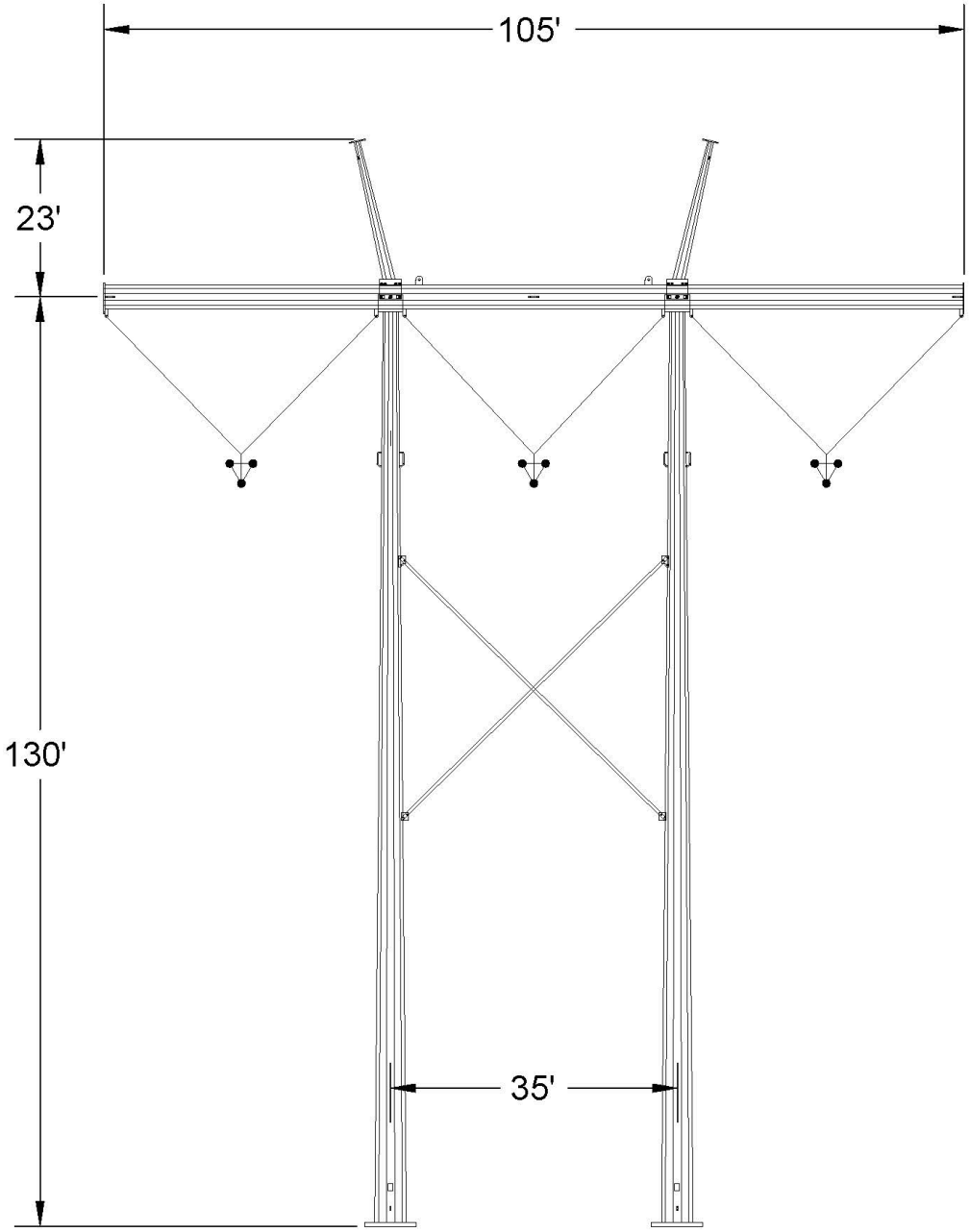


Figure G-6: Typical Double Circuit 500kV Steel Monopole Structure

FIGURE G-7 TYPICAL SINGLE CIRCUIT 500kV
STEEL H-FRAME STRUCTURE



PRELIMINARY
SUBJECT TO FINAL ENGINEERING
AND DESIGN

Figure G-7: Typical Single Circuit 500kV Steel H-Frame Structure

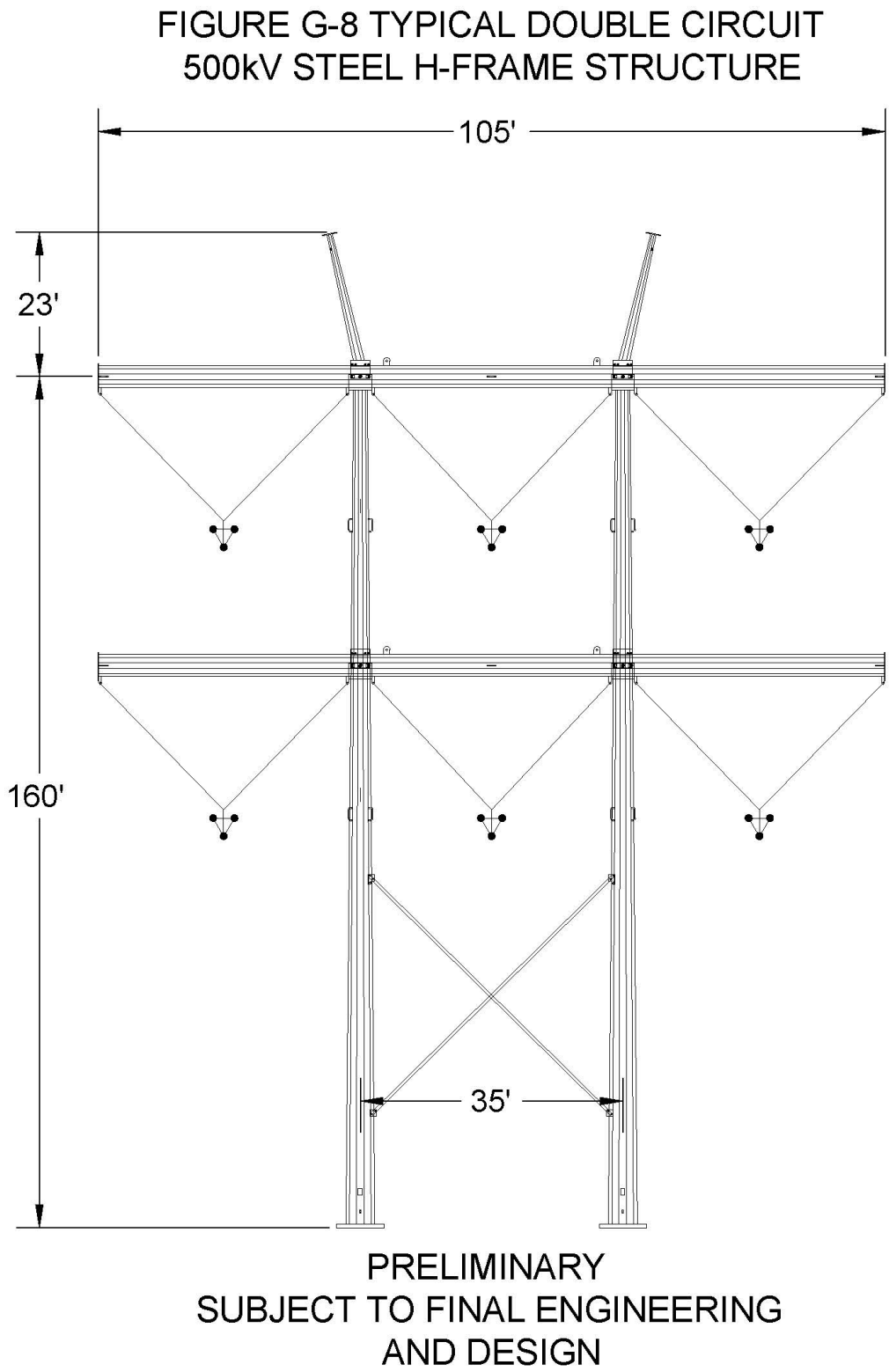


Figure G-8: Typical Double Circuit 500kV Steel H-Frame Structure

FIGURE G-9 TYPICAL SINGLE CIRCUIT 500kV STEEL 3-POLE STRUCTURE

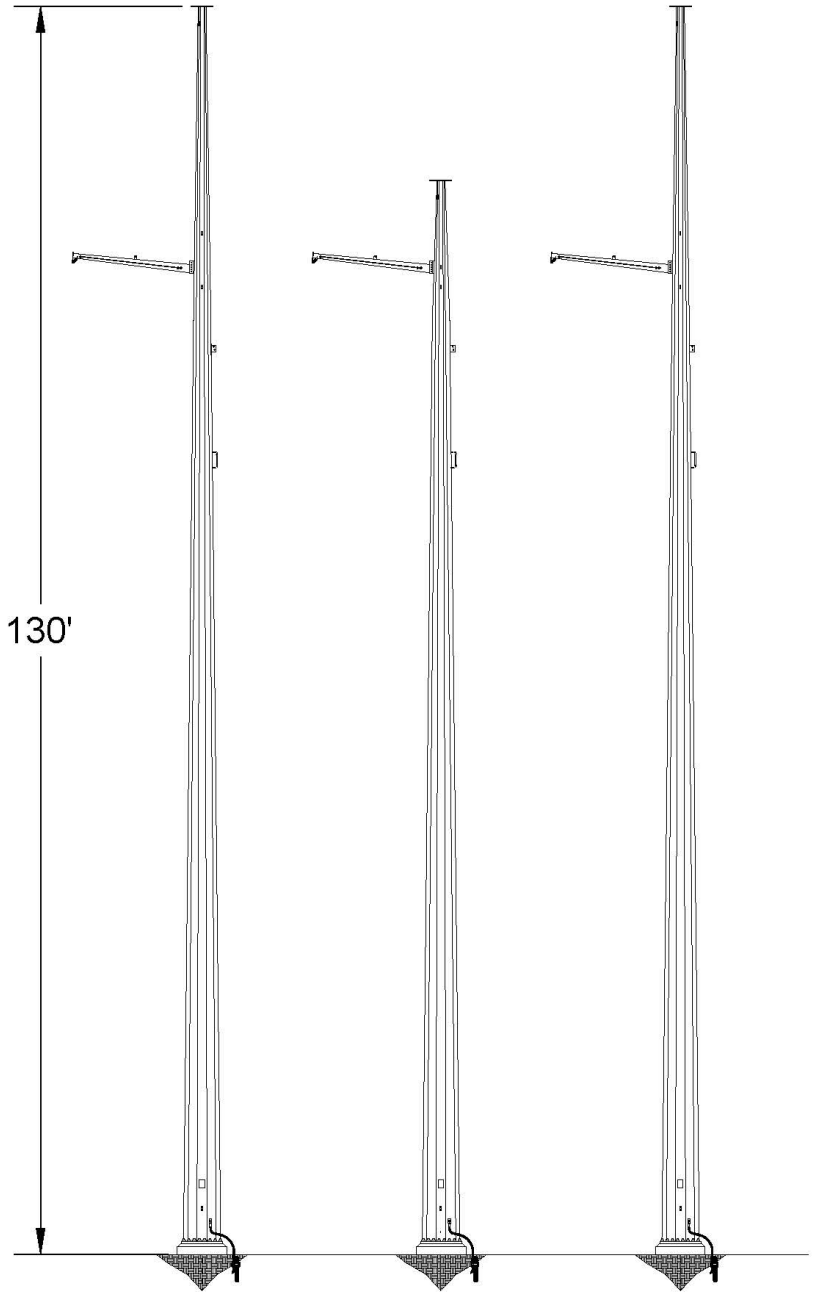


Figure G-9: Typical Single Circuit 500kV Steel 3 Pole Structure

FIGURE G-10 TYPICAL DOUBLE CIRCUIT 500kV STEEL 3-POLE STRUCTURE

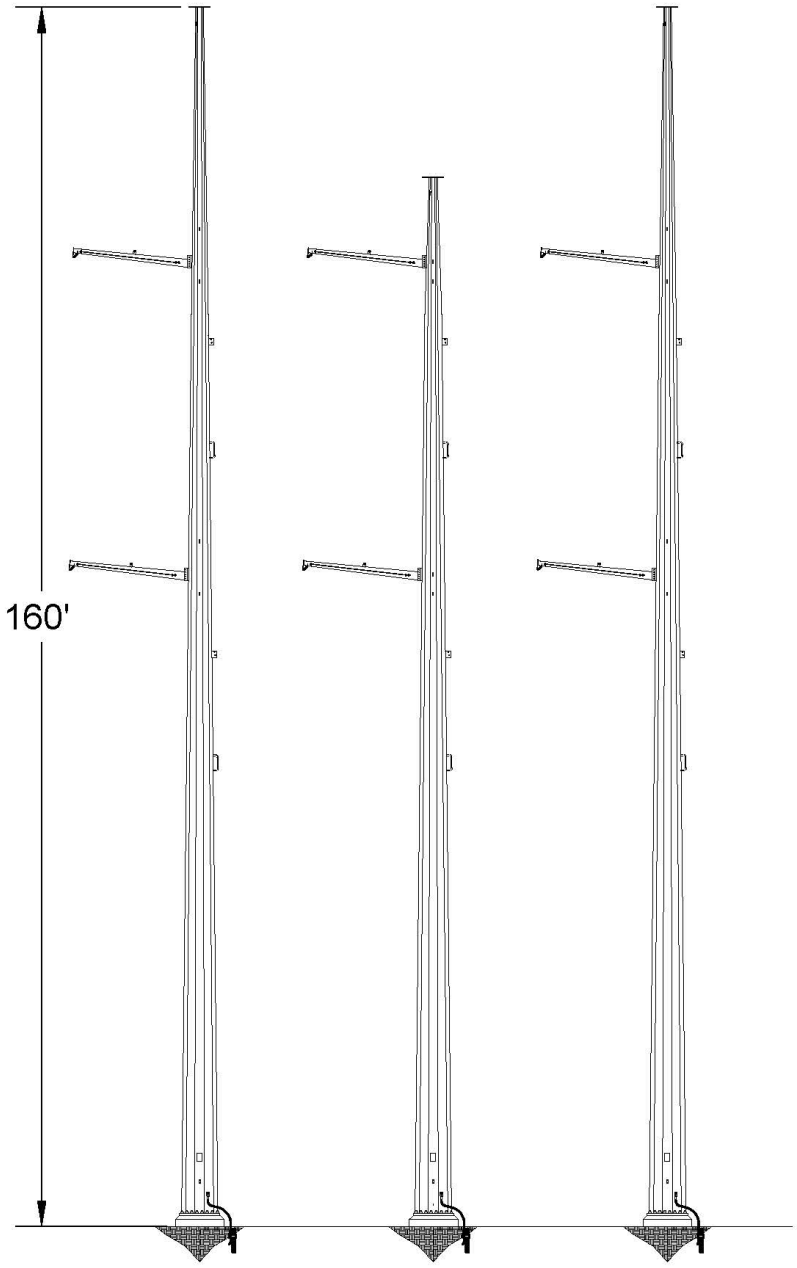


Figure G-10: Typical Double Circuit 500kV Steel 3 Pole Structure

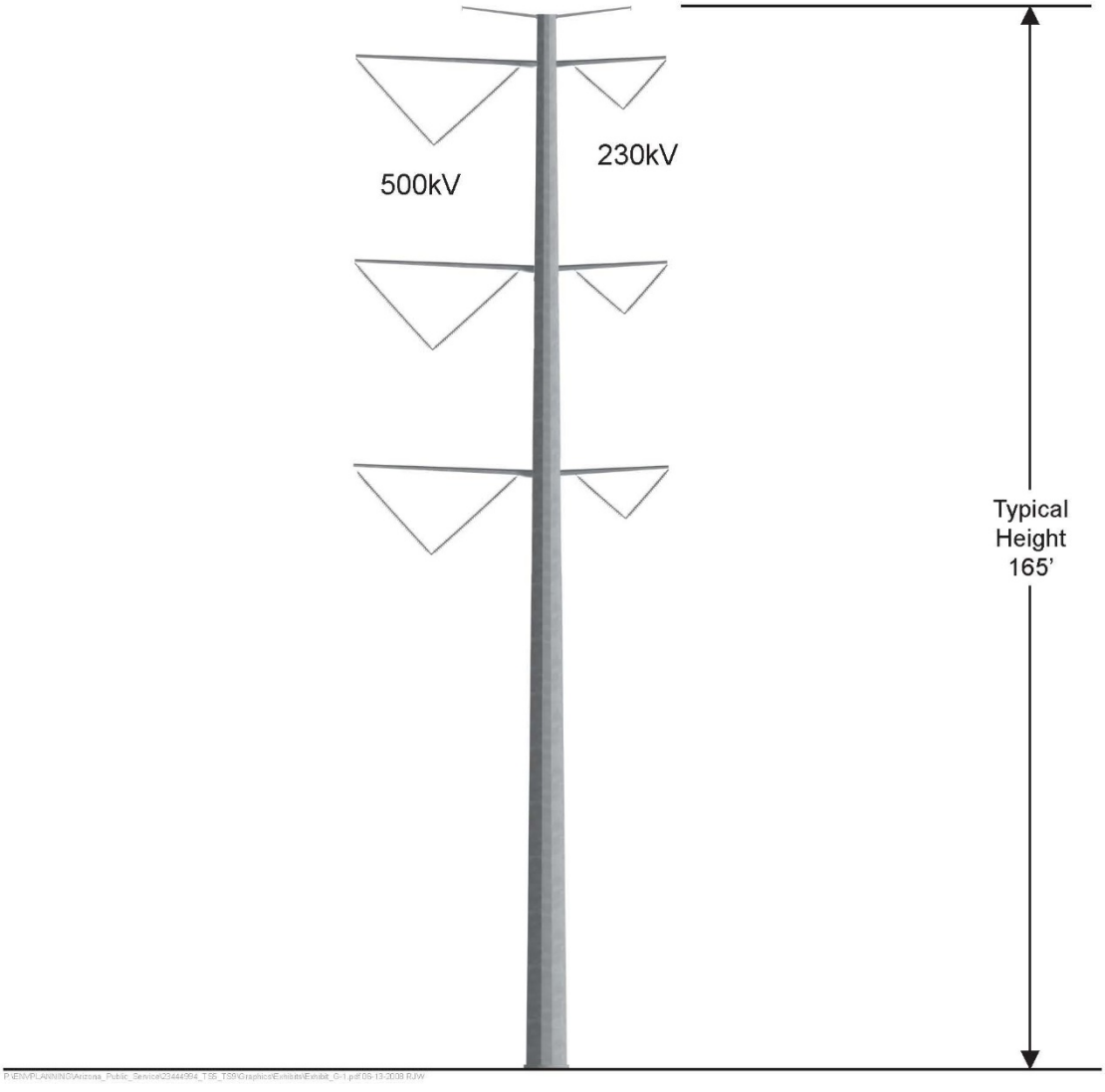


FIGURE G-11
Typical 500kV/230kV Tangent Pole (Galvanized)
Not to Scale

Figure G-11: Typical 500 230kV Tangent Pole

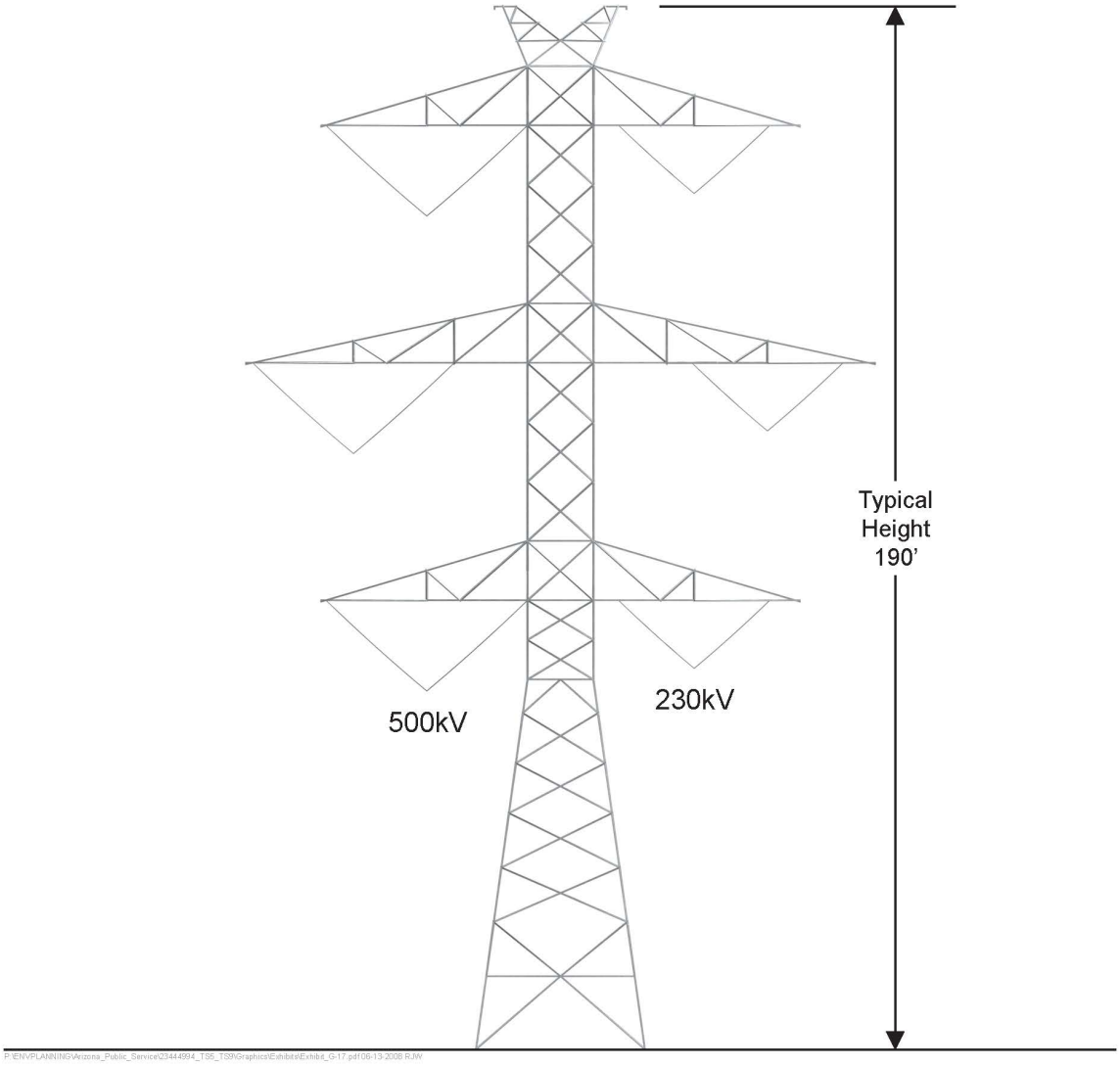


FIGURE G-12

Double Circuit 500kV/230kV Tangent Lattice Tower
Not to Scale

Figure G-12: Typical 500 230kV Lattice Tower

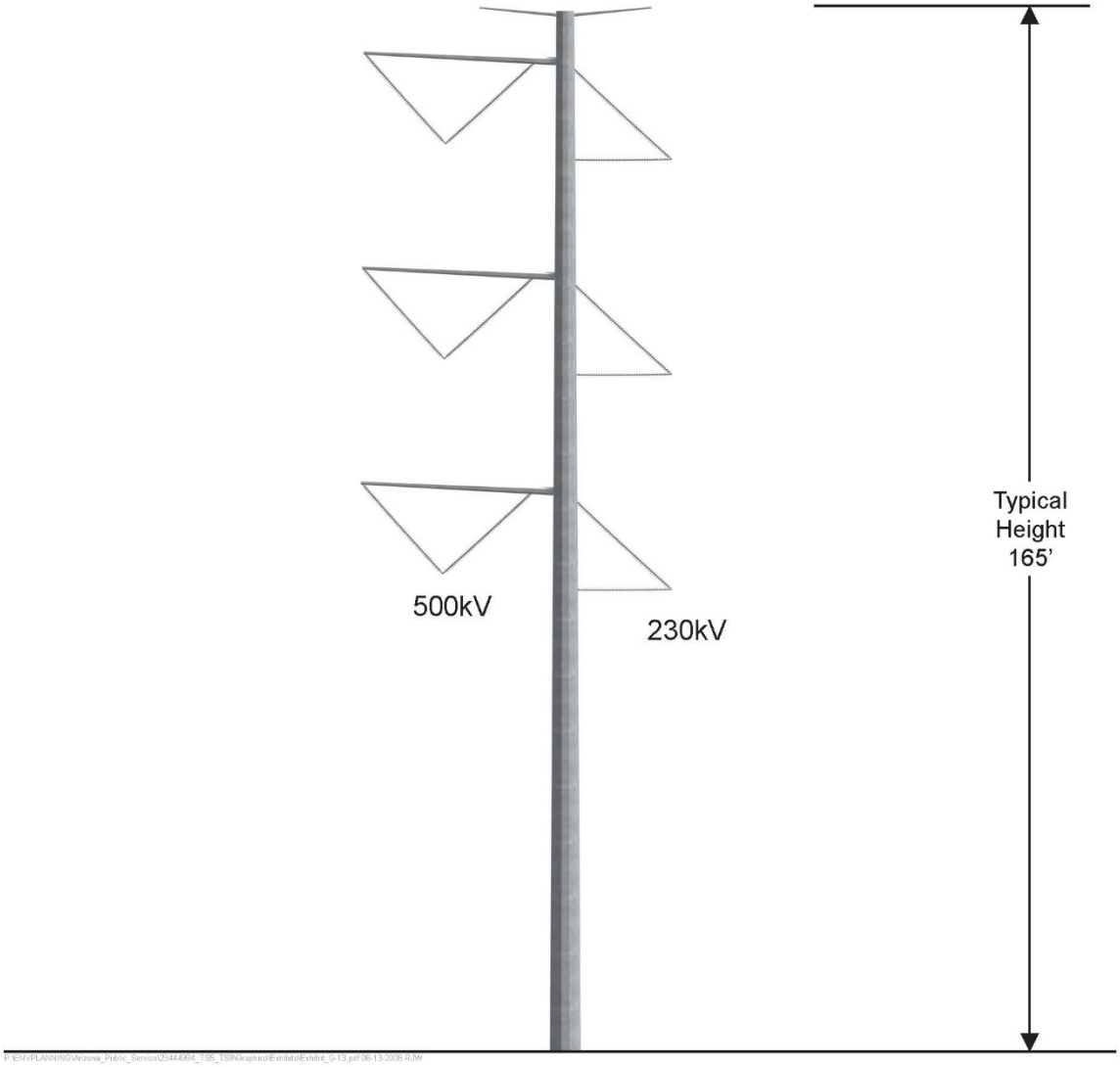


FIGURE G-13
500kV/230kV Tangent Pole with Braced Line Post on the 230kV (Galvanized)
Not to Scale

Figure G-13: Typical 500 230kV Tangent Pole with Line Post

EXHIBIT H – EXISTING PLANS

Arizona Revised Statutes (ARS) §40-360 et seq. established the Power Plant and Transmission Line Siting Committee in 1971. ARS §40-360.06(A)(1) stipulates "existing plans of the state, local government and private entities for other developments at or in the vicinity of the proposed site" are among the factors the Siting Committee must consider in reviewing CEC applications. As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

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

EXISTING PLANS OVERVIEW

Land uses are mapped in Exhibit A-2 and A-3, and are discussed in Exhibit A. As part of the land use study, any general and specific plans that were available were gathered for the Project Study Area from Navajo County. Representatives from Navajo County were also invited to participate in the open house meeting associated with the County's Special Use Permit process for the related solar facility site. The purpose of this representation was to ensure consistency with the plans and to identify potential issues throughout the environmental and public planning process.

During the planning process, members of the Project team also met with representatives from Navajo County, as well as private landowners within the Study Area on several occasions. There are three main landowners that make up the Solar Facility and Gen-Tie transmission lines including Aztec Land Company, APS, and ASLD. Invenergy engaged these landowners early in the planning process and will continue to do so throughout the life of the Project. Some key interactions are listed below in Table H-1. Discussions with these stakeholders offered the opportunity to provide Project information, discuss preferred and alternate transmission line routes, and request new or additional information on plans or planned developments. Stakeholder letters are available in Appendix H-1.

