DOCKETED	
Docket Number:	23-OPT-02
Project Title:	Darden Clean Energy Project
TN #:	253038-2
Document Title:	Appendix Q Biological Resources Assessment_Volume 2_Darden Clean Energy
Description:	Includes a Biological Resources Assessment which analyzes the potential impacts of the proposed Darden Green Energy Project and evaluates short and long term impacts of the Project to biological resources. Appendix Q-1 Regulatory Framework Appendix Q-2 Special-Status Species Evaluation Tables Appendix Q-3 Field Forms Appendix Q-4 Site Photographs Appendix Q-5 Species Compendia Appendix Q-6 San Joaquin Kit Fox Habitat Assessment Appendix Q-7 Swainson's Hawk Nesting Survey Report Appendix Q-8 Analysis of Project Impacts to Swainson's Hawk Foraging Habitat Appendix Q-9 Aquatic Resources Delineation Appendix Q-10 Aquatic Resources Representative Photographs Appendix Q-11 Delineation Data Sheets
Filer:	Evelyn Langsdale
Organization:	Rincon Consultants
Submitter Role:	Applicant Consultant
Submission Date:	11/7/2023 2:34:45 PM
Docketed Date:	11/7/2023

Appendix Q - Volume 2

Biological Resources Assessment

Appendix Q-7

Swainson's Hawk Nesting Survey Report

Rincon Consultants, Inc.
7080 North Whitney Avenue, Suite 101
Fresno, California 93720
559-228-9925

Project No: 22-12530

IP Darden I, LLC and Affiliates
c/o Intersect Power, LLC
9450 SW Gemini Drive PMB #68743
Beaverton, Oregon 97008-7105

Subject: Swainson's Hawk Survey Report for the Darden Clean Energy Project, Fresno County, California

This report documents the results of focused Swainson's hawk (SWHA; *Buteo swainsoni*) nesting surveys completed in support of environmental permitting for the Darden Clean Energy Project (Project). Surveys and reporting were completed by a joint team of Rincon Consultants (Rincon) and Stringer Biological Consulting, Inc (SBC) biologists.

Project Description and Location

The Project consists of the construction, operation, and eventual repowering or decommissioning of a 1,150 megawatt (MW) solar photovoltaic (PV) facility, an up to 4,600 megawatt-hour (MWh) battery energy storage system (BESS), an up-to 1,150 MW green hydrogen generator, a 34.5-500 kilovolt (kV) grid step-up substation, a 10 to 15-mile 500 kV generation intertie (gen-tie) line, a 500 kV utility switching station along the Pacific Gas and Electric Company (PG&E) Los Banos-Midway #2 500 kV transmission line, and appurtenances.

The Project site is located in an agricultural area of unincorporated Fresno County south of the community of Cantua Creek (Figure 1). The proposed solar facility, BESS, substation, and green hydrogen facility would be located on approximately 9,100 acres of land currently owned by Westlands Water District, between South Sonoma Avenue to the west and South Butte Avenue to the east. The proposed gen-tie line would span west from the intersection of South Sonoma Avenue and West Harlan Avenue to immediately west of Interstate 5, where it would connect to the proposed utility switchyard along PG&E's Los Banos-Midway #2 500 kV transmission line (Figure 2).

Methodology

Literature Review

SBC conducted a literature review to identify the location of previously documented SWHA nests within the Project site and a 0.5-mile buffer (study area). The following resources were reviewed for information on SWHA nest locations in the Project vicinity:

- iNaturalist (iNaturalist 2023)
- The Distribution and Abundance of Nesting Swainson's Hawks in the Vicinity of the Proposed RE Tranquility LLC Solar Generation Facility (Estep 2011)
- Distribution, abundance, and habitat associations of nesting Swainson's hawks in the central San Joaquin Valley, California (Estep and Dinsdale 2012)
- The Distribution and Abundance of Nesting Swainson's Hawks in the Vicinity of the Proposed RE Scarlet Solar Generation Facility (Estep 2016)

- California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB; CDFW 2023)
- SBC knowledge of SWHA nesting within the Project vicinity

Biologists then conducted a review of aerial imagery to document the location of potential nest trees within the study area and develop a field-approach to document all nests within the study area.