Table H- 1: Stakeholder Engagements

Event	Date
Preliminary Landowner Negotiations	April-May 2016
Navajo County Pre-Application Meeting for Special Use Permit	April 3, 2019
Public Open House for Navajo County Special Use Permit	May 15, 2019
Navajo County Planning & Zoning Hearing for Special Use Permit	October 17, 2019
Navajo County Board of Supervisors Hearing for Special Use Permit	November 12, 2019
Navajo County Planning & Zoning Hearing for Amended Special Use Permit	June 18, 2020
Navajo County Board of Supervisors Hearing for Amended Special Use Permit	June 23, 2020

Construction and operation of the proposed Gen-Tie Project would neither affect not be affected by other development plans in the vicinity. No changes in land ownership or jurisdiction would result from construction of the Gen-Tie Project. The presence of the proposed transmission line would not affect ranching or livestock grazing, the principal use for the majority of the land within the Study Area.

APPENDIX H-1 – STAKEHOLDER LETTERS

Invenergy

October 5, 2020

Mark Edelman, Planning Manager
Arizona State Land Department
1616 W. Adams Street
Phoenix, AZ 85007

Re: Hashknife Energy Center LLC, Navajo County, AZ, Re-Soliciting Questions or Comments
State Trust land located in T18N, R18E Section 36, Navajo County
ASLD Commercial Lease Application KE#03-120275-99-100

Dear Mr. Edelman:

Hashknife Energy Center, LLC is preparing to file an application with the Arizona Corporation Commission for a Certificate of Environmental Compatibility (CEC) in October 2020. The CEC addresses environmental impacts associated with the development of the Hashknife Energy Center (the Project), a planned photovoltaic solar and storage energy facility, in central Navajo County (State Trust land located in T18N, R18E Section 36, Navajo County ASLD Commercial Lease Application KE#03-120275-99-100). The Project is anticipated to produce approximately 400 megawatts of electricity, using ground-mounted photovoltaic solar panels. The Project is located on approximately 3,840 acres of state and privately-owned rangeland currently used for grazing livestock located south of Joseph City, immediately to the southwest of the Cholla Energy Plant. The Project would connect to the existing electrical grid via a 500-kilovolt transmission line that will follow either the preferred or alternative route assessed in the CEC (see attached map). The purpose of this letter is to solicit additional comments and information specifically pertaining to state, local, and private development projects that are planned in or near the proposed Project routes. This letter serves an opportunity to incorporate your comments regarding these development plans into the CEC application.

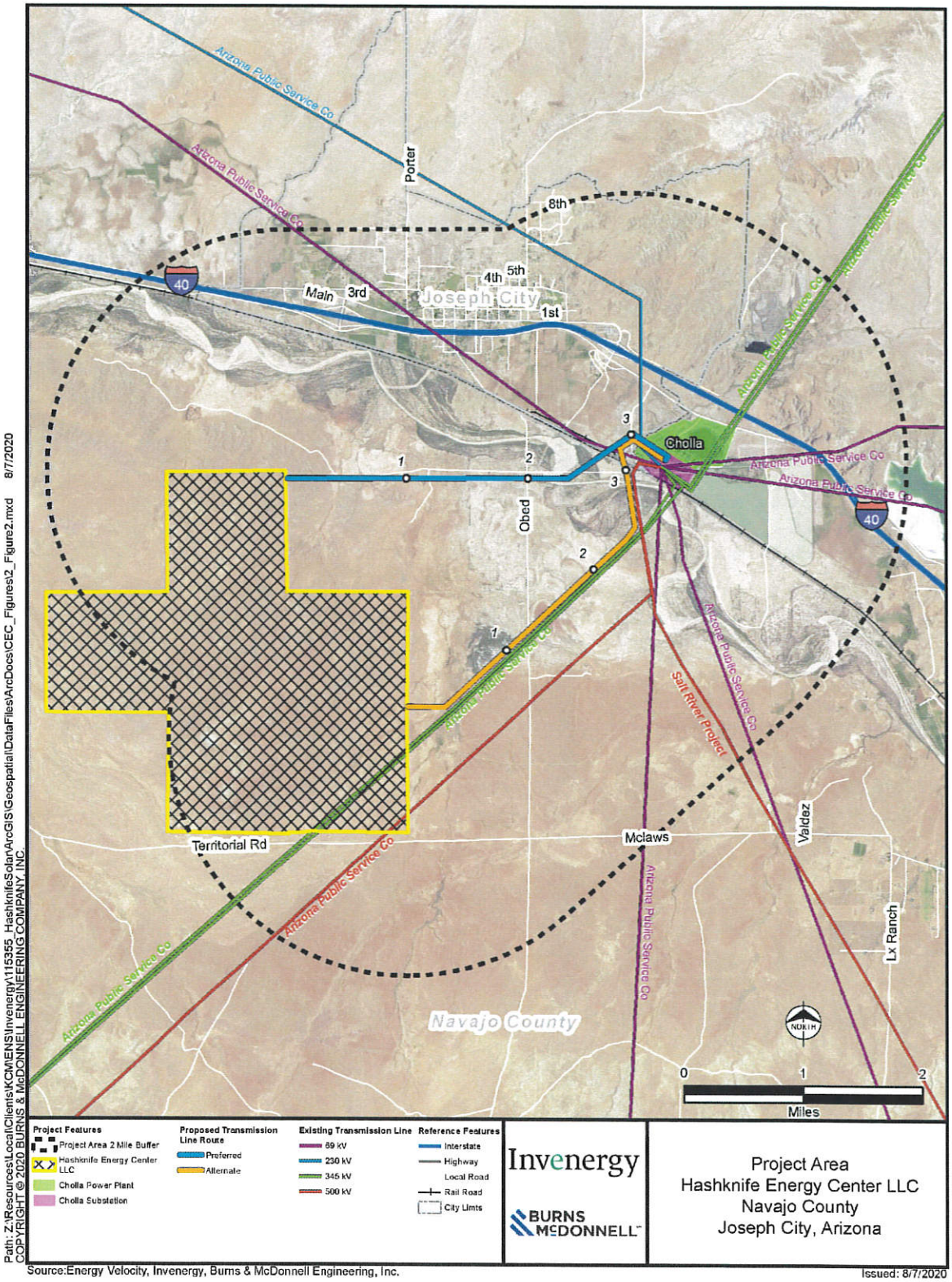
We respectfully request your verbal or written response (if any) describing planned projects in or near the proposed Project routes by November 6, 2020. For more information about the project and the upcoming hearing before the Arizona Power Plant and Transmission Line Siting Committee, please check out the following website: www.Hashknifesolar.com.

Invenergy

Please feel free to contact me at 303.557.4502 or *sinnis@invenergy.com* if you have any questions or comments.

Sincerely,

Susan Innis
Senior Manager, Renewable Development
Invenergy
303.557.4502
sinnis@invenergy.com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Source:Energy Velocity, Invenergy, Burns & McDonnell Engineering, Inc.
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Invenergy

October 5, 2020

Ray Moore, Commercial Leasing
Arizona State Land Department
1616 W. Adams Street
Phoenix, AZ 85007

Re: Hashknife Energy Center LLC, Navajo County, AZ, Re-Soliciting Questions or Comments
State Trust land located in T18N, R18E Section 36, Navajo County
ASLD Commercial Lease Application KE#03-120275-99-100

Dear Mr. Moore:

Hashknife Energy Center, LLC is preparing to file an application with the Arizona Corporation Commission for a Certificate of Environmental Compatibility (CEC) in October 2020 related to the transmission generation tie-line that will connect the solar and energy storage project to the existing electrical grid.

The CEC addresses environmental impacts associated with the development of the transmission line for the Hashknife Energy Center (the Project), a planned photovoltaic solar and storage energy facility, in central Navajo County. The Project is anticipated to produce approximately 400 megawatts of electricity, using ground-mounted photovoltaic solar panels. The Project is located on approximately 3,840 acres of state and privately-owned rangeland currently used for grazing livestock located south of Joseph City, immediately to the southwest of the Cholla Energy Plant. The Project would connect to the existing electrical grid via a 500-kilovolt transmission line that will follow either the preferred or alternative route assessed in the CEC (see attached map). The purpose of this letter is to solicit additional comments and information specifically pertaining to state, local, and private development projects that are planned in or near the proposed transmission line routes. This letter serves an opportunity to incorporate your comments regarding these development plans into the CEC application.

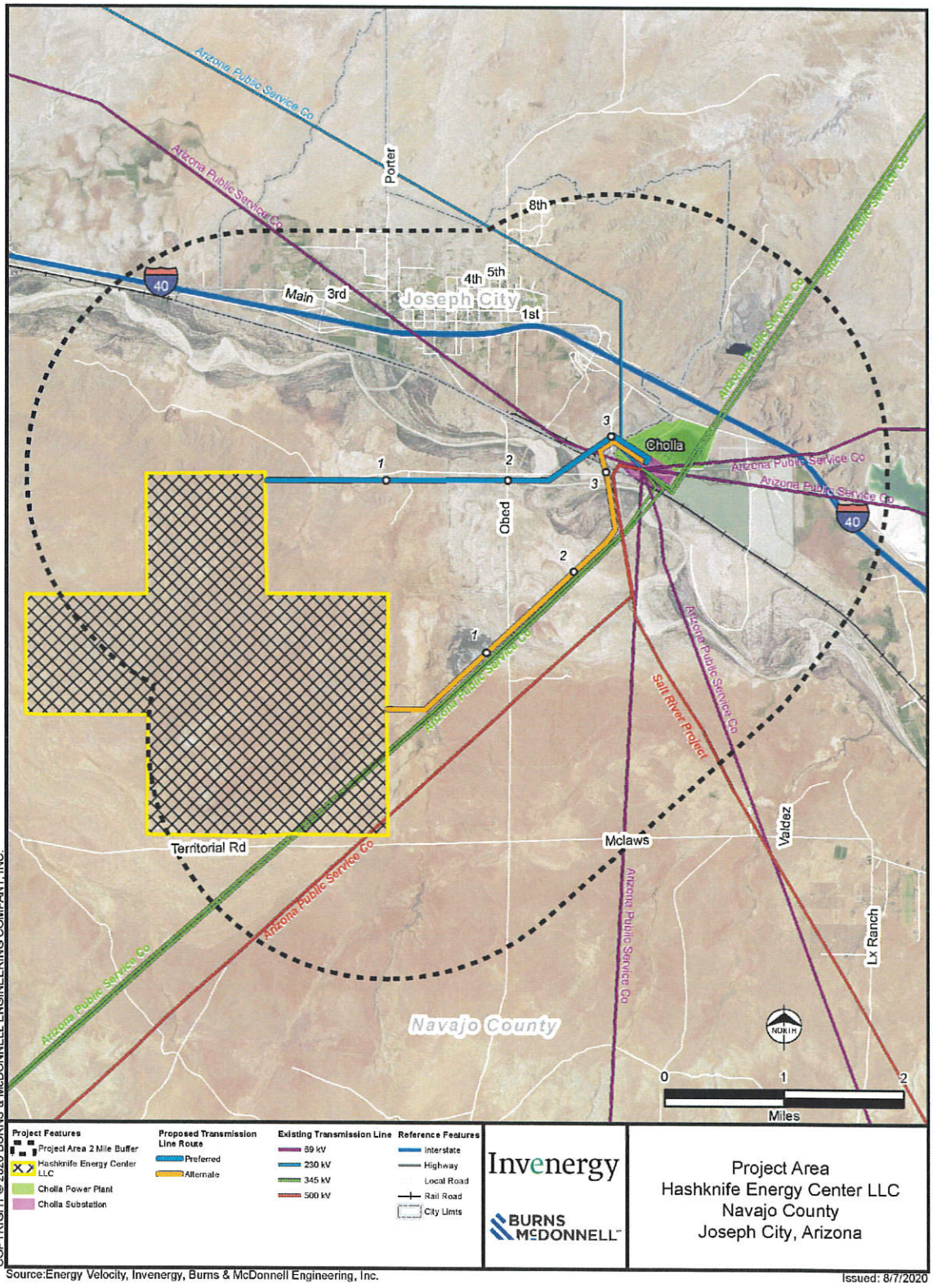
We respectfully request your verbal or written response (if any) describing planned projects in or near the proposed Project routes by November 6, 2020. For more information about the project and the upcoming hearing before the Arizona Power Plant and Transmission Line Siting Committee, please check out the following website: www.Hashknifesolar.com.

Invenergy

Please feel free to contact me at 303.557.4502 or *sinnis@invenergy.com* if you have any questions or comments.

Sincerely,

Susan Innis
Senior Manager, Renewable Development
Invenergy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Issued: 8/7/2020

Invenergy

October 5, 2020

Jason Whiting
100 East Code Talkers Drive
South Highway 77
P.O. Box 668
Holbrook, AZ 86025

Re: Hashknife Energy Center LLC, Navajo County, AZ, Re-Soliciting Questions or Comments

Dear Supervisor Whiting:

Hashknife Energy Center, LLC is preparing to file an application with the Arizona Corporation Commission for a Certificate of Environmental Compatibility (CEC) in October 2020 related to the transmission generation tie-line that will connect the solar and energy storage project to the existing electrical grid.

The CEC addresses environmental impacts associated with the development of the Hashknife Energy Center (the Project), a planned photovoltaic solar and storage energy facility, in central Navajo County. The Project is anticipated to produce approximately 400 megawatts of electricity, using ground-mounted photovoltaic solar panels. The Project is located on approximately 3,840 acres of state and privately-owned rangeland currently used for grazing livestock located south of Joseph City, immediately to the southwest of the Cholla Energy Plant. The Project would connect to the existing electrical grid via a 500-kilovolt transmission line that will follow either the preferred or alternative route assessed in the CEC (see attached map). The purpose of this letter is to solicit additional comments and information specifically pertaining to state, local, and private development projects that are planned in or near the proposed transmission line routes. This letter serves an opportunity to incorporate your comments regarding these development plans into the CEC application.

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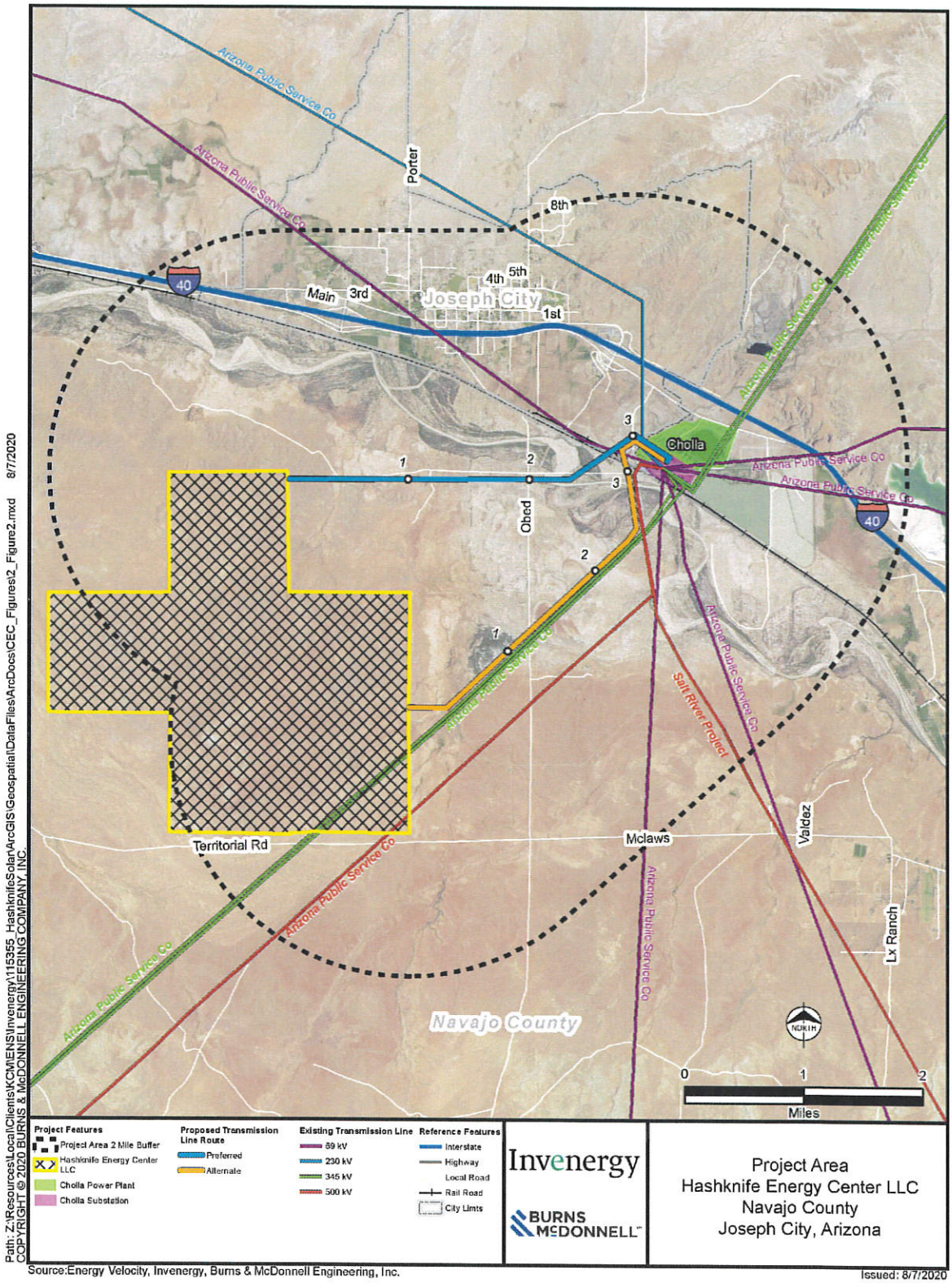
Invenergy

Please feel free to contact me at 303.557.4502 or *sinnis@invenergy.com* if you have any questions or comments.

Sincerely,

Susan Innis
Senior Manager, Renewable Development
Invenergy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October 5, 2020

Berrin Nejad, Community Development Director
100 West Public Works Drive
PO Box 668
Holbrook AZ 86025

Re: Hashknife Energy Center LLC, Navajo County, AZ, Re-Soliciting Questions or Comments

Dear Ms. Nejad:

Hashknife Energy Center, LLC is preparing to file an application with the Arizona Corporation Commission for a Certificate of Environmental Compatibility (CEC) in October 2020 related to the transmission generation tie-line that will connect the solar and energy storage project to the existing electrical grid.

The CEC addresses environmental impacts associated with the development of the Hashknife Energy Center (the Project), a planned photovoltaic solar and storage energy facility, in central Navajo County. The Project is anticipated to produce approximately 400 megawatts of electricity, using ground-mounted photovoltaic solar panels. The Project is located on approximately 3,840 acres of state and privately-owned rangeland currently used for grazing livestock located south of Joseph City, immediately to the southwest of the Cholla Energy Plant. The Project would connect to the existing electrical grid via a 500-kilovolt transmission line that will follow either the preferred or alternative route assessed in the CEC (see attached map). The purpose of this letter is to solicit additional comments and information specifically pertaining to state, local, and private development projects that are planned in or near the proposed transmission line routes. This letter serves an opportunity to incorporate your comments regarding these development plans into the CEC application.