Nest Survey

The SWHA nesting surveys were conducted in the study area in accordance with the survey protocol outlined in the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (SWHA TAC 2000). The study area was surveyed a total of six times between April 3 and July 12, 2023 by SBC and Rincon biologists. The surveys covered Periods II, III, IV, and V as outlined in the SWHA protocol. Surveys were initiated prior to Period IV, and those surveys conducted during Period IV we're conducted to monitor known or potential nest sites that had been newly documented or confirmed within the study area during the previous two surveys. Survey dates, times, weather conditions, and names of surveyors are included in Table 1 below.

Surveys were conducted of all previously documented SWHA nests as well as any potential nest trees identified during the literature review or seen in the field. Each survey was conducted by a team of two biologists walking or driving to each potential nest tree. Surveys were conducted during the time periods prescribed in the survey protocol (SWHA TAC 2000) to allow for maximum probability of detection. Surveys were conducted between sunrise to 1000 and 1600 to sunset for Period II; sunrise to 1200 and 1630 to sunset for Period III; and sunrise to 1200 and 1600 to sunset for period V. Surveys conducted during Period IV do not have a set time outlined in the protocol but were conducted from sunrise to 1200 and 1515 to sunset.

Surveys were not conducted during periods of excessive or abnormal heat, wind, fog, rain, or other inclement weather. Surveys were conducted with binoculars and spotting scopes to aid in bird detection. The biologists slowly walked around each tree or group of trees within the survey area or, if the nest was visible from the road, the nest was documented from within the vehicle to avoid disturbing the animal. Notes were taken of each nest discovered and include nest stage (e.g., nest building, egg laying, nestling, fledgling, etc.), number of individuals, life stage (e.g., adult, sub-adult, juvenile, fledgling, nestling, etc.), and behavior (e.g., perching, flying overhead, copulation, brooding, etc.). Care was taken to avoid disturbing active nests during surveys and subsequent nest checks.

Table 1 SWHA Survey Information

Date	Start/End Time	Start/End Temp (F)	Wind Speed (mph)	Weather	Personnel
Period II (March 20 – April 5) and Period III (April 5 – April 20)					
Survey I					
April 3	16:00/20:00	58/55	15-20	Mostly sunny	Stephen Stringer*; Amy Trost
April 4	06:30/10:00 16:00/19:45	35/51 61/50	3-10 10-14	Mostly cloudy	Stephen Stringer*; Amy Trost
April 5	7:00/12:00	35/55	6-9	Mostly cloudy	Stephen Stringer*; Amy Trost
Survey II					
April 11	16:00/20:00	75/65	8-12	Mostly cloudy	Stephen Stringer*; Amy Trost
April 12	06:30/10:00 16:00/20:00	48/57 70/60	8-14 10-15	Mostly cloudy	Stephen Stringer*; Amy Trost

Date	Start/End Time	Start/End Temp (F)	Wind Speed (mph)	Weather	Personnel
April 13	06:30/10:00	50/58	12-16	Partly sunny	Stephen Stringer*; Amy Trost
Survey III					
April 17	06:30/10:00 16:00/20:00	47/61 71/58	0-7 7-10	Mostly cloudy	Stephen Stringer*; Amy Trost
April 18	06:30/10:00	45/56	0-12	Mostly cloudy	Stephen Stringer*; Amy Trost
Period IV (April 21 – June 10)					
Survey IV					
May 1	06:00/10:45 15:15/20:30	49/62 67/52	0-3 1-5	Cloudy	Stephen Stringer*; Amy Trost; Shannon Morris, Morgan Craig
May 2	05:30/10:30 15:15/20:15	51/60 65/54	3-8 1-7	Sprinkled	Stephen Stringer*; Amy Trost; Shannon Morris, Morgan Craig
May 3	06:00/10:15 15:15/19:30	48/60 65/51	1-5 0-3	Sprinkled	Stephen Stringer*; Amy Trost; Shannon Morris, Morgan Craig
May 4	06:30/11:15 13:30/16:00	51/60 62/64	0-4 0-3	Sprinkled	Stephen Stringer*; Amy Trost, Shannon Morris, Morgan Craig
May 9	07:30/16:03	57/70	5-7	Mostly cloudy	Shannon Morris
Period V (June 10 – July 30)					
Survey V					
June 12	15:30/19:30	82/81	7	Cloudy	Stephen Stringer*; Amy Trost; Shannon Morris, Cristy Rice
June 13	06:30/11:00 16:00/20:15	62/76 80/77	3-8 7-8	Cloudy/ muggy	Stephen Stringer*; Amy Trost; Shannon Morris, Cristy Rice
June 14	06:10/10:50 16:00/20:00	62/79 90/87	3-5 7	Partly cloudy	Stephen Stringer*; Amy Trost; Shannon Morris, Cristy Rice
Survey VI					
July 11	16:30/19:30	99/92	1-2	Clear, sunny	Stephen Stringer*; Morgan Craig
July 12	06:00/10:00 16:30/19:45	63/86 102/92	3-5 0-8	Clear, sunny	Stephen Stringer*; Morgan Craig

*Lead biologist

Results

A total of six SWHA nests were documented within the study area during the protocol surveys, hereafter identified as Nests A through F. Five of the nests were located within the Project site and the sixth was located within the 0.5-mile buffer immediately adjacent to the Project boundary (Figure 3). Table 2 provides details of each nest and their disposition. Four (4) of the nests were observed near the top of mature eucalyptus trees, one was observed in a mature cottonwood, and one was observed in a mature elm. Of the six nests documented during the surveys, only three had fledglings during the Period V surveys. It is unclear whether the remaining three nests produced eggs, or successfully fledged, if eggs were produced.

Table 2 SWHA Nest Information

Nest ID	Location (Lat.; Long.)	Date SWHA First Observed	Final Disposition	Notes
Nest A	36.475744°N; 120.248592°W	4/12/23	Fledgling	4/12/23 – Two adult SWHA flushed from nest tree. 5/4/23 – One adult SWHA observed in nest and one perched nearby in nest tree. 6/12/23 – Adult SWHA observed in nest, stage unknown. 7/12/23 – Fledgling SWHA observed in nest.
Nest B	36.443796°N; 120.229731°W	4/13/23	Unknown	4/13/23 - Adult SWHA observed on nest. Second adult observed foraging nearby. 6/13/23 – Adult female SWHA observed on nest, potentially brooding. Second adult believed to be the male observed nearby. 7/12/23 – Adult SWHA observed on nest, no fledglings observed. Nest stage/success unknown.
Nest C	36.471403°N; 120.221042°W	4/17/23	Fledgling	4/17/23 – Unoccupied nest observed in tree. A pair of SWHA observed in the vicinity. 5/1/23 – Adult SWHA observed at nest. 6/13/23 – Adult female on nest believed to be incubating eggs or potentially with hatchlings. 7/12/23 – Fledgling observed in nest.
Nest D	36.455497°N; 120.212220°W	5/1/23	Fledgling	5/1/23 – SWHA pair observed copulating in vicinity of nest, subadult observed nearby. 6/12/23 – Adult SWHA observed in nest, nest stage could not be determined. 7/12/23 – Fledgling SWHA observed in nest, two adults guarding nest.
Nest E	36.504291°N; 120.205612°W	5/9/23	Unknown	5/9/23 - Adult SWHA observed in nest. 6/12/23 – Adult female SWHA observed sitting low in the nest, believed to be incubating eggs. 7/12/23 – No SWHA observed during final survey, final disposition unknown.
Nest F	36.465570°N; 120.221436°W	7/12/23	Unknown	7/12/23 – SWHA pair observed guarding nest. Nest status unknown. No fledglings observed. Nest was not observed during prior surveys.

Rincon observed nests of several other raptor species within the study area during the surveys, including six (6) great horned owl (*Bubo virginianus*) nests, five (5) red-tailed hawk (*Buteo jamaicensis*) nests, and eleven (11) inactive large sticks nests. Other raptors encountered while surveying include American kestrel (*Falco sparverius*), northern harrier (*Circus hudsonius*), and barn owl (*Tyto alba*).