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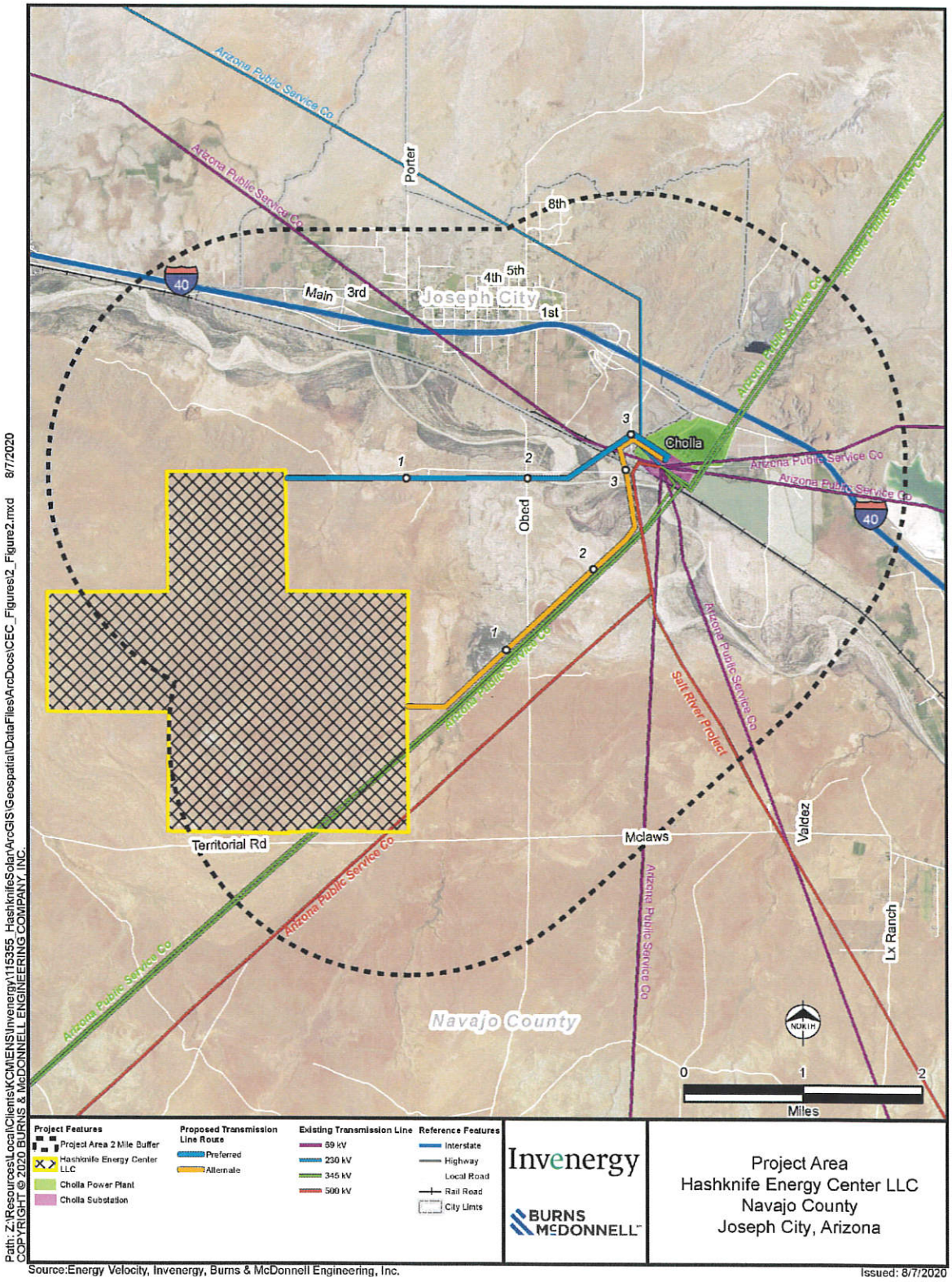
Invenergy

Please feel free to contact me at 303.557.4502 or *sinnis@invenergy.com* if you have any questions or comments.

Sincerely,

Susan Innis
Senior Manager, Renewable Development
Invenergy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Invenergy

October 5, 2020

Cody Cooper, Planner
Navajo County
100 West Public Works Drive
PO Box 668
Holbrook AZ 86025

Re: Hashknife Energy Center LLC, Navajo County, AZ, Re-Soliciting Questions or Comments

Dear Mr. Cooper,

Hashknife Energy Center, LLC is preparing to file an application with the Arizona Corporation Commission for a Certificate of Environmental Compatibility (CEC) in October 2020 related to the transmission generation tie-line that will connect the solar and energy storage project to the existing electrical grid.

The CEC addresses environmental impacts associated with the development of the Hashknife Energy Center (the Project), a planned photovoltaic solar and storage energy facility, in central Navajo County. The Project is anticipated to produce approximately 400 megawatts of electricity, using ground-mounted photovoltaic solar panels. The Project is located on approximately 3,840 acres of state and privately-owned rangeland currently used for grazing livestock located south of Joseph City, immediately to the southwest of the Cholla Energy Plant. The Project would connect to the existing electrical grid via a 500-kilovolt transmission line that will follow either the preferred or alternative route assessed in the CEC (see attached map). The purpose of this letter is to solicit additional comments and information specifically pertaining to state, local, and private development projects that are planned in or near the proposed transmission line routes. This letter serves an opportunity to incorporate your comments regarding these development plans into the CEC application.

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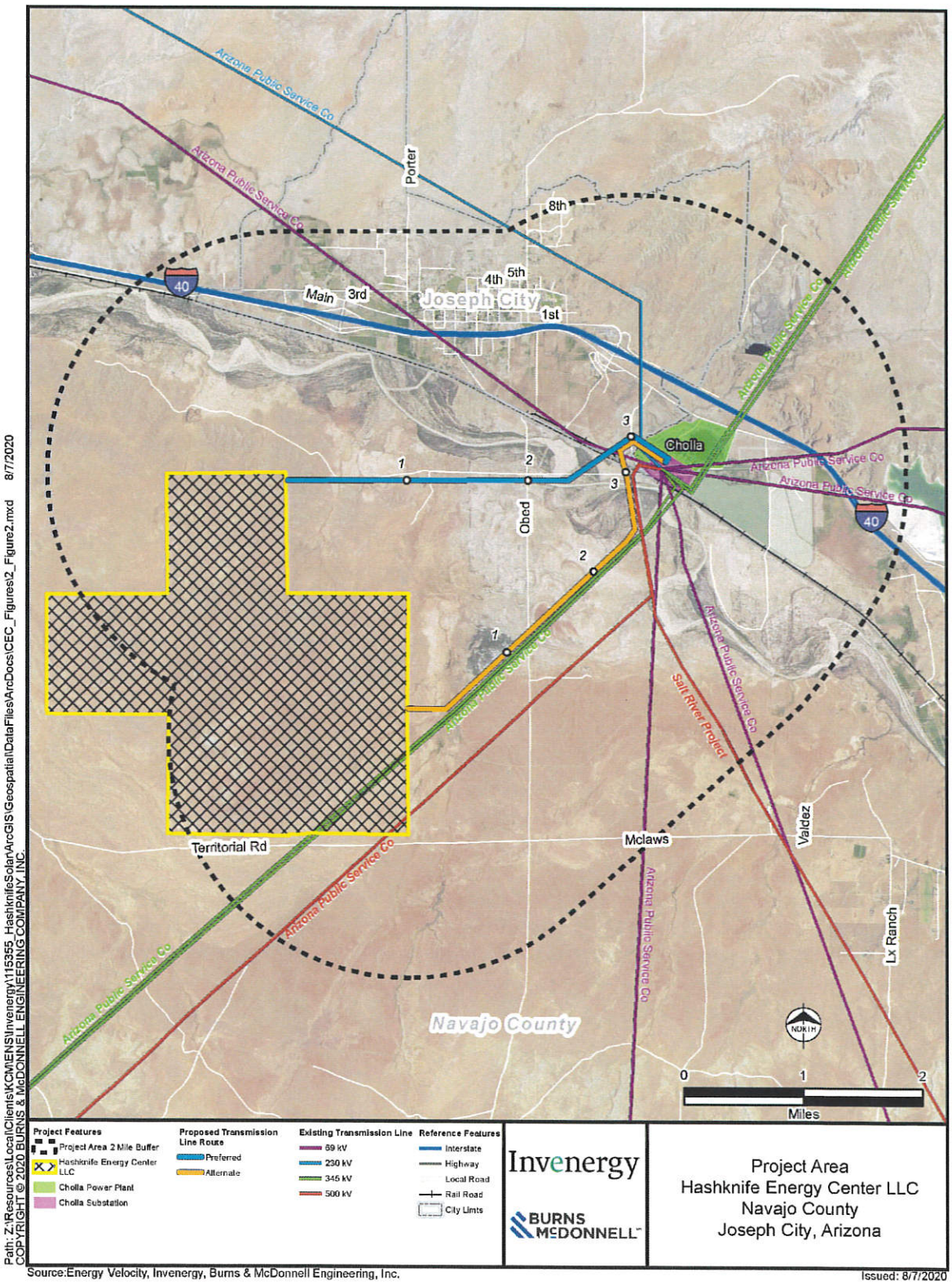
Senior Manager, Renewable Development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October 5, 2020

John Osgood, Public Works Director
Navajo County Public Works
100 W. Public Works Drive
South Highway 77
P.O. Box 668
Holbrook, AZ 86025

Re: Hashknife Energy Center LLC, Navajo County, AZ, Re-Soliciting Questions or Comments

Dear Mr. Osgood:

Hashknife Energy Center, LLC is preparing to file an application with the Arizona Corporation Commission for a Certificate of Environmental Compatibility (CEC) in October 2020 related to the transmission generation tie-line that will connect the solar and energy storage project to the existing electrical grid.

The CEC addresses environmental impacts associated with the development of the Hashknife Energy Center (the Project), a planned photovoltaic solar and storage energy facility, in central Navajo County. The Project is anticipated to produce approximately 400 megawatts of electricity, using ground-mounted photovoltaic solar panels. The Project is located on approximately 3,840 acres of state and privately-owned rangeland currently used for grazing livestock located south of Joseph City, immediately to the southwest of the Cholla Energy Plant. The Project would connect to the existing electrical grid via a 500-kilovolt transmission line that will follow either the preferred or alternative route assessed in the CEC (see attached map). The purpose of this letter is to solicit additional comments and information specifically pertaining to state, local, and private development projects that are planned in or near the proposed transmission line routes. This letter serves an opportunity to incorporate your comments regarding these development plans into the CEC application.

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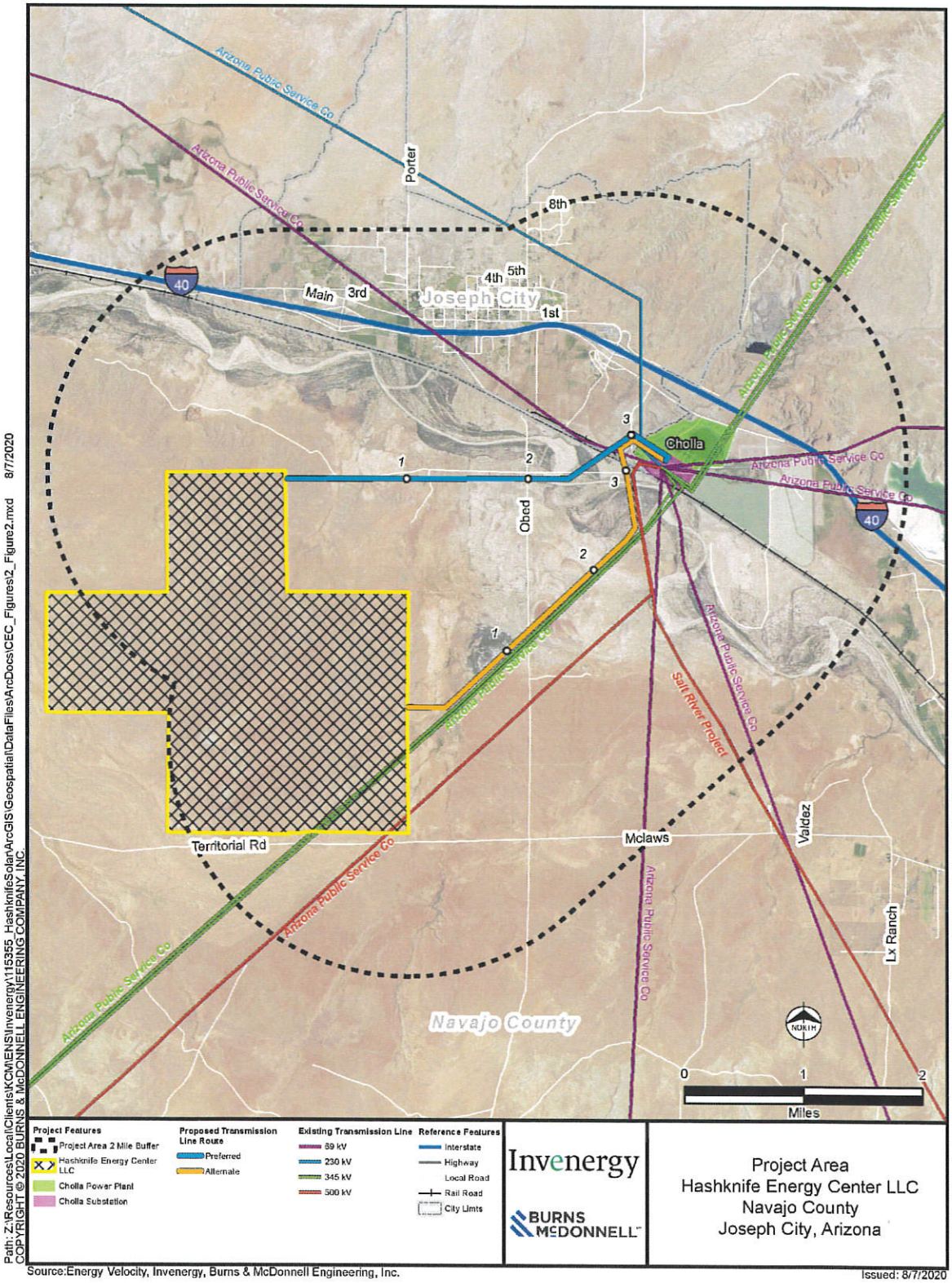
Invenergy

Please feel free to contact me at 303.557.4502 or *sinnis@invenergy.com* if you have any questions or comments.

Sincerely,

Susan Innis
Senior Manager, Renewable Development
Invenergy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Hashknife Energy Center LLC
Cholla Power Plant
Cholla Substation
Proposed Transmission Line Route
Preferred
Alternate
Existing Transmission Line
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230 kV
345 kV
500 kV
Reference Features
Interstate
Highway
Local Road
Rail Road
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Issued: 8/7/2020

Invenergy

October 5, 2020

Sandra Phillips, Asst County Engineer/Flood Control Mgr
100 West Public Works Drive
PO Box 668
Holbrook AZ 86025

Re: Hashknife Energy Center LLC, Navajo County, AZ, Re-Soliciting Questions or Comments

Dear Ms. Phillips,

Hashknife Energy Center, LLC is preparing to file an application with the Arizona Corporation Commission for a Certificate of Environmental Compatibility (CEC) in October 2020 related to the transmission generation tie-line that will connect the solar and energy storage project to the existing electrical grid.

The CEC addresses environmental impacts associated with the development of the Hashknife Energy Center (the Project), a planned photovoltaic solar and storage energy facility, in central Navajo County. The Project is anticipated to produce approximately 400 megawatts of electricity, using ground-mounted photovoltaic solar panels. The Project is located on approximately 3,840 acres of state and privately-owned rangeland currently used for grazing livestock located south of Joseph City, immediately to the southwest of the Cholla Energy Plant. The Project would connect to the existing electrical grid via a 500-kilovolt transmission line that will follow either the preferred or alternative route assessed in the CEC (see attached map). The purpose of this letter is to solicit additional comments and information specifically pertaining to state, local, and private development projects that are planned in or near the proposed transmission line routes. This letter serves an opportunity to incorporate your comments regarding these development plans into the CEC application.

We respectfully request your verbal or written response (if any) describing planned projects in or near the proposed Project routes by November 6, 2020. For more information about the project and the upcoming hearing before the Arizona Power Plant and Transmission Line Siting Committee, please check out the following website: www.Hashknifesolar.com.

Invenergy

Please feel free to contact me at 303.557.4502 or *sinnis@invenergy.com* if you have any questions or comments.