Discussion

A total of six surveys were conducted between April 3, 2023 and July 12, 2023 by SBC and Rincon biologists. Over the course of the surveys conducted during the six survey windows, Rincon documented a total of six active SWHA nests within the study area. Three active nests were first observed during the April surveys (Surveys II and III). Two additional active nests were first observed during the May survey (Survey IV), and the final active nest was first observed during the July survey (Survey VI). Five (5) nests (all but Nest E) were documented to have typical nesting behaviors during at least one survey, indicating breeding had potentially resulted in eggs. However, only three of the

nests (Nests A, C and D) were documented with fledglings during the final survey. Nest E was first observed in the July survey window and no evidence of actual nesting behavior was observed.

Swainson's hawks have an incubation period of 34-35 days and a nestling period of 17-22 days (USFWS ECOS). Based on these breeding periods and the timing and observations of our surveys, we can conclude that Nests B and E could have successfully fledged young prior to our final survey. At the time of the June survey (Survey V) an adult was observed low in Nest E, a posture associated with incubating eggs. Twenty-nine days passed between Survey V and Survey VI, during which time the eggs being incubated could reasonably have hatched and the young fledged. Similarly, the adult in Nest B appeared to have been in a brooding posture indicating it had young chicks at the time of Survey V. At the time of Survey VI the adult was observed on the nest but no fledglings were observed nearby. The chicks could reasonably have fledged during this time period.

The final disposition of Nest F could not be determined as it was discovered during Survey VI, no chicks were observed, and the adult was not displaying any specific behaviors that would have given insight to the nest's status (i.e., incubating or brooding posture, food carry, etc.). This nest could have had young chicks that were not visible from the ground but the biologists were unable to definitively determine the nest's status.

Sincerely,
Rincon Consultants, Inc.

Amy Leigh Trost
Biologist, Rincon Consultants

Stephen Stringer, M.S.
Principal Biologist, SBC

David Daitch, Ph.D.
Vice President, Rincon Consultants

Attachments

Figure 1 Project Vicinity
Figure 2 Project Location
Figure 3 Swainson's Hawk Survey Area and Results

References

California Department of Fish and Wildlife (CDFW). 2023. California Natural Diversity Database, Rarefind V. Accessed March 2023.

iNaturalist. 2023. Available from https://www.inaturalist.org. Accessed March 2023.

Estep, J. 2016. The Distribution and Abundance of Nesting Swainson's Hawks in the Vicinity of the Proposed RE Scarlet Solar Generation Facility. Prepared for RE Scarlet LLC. September.

_____. 2011. The distribution and abundance of nesting Swainson's hawks in the vicinity of the proposed RE Tranquillity LLC solar generating facility. Prepared by Estep Environmental Consulting, Sacramento, CA, for RE Tranquillity LLC, San Francisco, CA. November.

Estep, J.A. and J.L. Dinsdale. 2012. Distribution, abundance, and habitat associations of nesting Swainson's hawks in the central San Joaquin Valley, California. CVBC Bulletin, 15(4): 84-106.

Swainson's Hawk Technical Advisory Committee (SWHA TAC). 2000. Recommended Timing And Methodology For Swainson's Hawk Nesting Surveys In California's Central Valley. May 31, 2000.

United States Fish and Wildlife Service (USFWS). 2023. Environmental Conservation Online System, Swainson's Hawk (*Buteo swainsoni*). Accessed October, 2023.

Figure 1 Project Vicinity

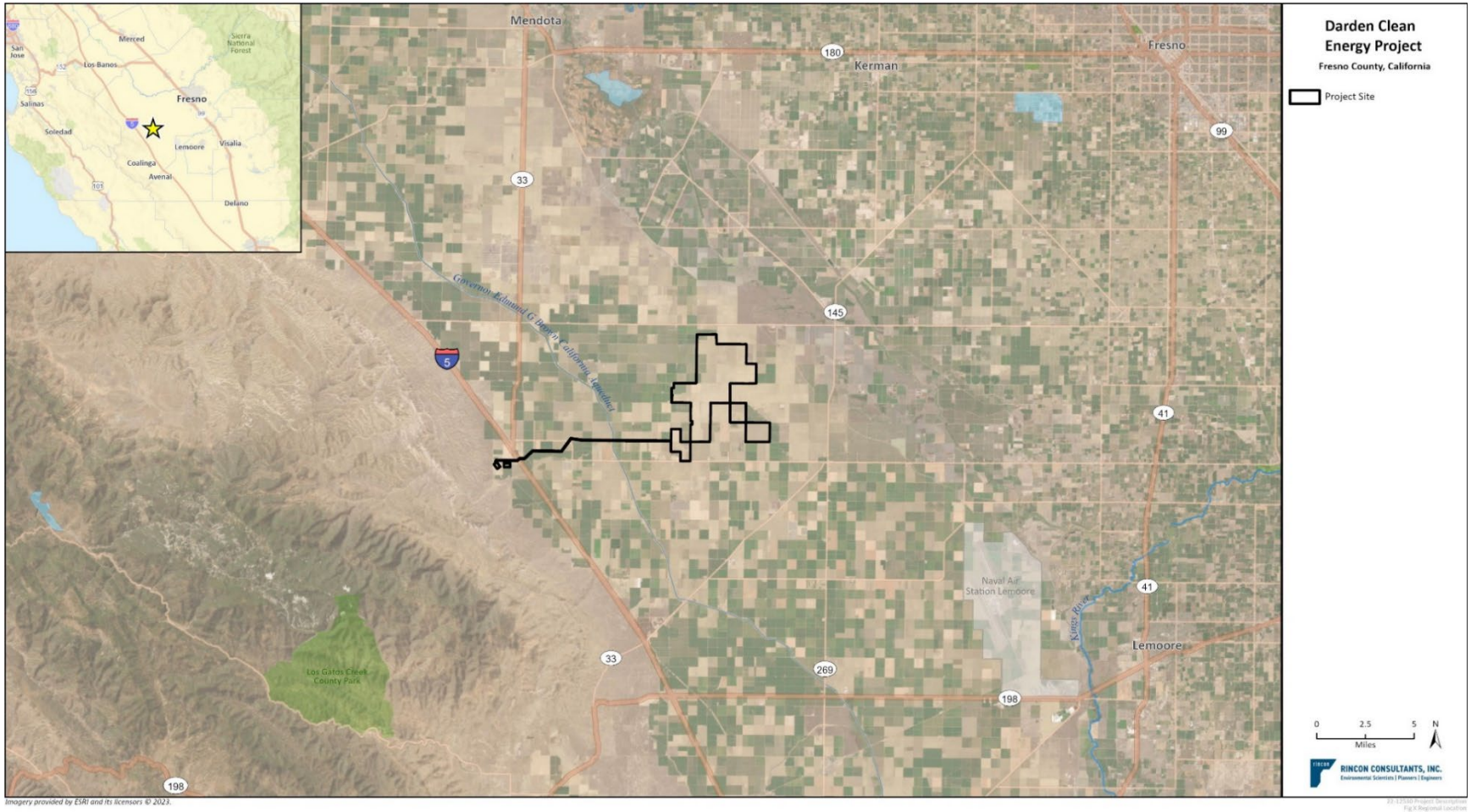