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Susan Innis
Senior Manager, Renewable Development
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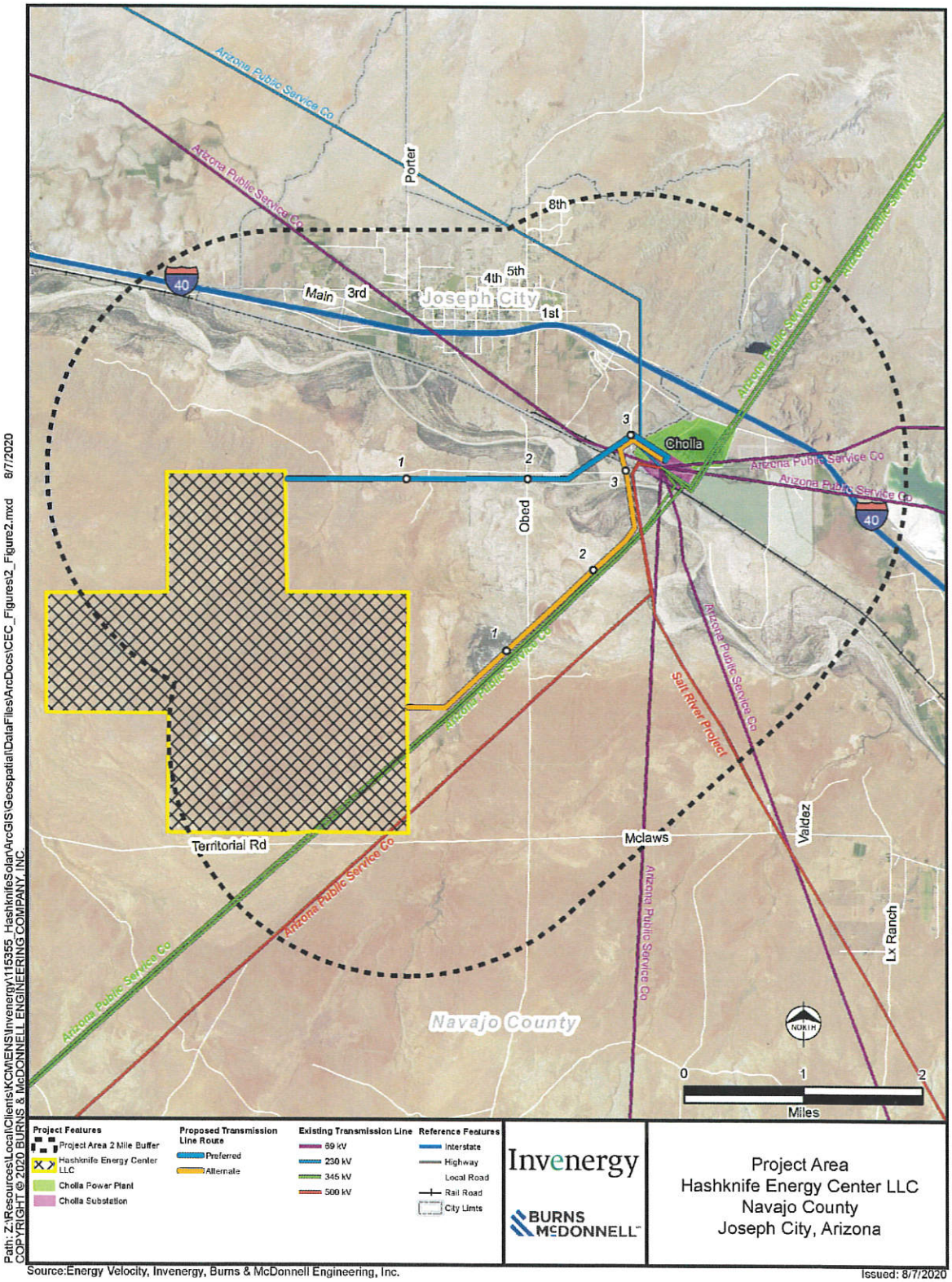
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Source:Energy Velocity, Invenergy, Burns & McDonnell Engineering, Inc.
Issued: 8/7/2020

Invenergy

October 5, 2020

Mark Norton
General Director – R.O.W & Real Estate Management
BNSF Railway
2301 Lou Menk Drive
GOB-3W
Fort Worth, TX 76131-2830

Re: Hashknife Energy Center LLC, Navajo County, AZ, Re-Soliciting Questions or Comments

Dear Mr. Norton:

Hashknife Energy Center, LLC is preparing to file an application with the Arizona Corporation Commission for a Certificate of Environmental Compatibility (CEC) in October 2020 related to the transmission generation tie-line that will connect the solar and energy storage project to the existing electrical grid.

The CEC addresses environmental impacts associated with the development of the Hashknife Energy Center (the Project), a planned photovoltaic solar and storage energy facility, in central Navajo County. The Project is anticipated to produce approximately 400 megawatts of electricity, using ground-mounted photovoltaic solar panels. The Project is located on approximately 3,840 acres of state and privately-owned rangeland currently used for grazing livestock located south of Joseph City, immediately to the southwest of the Cholla Energy Plant. The Project would connect to the existing electrical grid via a 500-kilovolt transmission line that will follow either the preferred or alternative route assessed in the CEC (see attached map). The purpose of this letter is to solicit additional comments and information specifically pertaining to state, local, and private development projects that are planned in or near the proposed transmission line routes. This letter serves an opportunity to incorporate your comments regarding these development plans into the CEC application.

We respectfully request your verbal or written response (if any) describing planned projects in or near the proposed Project routes by November 6, 2020. For more information about the project and the upcoming hearing before the Arizona Power Plant and Transmission Line Siting Committee, please check out the following website: www.Hashknifesolar.com.

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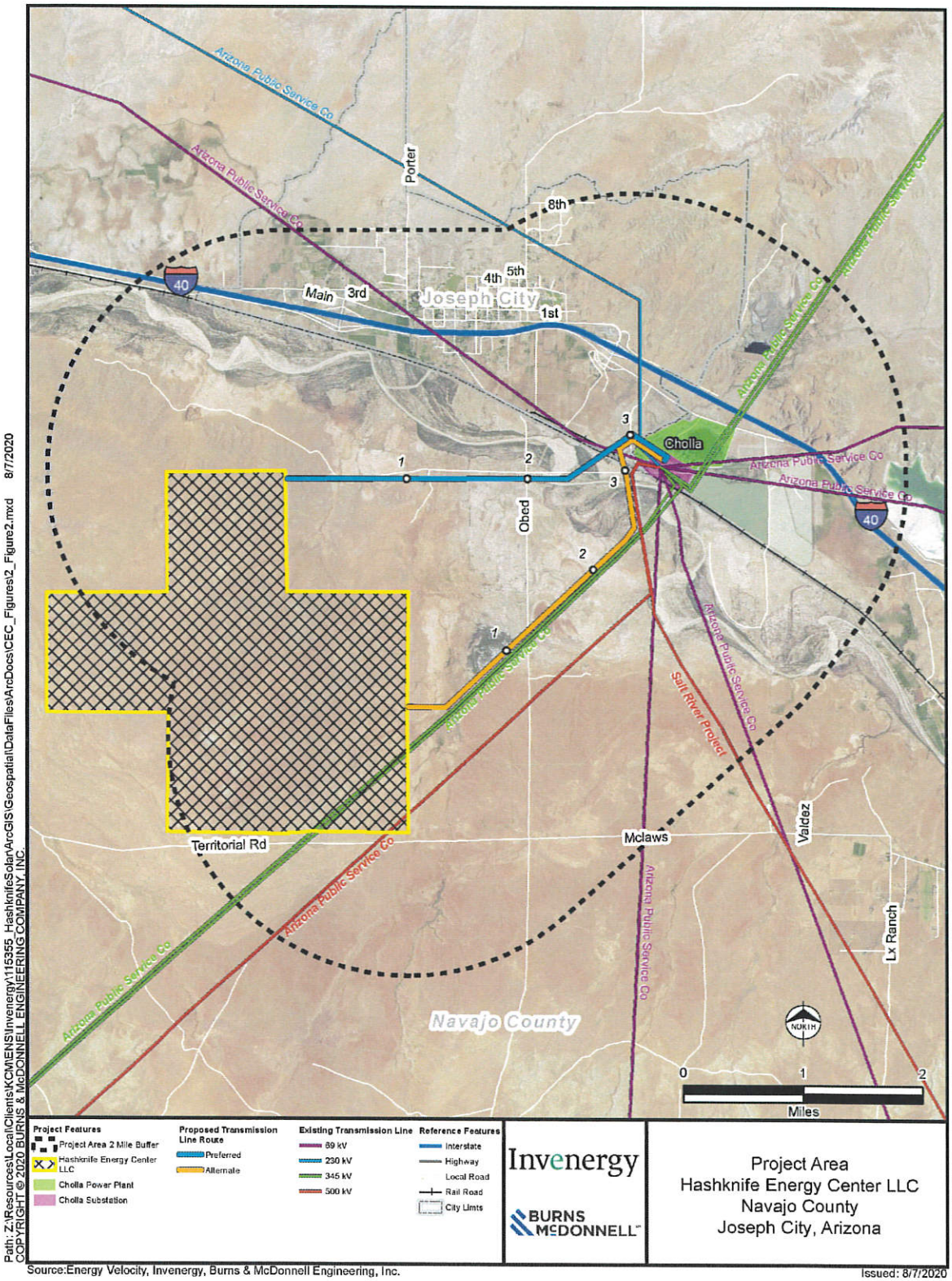
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Issued: 8/7/2020

EXHIBIT I – ANTICIPATED NOISE/INTERFERENCE WITH COMMUNICATION SIGNALS

Arizona Revised Statutes (ARS) §40-360 et seq. established the Power Plant and Transmission Line Siting Committee in 1971. ARS §40-360.06(A)(3) stipulates "noise emission levels and interference with communication signals" are among the factors the Siting Committee must consider in reviewing Certificate of Environmental Compatibility (CEC) applications. As stated in Arizona Administrative Code R14-3-219:

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

The following analysis describes typical audible noise emissions and radio noise levels during construction and operation of the Gen-tie Project, and generally acceptable thresholds for emissions and radio levels. Typical television broadcast level (in megahertz [MHZ]) compatibility is also evaluated.

EXISTING SOUND LEVELS

Ambient noise in the Study Area is typical of rural areas where grazing activities are the most common use. The Study Area is comprised primarily of privately owned land as well as a few parcels owned by the State of Arizona and BLM. The Study Area includes industrial, utilities, agricultural, rangeland, residential, commercial, recreation, transportation, education, and vacant land uses. Overall, the Study Area is a semi-developed rural area primarily used for grazing with existing utility infrastructure, scattered agricultural uses and residential uses centered in and around Joseph City. Industrial and utility development is clustered around the Cholla Power Plant.

Typical sound levels in rural areas range from 30 to 50 dB (daytime averages) (Arizona Department of Transportation 2008). Noise-producing activities in the Study Area include traffic along Interstate 40 and noise emissions from the existing Cholla Power Plant and its numerous transmission lines that come in and out of the facilities.

Table I-1 contains definitions of acoustic terms used in this report, and Table I-2 provides example sound levels that a human may encounter.

Table I-1: Definitions of Acoustical Terms

Term	Definitions
Sound	Describes wave-like variations in air pressure that occur at frequencies that can stimulate receptors in the inner ear and, if sufficiently powerful, be appreciated at a conscious level.
Noise	Implies the presence of sound but also implies a response to sound: noise is often defined as unwanted sound.
Ambient noise level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the measured presence to the reference pressure, which his 20 micropascals.
A weighted sound pressure level (dBA)	The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighted filter de-emphasizes the very low and the very high-frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Hertz (Hz)	A unit of measure of frequency; the number of cycles per second of a periodic waveform.
Infrasound	According to the International Electrotechnical Commission (IEC) 1994, infrasound is acoustic oscillations whose frequency is below the low-frequency limit of audible sound (about 16 Hz). However, this definition is incomplete as infrasound at high enough levels is audible at frequencies below 16 Hz. (IEC 1994)
Low-frequency sound	Sound in the frequency range that overlaps the higher infrasound frequencies and the lower audible frequencies; it is typically considered as 10 Hz to 200 Hz but is not precisely defined.

Table I-2: Typical Sound Pressure Levels Measured in the Environment and Industry

Noise Source at a Given Distance	A-Weighted Sound Level in Decibels	Qualitative Description
Carrier deck jet operation	140	
	130	Pain threshold
Jet takeoff (200 feet)	120	
Auto horn (3 feet)	110	Maximum vocal effort
Jet takeoff (1000 feet) Shout (0.5 feet)	100	
N.Y. subway station Heavy truck (50 feet)	90	Very annoying Hearing damage (8-hour, continuous exposure)
Pneumatic drill (50 feet)	80	Annoying
Freight train (50 feet) Freeway traffic (50 feet)	70-80	
	70	Intrusive (Telephone use difficult)
Air conditioning unit (20 feet)	60	
Light auto traffic (50 feet)	50	Quiet
Living room Bedroom	40	
Library Soft whisper (5 feet)	30	Very quiet
Broadcasting/Recording Studio	20	
	10	Just audible
Adapted from Table E, "Assessing and Mitigation Noise Impacts," New York Department of Environment Consultation 2001.		

ANTICIPATED NOISE DURING CONSTRUCTION AND OPERATION

During construction, equipment used for assembly and erection of structures, wire pulling and splicing will generate noise. Noise from construction activities would be audible to nearby users; however, because the Project is surrounded by private property, users in the area are limited to a small number of people, and because construction would only occur during daytime hours when tolerance to noise is higher, it would not be considered a major impact. Noise from construction would be temporary, lasting only between the start of construction and operation.

Anticipated noise associated with the Project Substation and Gen-tie would primarily be temporary and construction related. However, certain electromagnetic effects are inherently associated with substations and overhead transmission facilities. The primary effect of electric and magnetic fields is corona discharge. Corona effects are manifest as audible noise, radio interference, and television interference. These particular effects are minimized by line location, line design, and construction practices.

Corona

Under certain conditions, the localized electric field near an energized conductor can be sufficiently concentrated to produce a tiny electric discharge that can ionize air close to the conductors (Electric Power Research Institute [EPRI] 1982). This partial discharge of electrical energy is called corona discharge, or corona. This physical manifestation can transform and discharge energy into very small amounts of sound, radio noise, heat, and chemical reactions of the air components. Several factors, including conductor voltage, shape, diameter, and surface irregularities such as scratches, nicks, and dust, can affect a conductor's electrical surface gradient and its corona performance.

Audible Noise

Audible noise would be created by corona discharge at the Project Substation and along the Gen-tie. As a result, the amount of audible noise is directly related to the amount of corona, which is in turn affected by meteorological conditions (most notably precipitation). Transmission line audible noise is categorized into broadband high-frequency tones, which are best described as humming sounds.

Because power loss is uneconomical and noise is undesirable, corona on transmission lines has been studied by engineers since the early part of the last century. Historical measurements along transmission corridors of similar makeup (open desert) have shown typical ambient audible noise levels in the range of 43 to 52 dBA with an average value of 50 dBA. References exist on the subject of transmission line corona (e.g., EPRI 1982). Consequently, corona is well understood by engineers, and steps to minimize it are one of the major factors in transmission line design for extra high-voltage transmission lines (345-765kV). Because audible noise levels are low, corona is usually not a design issue for power lines rated at 230kV and lower (Parmar 2014; Pacific Gas and Electric [PG&E] 2005).

Radio Interference

Overhead transmission lines do not, as a general rule, interfere with normal radio or TV reception. There are two potential sources of interference: corona and gap discharges. Gap discharges cause short pulses of voltage and current to be propagated along the transmission line, resulting in radio frequency noise in the vicinity of the line. Gap discharges are different from corona and can occur in low-voltage distribution lines. Gap discharges are most commonly caused by loose hardware. Gap discharges comprise a large percentage of all interference problems and are easily remedied.

Corona-caused radio interference impact is dependent on various factors, including distance from the line to the receiver, radio signal strength, ambient radio noise level, receiving antennae orientation, and weather conditions. Even though radio reception quality is reduced by nearby transmission lines during periods of rainy weather, the impact is expected to be minimal based on the low frequency of inclement weather in the Study Area.

Television Interference

Traditional television broadcasts occur in three ranges: 54 to 88 MHz (Channel 2-6); 174 to 216 MHz (Channels 7-13); and 470 to 890 MHz (Channels 14-83). Transmission line interference reduces with increasing frequency above 100 MHz. Consequently, television interference only affects the lower Very High Frequency (VHF) band (Channels 2-6) and no interference will be experienced in the upper VHF (Channels 7-13) and Ultra High Frequency (UHF) bands (Channels 14-83) even during foul weather. Where transmission line-generated television interference has been found to be a problem, it is generally the result of induced voltage on fences, conductors, and hardware that are adjacent to the Right-of-Way. In these situations, the interference can be easily corrected by grounding the objects, or by realigning, relocating, or providing higher-gain television antennas. However, with the increasingly popularity of newer technologies such as cable, satellite, and digital television, transmission line television interference problems warranting any sort of corrective action are especially unlikely.

Electric Fields

Electric fields can be found occurring naturally in the word and typically occur in range of 12 to 150 kV/meter (kV/m). Electric fields created by televisions and other video display units typically occur in the range of 20 kV/m. Electric fields directly under a 500kV transmission line are typically about 30 kV/m. Magnetic fields can be found naturally occurring and typically occur in the range of 0.01 nanotesla (nT). Magnetic fields that occur under a transmission line typically occur in the range of 10 to 30 microtesla (uT). These electromagnetic fields reduce quickly the further removed from the source. Figure I-1 shows typical electromagnetic field (EMF) levels and dissipation of this energy as it is further removed from a transmission facility.

POTENTIAL EFFECTS

Construction

Table I-3: Typical Noise Levels of Construction Equipment

Table I-3 presents typical noise levels of construction equipment at a distance of 45 feet (15 meters) (Crocker and Kessler 1982). These values assume that the equipment is operating at full power.

Equipment Category	Noise Level at 45 feet (15 meters) (dBA)
Dump Truck	88
Portable Rock Drill	88
Concrete Mixer Truck	85
Pneumatic Tool	85
Grader	85
Backhoe	81
Dozer	78

The data presented in Table I-3 indicates that there would be a temporary increase in ambient noise within 45 feet of construction activities occurring within the Project corridor. The nearest residences to the Project are located 2,800 feet (0.53 mile) from both the alternate and preferred Gen-tie corridors. Many environmental factors need to be considered when determining the distance that noise travels, such as terrain, density of vegetation, temperature, and the amount of moisture in the air. Based on the distance to residences and the intervening vegetation, construction noise from over 2,800 feet away would be limited to daytime hours and cease after construction, which is approximately 5 months long.

Operation

Figure I-1 presents EMF levels associated with transmission lines. Interference levels for power lines rated at 500kV and lower, both in fair weather and in rain, dissipate quickly and typically are non-detectible at the Right-of-Way edge, and will usually meet or exceed reception guidelines of the Federal Communications Commission (PG&E 2005). Because this is a typical 500kV transmission line, interference levels will be non-detectable, and the proposed facilities will not cause operational impacts to communication systems that may be located in the Study Area.

In addition to impacts to communication systems, coronas also produce an audible noise. The highest calculated audible noise levels from the transmission design during foul weather (rain) may reach 55.9 decibels measured on an “A” weighted (dBA) scale at the edge of either the alternate or preferred Gen-tie. During fair weather, the audible noise at the edge of the Project area is significantly reduced with a maximum value of 35.9 dBA.

As previously mentioned, the nearest residences to the preferred and alternate Gen-tie corridors are located over 2,800 feet away and existing 500kV and 345kV transmission lines already traverse the Study Area. Noise from operation of the Gen-tie transmission line would have a negligible increase on noise levels and would not be noticeable either outside or within the nearest residence; therefore, no impacts to nearby residences are anticipated by the operation of these facilities.

Corona-generated radio interference is most likely to affect the amplitude modulation (AM) broadcast band (535-1,605 KHz); frequency modulation (FM) radio is rarely affected. Only AM receivers located very near to transmission lines have the potential to be affected by radio interference.

Satellite television signals are much higher frequency than transmission line frequencies and are not affected by transmission line operation or corona. Cable television service is likewise unaffected. Specific instances of broadcast television reception interference are nearly always related to spark-gap discharges due to lose, worn, or defective hardware. No significant impacts to radio or television reception are anticipated as a result of constructing and operating the Gen-tie Project Substation and Gen-tie. Cellular phone antennae and microwave receivers are commonly mounted on transmission structures to take advantage of the added height afforded by the structures, which demonstrates that transmission lines do not interfere with cellular phone tower operations or microwave communication paths.

For these reasons, noise and communication signal interference associated with operation of the Project is not anticipated.

REFERENCES

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Bonneville Power Administration. 1994 (Finalized 1996). Electrical and Biological Effects of Transmission Lines: A Review. (DOE/BP 2938 December 1996 IM) Portland, OR.

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International Electrotechnical Commission. 1994. International Electrotechnical Vocabulary – Chapter 801: Acoustics and electroacoustics: 60050-801.

M.J. Crocker and F.M. Kessler. 1982. Noise and Noise Control, Vol. II. CRC Press. Boca Raton, FL.

New York Department of Environmental Conservation. 2001. *Assessing and Mitigation Noise Impacts.* Report No. DEP-00-1rev.2/2/01.

Pacific Gas and Electric Company (PG&E). 2005. Delta Distribution Planning Area Capacity Increase Substation Project, Proponent's Environmental Assessment, Chapter 16 Induces Currents and Corona Effect. August 2005.

Parmar, Jignesh. 2014. Electrical Notes. Rev 1.11.2014. Pg. 356. Available on the web at: **https://www.electricalnotes.wordpress.com**.

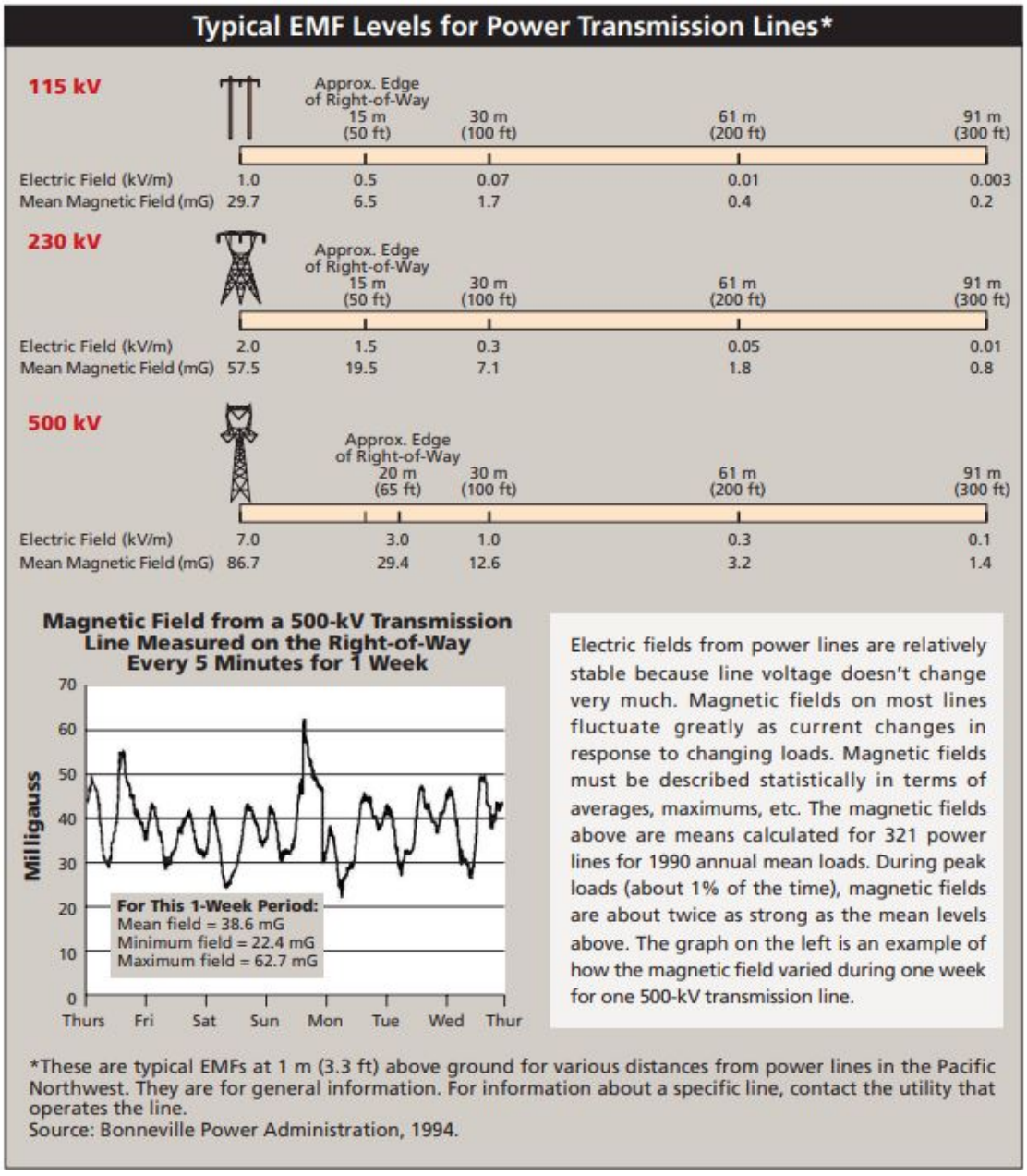


Figure I-1: Typical EMF levels for power transmission lines

EXHIBIT J – SPECIAL FACTORS

Arizona Revised Statutes (ARS) §40-360 et seq. established the Power Plant and Transmission Line Siting Committee in 1971. ARS §40-360.06(A)(9) stipulates "any additional factors that require consideration under applicable federal and state laws pertaining to any such site" are among the factors the Siting Committee must consider in reviewing CEC applications. As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219,

> *"Describe any special factors not previously covered herein, which applicant believes to be relevant to an informed decision on its application."*

PUBLIC INVOLVEMENT

Notification Letters

As part of the Navajo County Special Use Permit process for the solar facility site, the Applicant sent public notification via first-class mail to all property owners within 1.5 miles of the solar facility two weeks prior to the public open house meeting, notifying them of a public open house meeting. The notification contained a project overview, project map and details for the public open house meeting, including the type of information that would be available at the meeting, and contact information for the Applicant. A copy of the public notification post card and other public open house materials is included below (Appendix J-1).

Public Open House Meeting – The Applicant held a public open house meeting on May 15, 2019, at the Joseph City Fire District, located at 4513 Main Street, Joseph City, AZ 86032. The meeting was held as an open house style format, which allowed attendees the ability to walk around the meeting facility, review information and talk with Invenergy project team representatives; no formal presentation was given. Upon entering the meeting facility, attendees were asked to sign-in and were provided with a comment form, project fact sheet and a one-pager detailing information about Invenergy's solar capabilities. Once in the main room, there were five different poster boards (24"x36" each) for attendees to review including: 1) Project location, 2) Project specific facts, 3) Solar portfolio, 4) Construction details and 5) Project timeline. Project team members were available throughout the evening to address questions and concerns from the public attendees.

Attendees – There were a total of 11 lines filled out on the sign-in sheet, which included individuals as well as couples. There were also a few people who did not sign-in upon entering. The total amount of attendees was estimated to be 15, which included private property owners as well as some Navajo County staff. The Hashknife Solar Energy Center team included four Invenergy employees and three consultants from Burns & McDonnell.

Questions/Comments – some examples of questions asked by the public include:

- Can the project be constructed in a different location or on different property?
- How did you identify the land you needed for the project and are you interested in adding more land that is adjacent to the project area?
- How will you work with local landowners as the project progresses?
- What is the cost of solar energy to customers? Will this affect my bill?
- Can we get copies of the presentation to show to the County Board of Supervisors?
- Can we get more information regarding community support, what types of activities does Invenergy do within the community?
- How much wind vs. solar generating capacity does Invenergy have in its portfolio?
- Who will benefit from the project?
- Will the project create any new jobs?

- When will the project be built and how is it constructed?
- What permits and/or approvals are required?

No comment forms were received the night of the open house meeting; however, the comment form provided Invenergy contact information for where attendees can submit their comments. No comment forms were received after the open house meeting.

TRIBAL CONSULTATION

The Applicant initiated consultation on March 2, 2020, via letter requesting comments within 30 days. The letter was sent to representatives of eight tribes that might have an interest in the Project:

- Kaibab Band of the Paiute
- Navajo Nation
- Paiute Tribe of Utah
- San Carlos Apache Tribe
- White Mountain Apache Tribe
- Hopi Tribe
- Las Vegas Tribe of the Paiute
- Moapa Band of the Paiute

Burns & McDonnell received a response from the Navajo Nation (dated April 9, 2020), which stated that after reviewing the letter and cross referencing their Traditional Cultural Properties (TCPs) database maps, ***TOOH*** (Little Colorado River) identified as TCPs # 342 on their maps is located within the Project area (J-2). The Historical Preservation District-TCP has determined that the solar and storage energy facility project will not have an adverse effect on the TCP and Invenergy may proceed without further consultation for this project. However, in the event of a discovery [*"discovery"* means any previously unidentified or incorrectly identified cultural resources including but not limited to archaeological deposits, human remains, or locations reportedly associated with Native American religious/traditional beliefs or practices], all operations in the immediate vicinity of the discovery must cease, and Hashknife must contact their office.

Burns & McDonnell also received a response from White Mountain Apache Tribe (dated March 6, 2020), which stated that upon reviewing the information provided, it has been determined that the proposed project plans will not have an adverse effect on the tribe's historic properties and/or traditional cultural resources.

Burns & McDonnell received a third response from San Carlos Apache Tribe (dated March 5, 2020), which stated it has been determined that there are no properties of religious and cultural significance to the Tribe that are listed on the National Register within the area of potential effect or that the proposed project will have no effect on any such properties that may be present. In addition, the Tribe concurs with the report findings and defers to the Tribe located nearest to the project area (Navajo & Hopi).

BURLINGTON NORTHERN SANTA FE RAILWAY

As both of the preferred and alternate Gen-tie alignments come into the Cholla Substation at the Cholla Power Plant, they cross over a section of railroad owned by BNSF. In order to put BNSF on notice about the project, Burns & McDonnell, on behalf of Invenergy, sent a letter to their General Director of Right-of-Way & Real Estate Management dated March 18, 2020 (Appendix J-3). The letter detailed the Project and offered BNSF an opportunity to provide their input, comments, and concerns.

Follow up calls have been made but at the time of submitting this CEC application, no response has been received from BNSF. Once plans for the Gen-tie alignment have been finalized, Invenergy will apply for a Wire Line Crossing Permit with BNSF and will provide the required submittal items.

ARIZONA GAME AND FISH DEPARTMENT

Invenergy met with AGFD on May 15, 2019 to discuss the Project. Based on Invenergy's preliminary Tier 1 and Tier 2 review, which included a site visit and habitat characterization of the site, AGFD had no concerns for wildlife, including wildlife corridors, within the Project location as indicated in their letter attached as Appendix J-4. Invenergy plans to continue coordination with AGFD as the Project develops.

ARIZONA STATE LAND DEPARTMENT

A portion of the Solar Facility will include one section (640 acres) of land currently owned by ASLD. Invenergy has been in coordination with ASLD on receiving the proper authorizations to include ASLD's section of land within the Solar Facility. In doing so, Invenergy received a letter from ASLD on March 15, 2019 (Appendix J-5) that gave Invenergy permission to perform due diligence on ASLD lands, including an American Land Title Association (ALTA) Survey, Phase 1 Environmental Site Assessment and Class III Cultural Resource Survey. Invenergy plans to continue coordination with ASLD as the Project develops.

APPENDIX J-1 – PUBLIC OPEN HOUSE MATERIALS

Hashknife Solar Energy Center

INVITES YOU TO A PUBLIC OPEN HOUSE

Invenergy, LLC is conducting a public open house to provide information about the **Hashknife Solar Energy Center,** a proposed 300 megawatt (MW) solar facility in Navajo County, AZ. This solar facility would provide enough renewable energy to power approximately 70,000 homes.

The public is invited to attend the public open house to learn more about the project and ask questions of the project team.

For more information or to submit comments: **SInnis@invenergyllc.com**

Invenergy | Innovators building a sustainable world

Wednesday, May 15, 2019
6:00 - 8:00 p.m.

Joseph City Fire District
4513 Main Street, Joseph City, AZ 86032

Learn about the innovative photovoltaic technology

Understand the benefits to you and the community

Review preliminary plans

Ask questions and provide feedback

Invenergy
1401 17th Street, Suite 1100
Denver, CO 80202

All questions and comments are due to the team by May 31, 2019.

Invenergy drives innovation in energy. Invenergy and its affiliated companies develop, own, and operate large-scale renewable and other sustainable energy generation and storage facilities in the Americas, Europe and Asia. Learn about Invenergy at Invenergyllc.com.

Hashknife Solar Energy Center

Invites You to a Public Open House

Wednesday, May 15, 2019
6:00 - 8:00 p.m.

Joseph City Fire District
4513 Main Street
Joseph City, AZ 86032

For more information or to submit comments, contact:
SInnis@invenergyllc.com

- Learn about the innovative photovoltaic technology
- Understand the benefits to you & the community
- Review preliminary plans
- Ask questions & provide feedback

The **Hashknife Solar Energy Center** is a proposed 300 megawatt (MW) solar facility in Navajo County, AZ. This solar facility would provide enough renewable energy to power approximately 70,000 homes.