Figure 2 Project Location

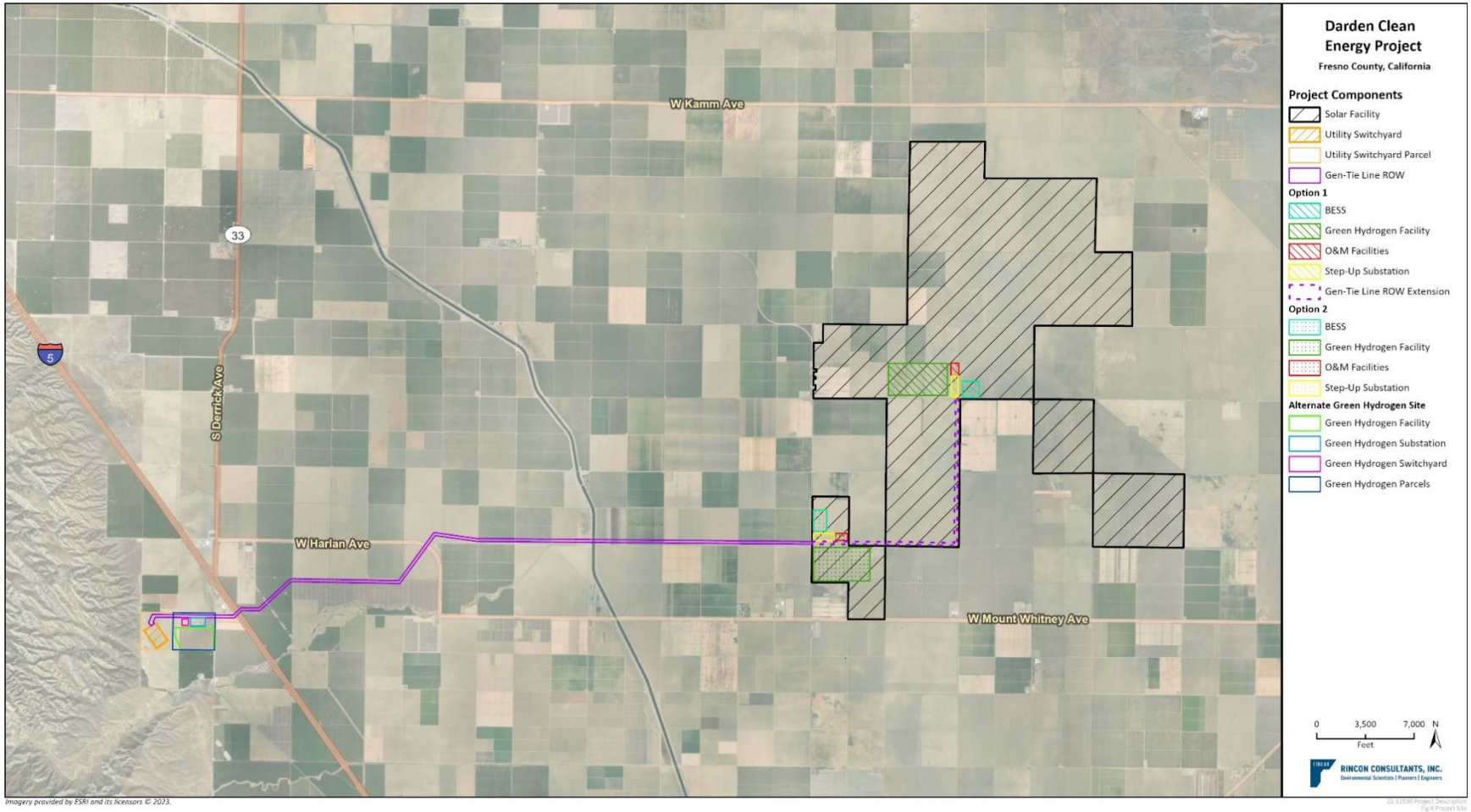