Invenergy, LLC invites the public to attend the open house to learn more about the project and ask questions of the project team.

All questions and comments are due by May 31, 2019.

Invenergy | Innovators building a sustainable world

Invenergy drives innovation in energy. Invenergy and its affiliated companies develop, own, and operate large-scale renewable and other sustainable energy generation and storage facilities in the Americas, Europe and Asia. Learn about Invenergy at Invenergyllc.com.

Invenergy

Hashknife Solar Energy Center Project

Open House: Wednesday, May 15, 2019 6:00-8:00 pm
Joseph City Fire District

Sign in

(please print)

	Name/Company	Address (please include street, city and zip code)	Telephone # with area code and/or email address
	J.R. DeSpain	Box 159 Joseph City	928-241-0399
	Paul Watson	Box 2116 Pinetop	928-243-3137
	Sandy Phillips	P.O. Box 6608 Holbrook	928-524-4233
APS	Neil Traver	2301 W 7th Street Snowflake	480 262 6924
APS	Brian Wallace	2200 E Huntington Dr	928 773 6306
Sandia	James and Sarah Brimhall	625 E Nora Pinetop	505 218 2863
	Sindy DeSpain	7500 OBED Ranch	928-587-6062
land NOB 40.	Gary Hansen	8108 S Richards JC	850-209-0868
	Ruth Hansen	8108 S Richards	850 209 7353
	John Osgood	100 Public Works Dr. Holbrook	928-524-4100
by APS plant	Boyce Hunt	7820 Hunt Rd. Joseph City, AZ	928-386-6205

Invenergy

Hashknife Solar Energy Center

The Hashknife Solar Energy Center is a proposed 300 megawatt solar power generation facility in Navajo County, AZ targeted to begin operations in 2023.

Enough electricity to power more than **70,000 homes**

Millions of dollars invested in the economy through taxes and land payments

375 jobs supported during construction

3-5 full-time operations and maintenance staff

Using the most up-to-date, innovative photovoltaic technology

300 megawatts of renewable energy

Supports local education, emergency & veteran services and environmental stewardship

Project Timeline

2019–2021	2022	2023
Development Activities include solar assessment, environmental studies, interconnection studies, permitting etc.	**Construction** Estimated ~6-8 months	**Operation** Target operational date with a project life of 20 years

Invenergy's Grand Ridge Energy Center located in LaSalle County, Illinois.

About Invenergy

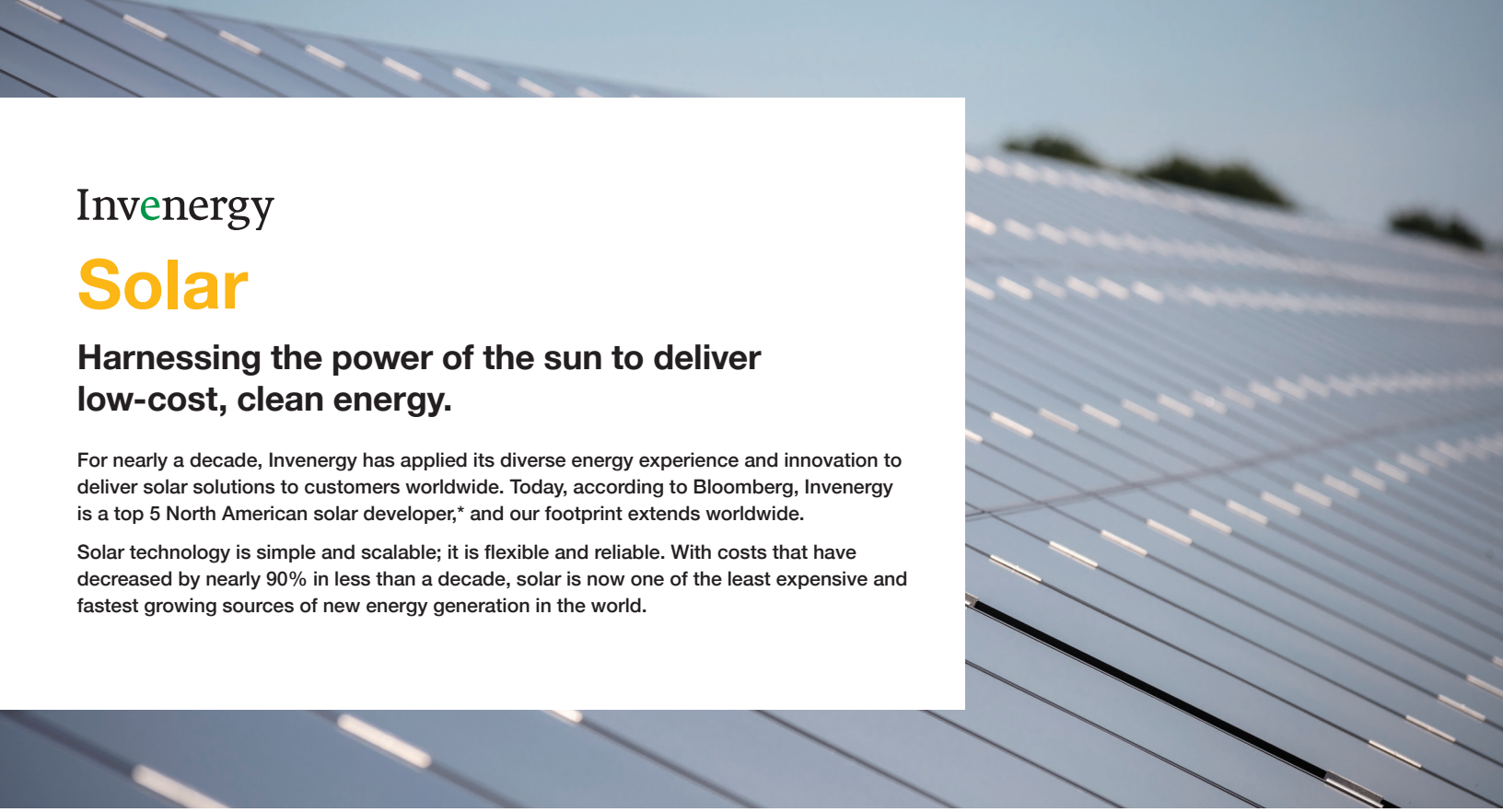
Invenergy is America's leading, privately-held developer and operator of sustainable energy solutions.

A U.S. based company that develops, owns and operates clean energy facilities in the Americas, Europe and Asia.

Invenergy has successfully developed more than 146 projects, totaling over 22,600 megawatts, including wind, solar, natural gas power generation and advanced energy storage projects.

sinnis@invenergyllc.com | 303.557.4502 | 1401 17th Street | Suite 1100 | Denver, Colorado 80202

invenergyllc.com



Invenergy

Solar

Harnessing the power of the sun to deliver low-cost, clean energy.

For nearly a decade, Invenergy has applied its diverse energy experience and innovation to deliver solar solutions to customers worldwide. Today, according to Bloomberg, Invenergy is a top 5 North American solar developer,* and our footprint extends worldwide.

Solar technology is simple and scalable; it is flexible and reliable. With costs that have decreased by nearly 90% in less than a decade, solar is now one of the least expensive and fastest growing sources of new energy generation in the world.

Invenergy Solar: Low cost. High capacity. Tailored to your needs.

Projects

Operating, in contruction & contracted

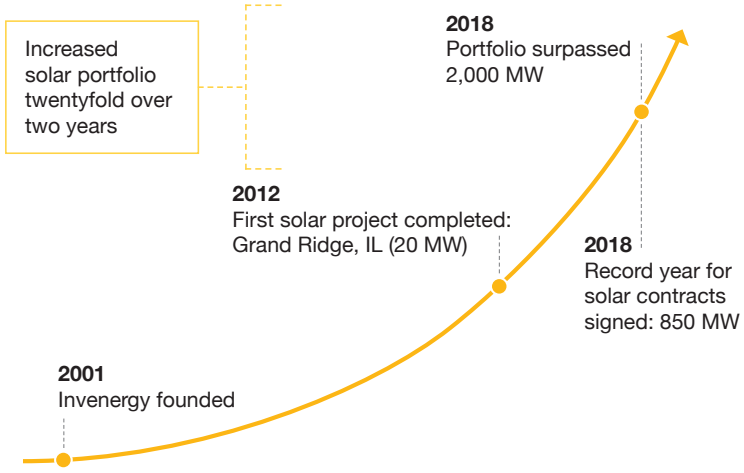
27
Projects

3,180
Megawatts

Development pipeline

30,000+
Megawatts

Capacity Growth



Innovative Solar Test Facility

Our new Brookfield solar test facility at Invenergy's award-winning Grand Ridge Energy Center in LaSalle County, IL features both monofacial and bifacial panels in various configurations. By analyzing different panels and configurations, we are able to optimize how panels perform in a utility setting.

Preferred Partner to Utilities & Corporate Customers

MGM

Dry Lake Solar (100 MW): Will deliver 90% of electricity demand for MGM properties on the Las Vegas strip

WI

Badger Hollow (150 MW): Helping Wisconsin utilities WEC and MG&E meet their sustainability goals

Georgia Power

Southern Oak (160 MW): Fueling Georgia Power's Renewable Energy Development Initiative

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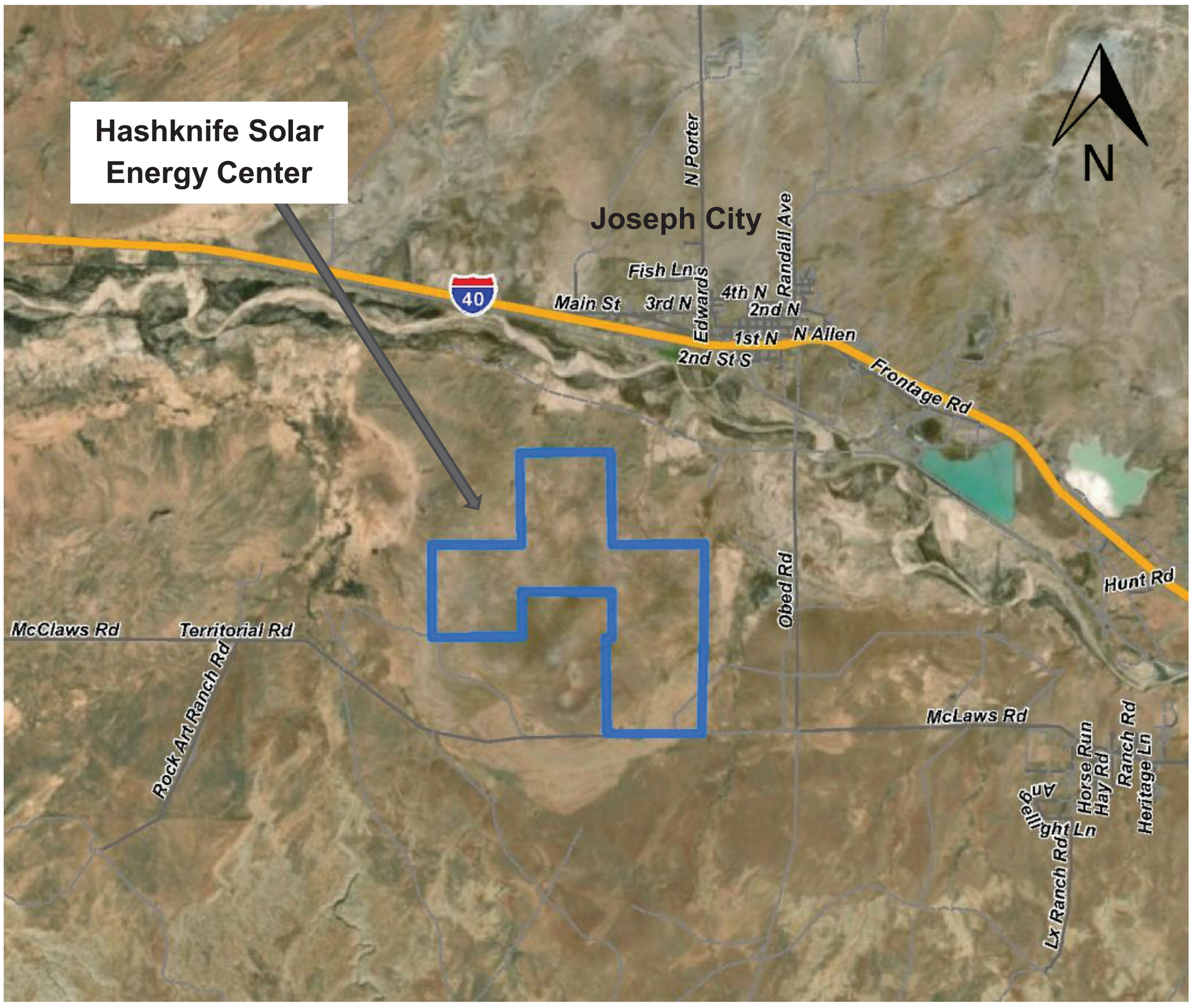
Project Location

The proposed Hashknife Solar Energy Center is located south of Joseph City, northwest of the corner of Obed Road and Territorial Road.



Hashknife Solar Energy Center

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Solar Construction

Step 1:
Clearing, grading and fencing

Step 2:
Pile drive racking posts

Step 3:
Install fixed tilt racking system

Step 4:
Trenches for collection line systems

Step 5:
Install solar modules

Step 6:
Install electrical collection system

Step 7:
Install inverter/ transformer

Step 8:
Solar farm is operational

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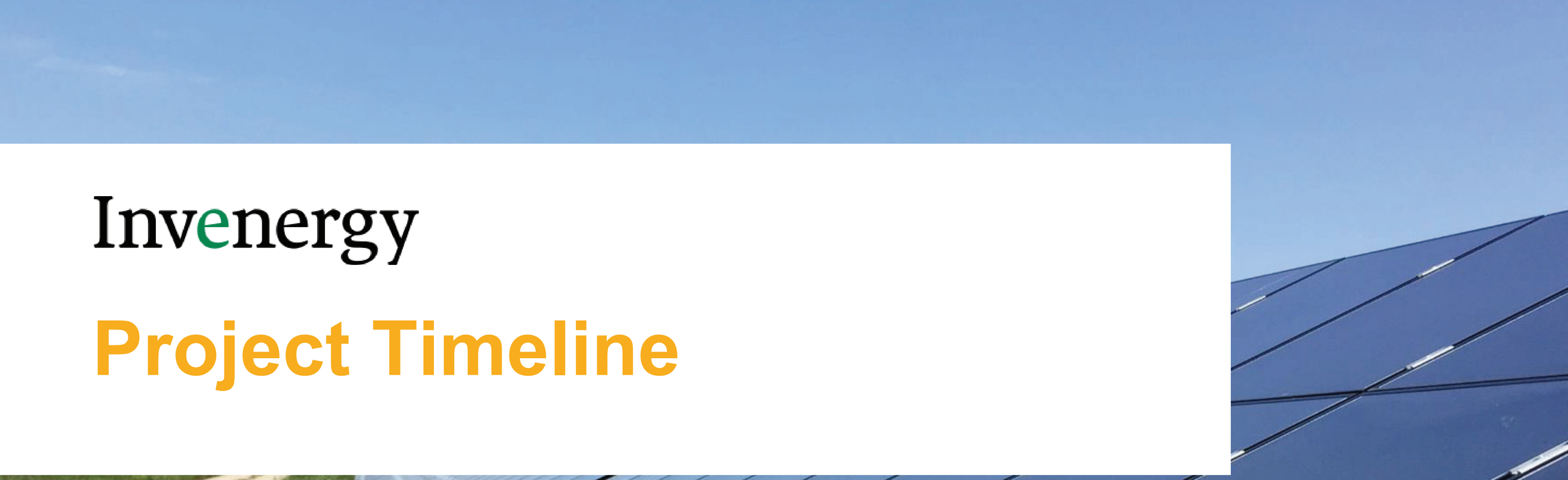

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Project Timeline

Development

Navajo County Conditional Use & Special Use Permit Review.
State Powerline Siting Committee Review.
Civil site work beginning late 2019.

2019-2021

Construction

Expected to take ~6-8 months.