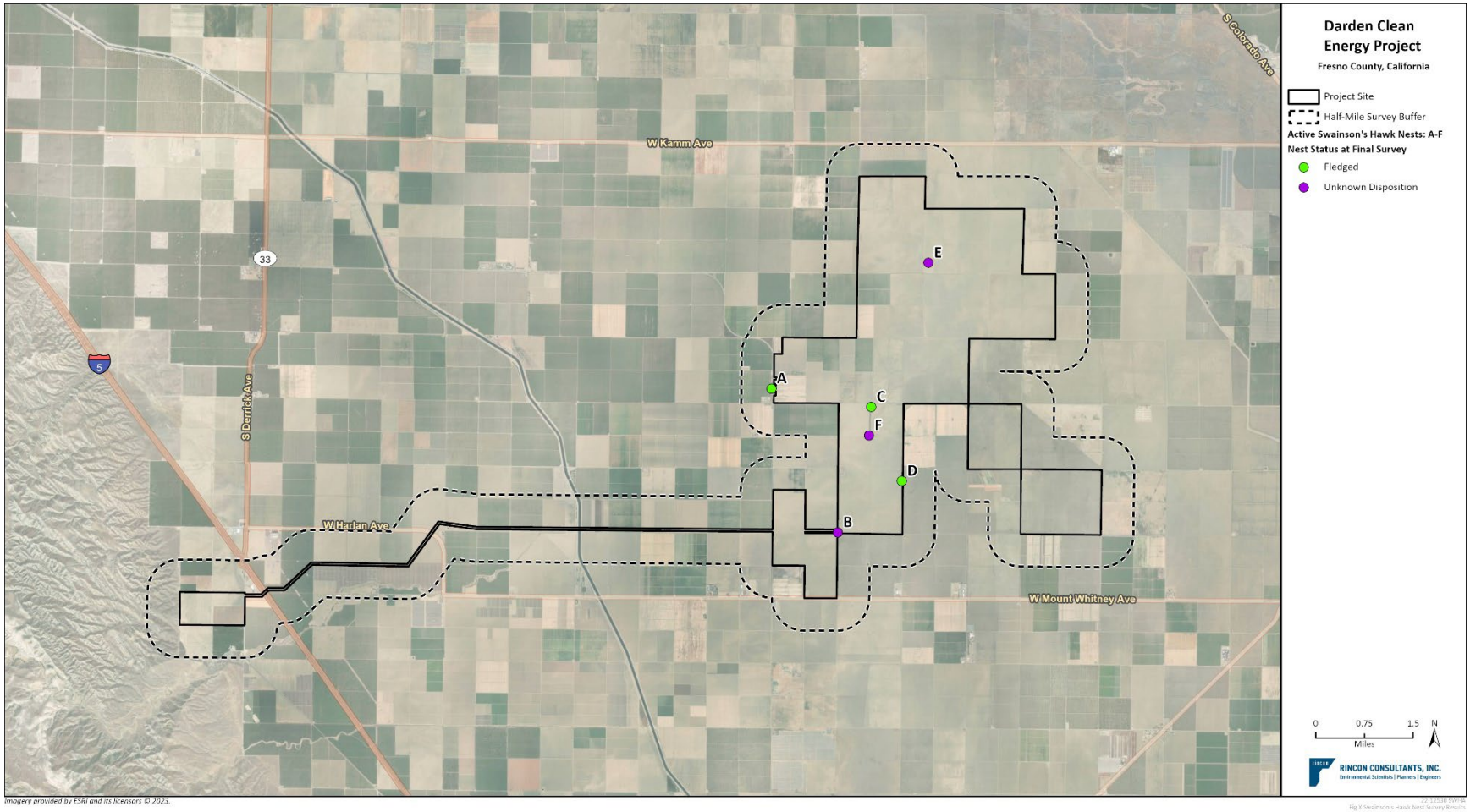