2022

Operation

2023

Hashknife Solar Energy Center

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APPENDIX J-2 – TRIBAL RESPONSE LETTERS

Received from Tribal Admin 05/20/20

E-mailed 05/21/20 VN (initials & date)

Scanned 05/21/20 VN (initials & date)

SAN CARLOS APACHE TRIBE
Historic Preservation & Archaeology Department
P.O. Box 0
San Carlos Arizona 85550
Tel. (928) 475-5797, apachevern@yahoo.com

Tribal Consultation Response Letter

Date: March 5, 2020
Contact Name: Robert A. Rowe (303) 583-0339/rarowe@burnsmcd.com
Company: Burns McDonnell
Address: 9785 Maroon Circle Suite 400 Centennial, CO 80112
Project Name/#: Hashknife Energy Center, Navajo County, Arizona, Soliciting Questions or Comments

Dear Sir or Madam:

Under Section 106 and 110 of the National Historic Preservation Act, we are replying to the above referenced project. Please see the appropriate marked circle, including the signatures of Vernelda Grant, Tribal Historic Preservation Officer (THPO), and the concurrence of the Chairman of the San Carlos Apache Tribe:

☒ **NO INTEREST/NO FURTHER CONSULTATION/NO FUTURE UPDATES**
We defer to the Tribe located nearest to the project area.

☒ **CONCURRENCE WITH REPORT FINDINGS & THANK YOU** – We defer to Navajo THPO & Hopi-CPR

○ **REQUEST ADDITIONAL INFORMATION**
I require additional information in order to provide a finding of effect for this proposed undertaking, i.e. Project description ___ Map ___ Photos ___ Other _____

☒ **NO EFFECT**
I have determined that there are no properties of religious and cultural significance to the San Carlos Apache Tribe that are listed on the National Register within the area of potential effect or that the proposed project will have no effect on any such properties that may be present.

○ **NO ADVERSE EFFECT**
Properties of cultural and religious significance within the area of effect have been identified that are eligible for listing in the National Register for which there would be no adverse effect as a result of the proposed project.

○ **ADVERSE EFFECT**
I have identified properties of cultural and religious significance within the area of potential effect that are eligible for listing in the National Register. I believe the proposed project would cause an adverse effect on these properties. Please contact the THPO for further discussion.

We were taught traditionally not to disturb the natural world in a significant way, and that to do so may cause harm to oneself or one's family. Apache resources can be best protected by managing the land to be as natural as it was in pre-1870s settlement times. Please contact the THPO, if there is a change in any portion of the project, especially if Apache cultural resources are found at any phase of planning and construction. Thank you for contacting the San Carlos Apache Tribe, your time and effort is greatly appreciated.

DIRECTOR/THPO: _____ 05/01/20
Vernelda J. Grant, Tribal Historic Preservation Officer — Date

CONCURRENCE: _____ 5/11/20
Terry Rambler, Tribal Chairman — Date

Holscher, Derek

From: Rowe, Robert A (Bob)
Sent: Thursday, April 9, 2020 12:35 PM
To: Dean, David A (Dave); Holscher, Derek; Simpson, Randall L
Subject: Fwd: RIGHT-OF-WAY 3.5 MILE-LONG TRANSMISSION LINE

Get Outlook for iOS

From: Rowe, Robert A (Bob) <rarowe@burnsmcd.com>
Sent: Thursday, April 9, 2020 11:34
To: Timothy Begay
Subject: Re: RIGHT-OF-WAY 3.5 MILE-LONG TRANSMISSION LINE

Thank you sir

Get Outlook for iOS

From: Timothy Begay <tbegay@navajo-nsn.gov>
Sent: Thursday, April 9, 2020 11:30:27 AM
To: Rowe, Robert A (Bob) <rarowe@burnsmcd.com>
Subject: RIGHT-OF-WAY 3.5 MILE-LONG TRANSMISSION LINE

Dear Mr. Rowe:

The Navajo Nation Heritage and Historic Preservation Department's (NNHPD) Traditional Culture Program is (TCP) in receipt of your letter regarding Burns & McDonnell is assisting Hashknife Energy Center LLC with permitting the a planned photovoltaic solar and storage energy facility, near the town of Joseph City, Navajo County.

After reviewing your letter and cross referencing our Traditional Cultural Properties (TCP's) database maps, ***TOOH*** (Little Colorado River) identified as TCPs # 342 on our maps is located within project area. HPD-TCP has determined that the solar and storage energy facility project will not have an adverse effected on the TCP and you may proceed without further consultation for this project.

However, in the event of a discovery ["*discovery*" means any previously unidentified or incorrectly identified cultural resources including but not limited to archaeological deposits, human remains, or locations reportedly associated with Native American religious/traditional beliefs or practices], all operations in the immediate vicinity of the discovery must cease, and contact our office.

If you have any additional questions, concerns or would like to discuss these issues further, please don't hesitate to contact our office at (928) 871-7198 or (928) 871-7152. Thank you for your cooperation and understanding.

Sincerely,

Timothy C. Begay, Navajo Cultural Specialist
Navajo Nation Heritage and Historic Preservation Department
P.O. Box 4950
Window Rock, AZ 86515

tbegay@navajo-nsn.gov

White Mountain Apache Tribe

Office of Historic Preservation
PO Box 1032
Fort Apache, AZ 85926
Ph: (928) 338-3033 Fax: (928) 338-6055

To: Robert A. Rowe, RPA – Burns McDonnell Principal Investigator

Date: March 6, 2020

Re: *Hashknife Energy Center, Navajo County, Arizona, planned Photovoltaic Solar Facility*

The White Mountain Apache Tribe Historic Preservation Office appreciates receiving information on the project dated; March 2, 2020. In regards to this, please attend to the following statement below.

Thank you for allowing the White Mountain Apache tribe the opportunity to review and respond to the above proposed development of the photovoltaic solar and storage energy facility in central Navajo County south of Joseph City, Arizona. Upon reviewing the information provided, we've determined the proposed project plans will ***"Not have an Adverse Effect"*** on tribe's historic properties and/or traditional cultural resources.

Thank you for your continued collaborations in protecting and preserving places of cultural and historical importance.

Sincerely,

Mark T. Altaha

White Mountain Apache Tribe – THPO
Historic Preservation Office

APPENDIX J-3 – BURLINGTON NORTHER SANTA FE RAILWAY CORRESPONDENCE

March 18, 2020

Mark Norton
General Director – R.O.W & Real Estate Management
BNSF Railway
2301 Lou Menk Drive
GOB-3W
Fort Worth, TX 76131-2830

Re: Hashknife Energy Center LLC, Navajo County, AZ, Soliciting Questions or Comments

Dear Mr. Norton:

Burns & McDonnell (BMcD) is assisting Hashknife Energy Center LLC with permitting the Hashknife Energy Center (the Project), a planned photovoltaic solar and storage energy facility, in central Navajo County. The Project is anticipated to produce approximately 400 megawatts of electricity, using ground-mounted photovoltaic solar panels. The Project is located on approximately 3,840 acres of state and privately-owned rangeland currently used for grazing livestock located south of Joseph City, immediately to the southwest of the Cholla Energy Plant. The Project would connect to the existing electrical grid via a 500-kilovolt transmission line.

Two transmission line alternatives are being considered, as illustrated on the attached map. Both transmission line alternatives have a point of interconnection at the Cholla substation at the Cholla Energy Plant, which is owned and operated by Arizona Public Service Company. The preferred route will be 3.5-miles of new transmission right-of-way that will leave the Cholla substation heading west. The alternative route is a 3.0-mile-long transmission line, which parallels existing transmission line right-of-way and will leave the Cholla substation heading southwest. Both transmission alternatives will cross a railroad owned and maintained by BNSF Railway as they leave the Cholla substation. The preferred transmission line route will cross the railroad in the SE ¼ of Section 22, Township 18 North, Range 19 East and the alternative route will cross the railroad in the NW ¼ of Section 26, Township 18 North, Range 19 East; there are existing transmission lines that currently cross the railroad in this location. Prior to construction of the transmission line and when more detailed engineering plans are available, Hashknife Energy Center LLC will apply to BNSF Railway for a wireline crossing.

The Project has received a Special Use Permit from Navajo County to construct and operate the solar and energy storage facility. The Project will need to obtain a Certificate of Environmental Compatibility (CEC) from the Arizona Corporation Commission. The CEC application will require an Exhibit J that discusses Special Factors, including Public Involvement. As part of the Public Involvement process, Hashknife Energy Center LLC is sending letters out to landowners and agencies in the vicinity notifying them about the Project. On behalf of Hashknife Energy Center LLC, BMcD requests any initial questions or comments about the Project. Any information you provide will be appreciated and can be incorporated into Exhibit J of the CEC

9785 Maroon Circle \ Suite 400 \ Centennial, CO 80112
O 303-721-9292 \ **F** 303-721-0563 \ burnsmcd.com

application to the Arizona Corporation Commission. We respectfully request your input within 30 days of the date of this letter. Please feel free to contact me at 303.474.2204 or *dholscher@burnsmcd.com* if you have any questions or comments.

Sincerely,

Derek Holscher
Project Manager – Environmental Services
dholscher@burnsmcd.com
303.474.2204

APPENDIX J-4 – ARIZONA FISH & GAME DEPARTMENT CORRESPONDENCE

May 26, 2020

ATTN: Quentin Stuart
Invenergy
1401 17th Street, Suite 1100
Denver, CO 80202
RE: Hashknife Energy Center Special Use Permit

Re: **Arizona Solar Energy Project Discussion; Hashknife Solar Energy Project**

Dear Mr. Stuart,

The Arizona Game and Fish Department (Department) met with Invenergy on May 15, 2019 regarding the Hashknife Solar Energy Project in Navajo County. Based on this meeting, it is the Department's understanding Invenergy is proposing to construct a 300 MW DC Solar Farm on approximately 2,800 acres of land located on private and state lands. The project will be a photovoltaic solar facility which includes a Battery Energy Storage System and will connect to a 500kV generation tie line. Based on Invenergy's preliminary Tier 1 and Tier 2 review which included a site visit and habitat characterisation of the site, and the Department's knowledge of the site, there are no concerns for wildlife, including Wildlife Corridors, within this project location at this time.

Under Title 17 of the Arizona Revised Statutes, the Department, by and through the Arizona Game and Fish Commission (Commission), has jurisdictional authority and public trust responsibilities for management of the state's fish and wildlife resources. It is the mission of the Department to conserve Arizona's diverse fish and wildlife resources and manage for safe, compatible outdoor recreation opportunities for current and future generations. As such, the Department looks forward to continued coordination with Invernergy on this project as it develops. If you have any questions regarding this letter, please do not hesitate to contact me directly at acavalcant@azgfd.gov or 623-236-7222.

Sincerely,

Andrew Cavalcant
Project Evaluation Specialist

M19-09091424

cc: Ginger Ritter, Project Evaluation Program Supervisor AGFD (gritter@azgfd.gov)

Dave Dorum, Habitat Program Manager, Region I
Jamie Wilson, Senior Associate, Invenergy (JWilson@invenergullc.com)

APPENDIX J-5 – ARIZONA STATE LAND DEPARTMENT CORRESPONDENCE

Douglas A. Ducey
Governor

Lisa A. Atkins
Commissioner

Arizona State Land Department

1616 West Adams, Phoenix, Arizona 85007
(602) 542-4631

March 15, 2019

Ms. Susan Innis
Senior Manager, Renewable Development
1401 17th Street, Suite 1100
Denver, CO 80202

Re: **37-205B** for **Application 03-120275**
Reimbursable Expenditures – Application No. 03-120275 (the "Application") Approximate 640 acres within Township 18 North, Range 18 East, Section 36 Arizona Revised Statute § 37-205(B)

Dear Ms.Innis:

This letter will serve as our permission for Invenergy Solar Development, LLC (the "Applicant") to perform work with respect to the Subject Property and receive reimbursements for the costs thereof pursuant to A.R.S. § 37-205(B); subject, however, to the terms and conditions delineated and set forth below:

I. The work will consist of reasonable consulting fees expended by the Applicant as described below:

A. ALTA Survey

An "ALTA" Survey, conforming to ALTA/NSPS Minimum Standard Detail Requirements (2016) including options, 1, 2, 4, 8, and 11, listed on the "Optional Survey Responsibility and Specifications Table A." The survey will also require a current preliminary title report including copies of the Schedule B items identified in the report to be supplied prior to commencing work. Further, the survey will require controlling the survey, setting property corners, easements, utilities and improvements that impact the subject property.

B. Environmental Site Assessment (Phase 1)

A Phase 1, Environmental Site Assessment done in accordance with ASTM Standard E1527-13 and described as follows:

The Phase 1 Environmental Site Assessment will conform to the current ASTM Standard and will include a site inspection, regulatory review, historical research and interviews. The Phase 1 Environmental Site Assessment will be overseen by a registered engineer or geologist. It is very important that **both the report cover page and signature pages shall be stamped by a professional engineer or geologist registered in the State of Arizona. The Arizona State Land Department ("ASLD") must be named as an additional addressee on the title page and in the text of the report.**

All work will be completed by registered engineers and land surveyors in the State of Arizona as required.

All reports and data shall be submitted in both hard copy (1) and in digital format.

C. PREPARE CLASS III CULTURAL RESOURCES SURVEY

Conduct a Class I records review covering the project and a one mile study area buffer. Please check the records held by the following repositories to determine if portions of the project area have been previously surveyed:

The State Historic Preservation Office (SHPO);
The Arizona Cultural Resources Database;
The General Land Office (GLO) plats and survey maps on file at the BLM State Office.

Conduct a Class III Survey (100% survey) by having a pedestrian field survey conducted by a crew of archaeologists walking parallel transects within the project parcel.

Cultural resources encountered within the project corridor that meet the State site definition shall be documented, mapped using a GPS, and photographed. Any site encountered during the Class III survey shall be evaluated for significance using the State/National Register of Historic Places criteria.

Following the conclusion of the field survey, please prepare a report conforming to State reporting specifications which shall include:
A brief culture history of the project area

A summary of previous research
The results of the fieldwork
Recommendations regarding the sites' NRHP eligibility
Recommendations regarding the need for further archaeological work.

Please send a copy of the draft report to Arizona State Land Department (ASLD) for review and allow for any comments by ASLD to be addressed in a revised draft report. Please provide copies of the revised draft report to ASLD and to the appropriate review agencies. Following the review agencies comments, please incorporate said comments and provide two (2) copies of the final report.

Once the final report is accepted by the appropriate review agencies and all agency consultation letters concurring with the project findings have been provided, please curate all project materials with the Arizona State Museum (ASM).

II. Pursuant to A.R.S. § 37-205(B), the proposed reimbursement will be made only if the successful bidder at an auction of the Subject Property is not the Applicant. The reimbursement will be made by the successful bidder on the terms directed in the auction notice. After receiving the reimbursement amounts, the ASLD Commissioner will remit the same to the Applicant.

III. The reimbursement for such work per A.R.S. § 37-205(B) will not exceed $40,000.00. The Applicant will supply ASLD with payment documentation, including but not limited to, detailed invoices and evidence of payment satisfactory to ASLD. The costs of the work will not include legal fees or administrative/operating expenses of the Applicant.

IV. **ASLD will be designated as an additional owner of all work produced pursuant to this letter.** The work will be delivered to ASLD no later than September 30, 2019 unless an extension is granted by the State Land Commissioner. No cost will be reimbursable and no payment will be made to Applicant unless all work product, including reports, data and other related information, is provided to ASLD on a timely basis and for purposes of placing the same in the Application file.

V. The cost of the work will not be reimbursed unless the Subject Property is presented at auction on or before June 30, 2020 and a successful bidder is declared.

VI. This letter will not be construed as requiring ASLD to offer the Subject Property at auction, nor will ASLD be liable for the costs of the work if the Subject Property is not offered at an auction, if there is no successful bidder at the auction, or ASLD does not receive the reimbursement amounts from the successful bidder.

Please acknowledge your agreement with this letter by signing and returning a copy of this letter to Ray Moore at the above address. Upon the receipt of the signed copy of this letter by ASLD, the work may be performed as set forth herein.

If you have any questions or concerns regarding this matter, please contact Ray Moore at (602) 364-1126, rmoore@azland.gov

Thank you.

Sincerely,

Wesley P. Mehl

c: File #03-120275

Applicant: Invenergy Solar Development, LLC acknowledges and agrees to the Terms and conditions of the foregoing letter.

By: _____

Name: James Williams

Title: VP Renewable Development

Date: 3/26/2019