Figure 3 Swainson's Hawk Survey Area and Results



Appendix Q-8

Analysis of Project Impacts to Swainson's Hawk Foraging Habitat

Darden Clean Energy Project

SWHA Foraging Study

prepared for

IP Darden I, LLC and Affiliates
a subsidiary of Intersect Power, LLC
9450 SW Gemini Drive PMB #68743
Beaverton, Oregon 97008

prepared by

Stringer Biological Consulting, Inc.
3493 Ridgeview Drive
El Dorado Hills, California 95762

October 2023

TABLE OF CONTENTS

Tables

Attachments

1 EXECUTIVE SUMMARY

Stringer Biological Consulting, Inc. (SBC) in coordination with Rincon Consultants, Inc. (Rincon) conducted an analysis of the potential impacts of the proposed Darden Clean Energy Project (project) on foraging habitat for Swainson's hawk (SWHA; *Buteo swainsoni*) on behalf of IP Darden I LLC. The purpose of this report is to provide the Lead Agency with information necessary to make findings pursuant to the requirements of the California Environmental Quality Act (CEQA). This report evaluates potential project impacts to SWHA resulting from a temporary loss of foraging habitat during the construction phase of the project and prior to site restoration.

Based on the results of the analysis presented herein, the proposed Darden Clean Energy Project would not result in a significant impact to the regional population of SWHA through loss of suitable foraging habitat at the project level, nor would it contribute to a significant cumulative impact in concert with other planned or reasonably foreseeable solar projects within the 10-mile radius study area. The loss of 4,818 acres of agricultural land will not affect the distribution or abundance of nesting SWHAs in the study area. Because it represents only 2.3% of the available foraging habitat within the study area, its conversion is negligible relative to availability, and particularly with regard to the relatively small number of SWHAs that nest in the study area. The loss of 4,818 acres of agricultural land would not represent a significant loss of foraging habitat for SWHAs and does not represent a significant CEQA impact. At the cumulative level considering other solar projects in the study area in addition to the Darden Clean Energy Project, all planned, or reasonably foreseeable solar projects represent approximately 4.5% of the total available foraging habitat within the study area which leaves significantly more foraging habitat than is needed by the regional population.

In conclusion, the proposed project would not result in a significant reduction (based on the significance threshold and assessment methods used in this report) of available SWHA foraging habitat at either the project or cumulative level, and that as a result of this analysis no mitigation should be required as per CEQA guidance.

2 INTRODUCTION

Stringer Biological Consulting, Inc. (SBC) in coordination with Rincon Consultants, Inc. (Rincon) has prepared this letter report on behalf of IP Darden I LLC, to present an analysis of the potential impacts of the proposed Darden Clean Energy Project (project) on foraging habitat for Swainson's hawk (SWHA; *Buteo swainsoni*). SWHA is listed as threatened under the California Endangered Species Act (CESA). The purpose of this report is to provide the Lead Agency with information necessary to make findings pursuant to the requirements of the California Environmental Quality Act (CEQA).

The analysis provided in this letter report was undertaken to evaluate potential project impacts to SWHA resulting from a temporary loss of foraging habitat during the construction phase of the project and prior to site restoration. The study design is based on an approach that has previously been used in Fresno and Kings Counties (Estep 2011, 2016; HELIX 2018a; HELIX 2020) to support CEQA determinations. The methodological approach combines field observations, public and proprietary data, and a desktop spatial analysis to estimate the acreage of suitable foraging habitat required to sustain the regional population of SWHA, as well as the amount of suitable foraging habitat available. Impacts to foraging habitat are assessed at both the project and cumulative levels to determine whether the reduction in foraging habitat as a result of the project and other planned or reasonably foreseeable projects would result in a significant impact to SWHA and necessitate off-site or on-site mitigation to reduce impacts.

Project Location and Description

The project site is located in the vicinity of the Interstate 5/State Route 33/State Route 145 intersection, northwest of the City of Huron in unincorporated Fresno County. The project site is located within the "San Joaquin, CA" and "Westside, CA" U.S. Geological Survey 7.5-minute topographic quadrangles. The project site centroid is located at approximately latitude 36°29'10.54"N, and longitude 120°12'32.00"W. Figure 1 in Attachment A is a Regional Location and Vicinity Map. All report figures are in Attachment A.

The project includes approximately 9,120 acres for development of photovoltaic (PV) solar arrays located on Westlands Water District lands. As part of the land transfer to the Applicant, Westlands Water District would subject this land to a non-irrigation covenant, meaning the land would be restricted from current and future irrigated agricultural use. The project's associated infrastructure includes battery storage, generation tie lines and a substation, and may include a green hydrogen component. The project's step up substation and battery energy storage system (BESS) will be located within the PV solar development area. The green hydrogen facility may be co-located with the substation and or located at an alternative site west of Interstate 5. The gen-tie line will be approximately 10-15 miles.

Solar PV generating facilities consist of individual solar panels (modules) which are arranged in rows to form solar arrays. The arrays are combined to form larger units called solar blocks or array blocks. For large-scale utility applications, hundreds of array blocks are interconnected as part of the solar power generation facility. Each array block is served by an electrical inverter, which can be located centrally within the array block or distributed within the array footprint. The inverters convert the direct current (DC) output from the array to alternating current (AC) which is then conveyed to the substation and switchyard which steps up the voltage to match the collection system.

Site History

The proposed project is located primarily on lands owned by Westlands Water District (Westlands). Westlands acquired this property as part of the September 3, 2002, settlement agreement reached among the United States, Westlands, and others in the Sumner Peck Ranch et al. v. Bureau of Reclamation et al. lawsuit. The project site is located in an area of agricultural land use and has historically been used for dry-farmed (non-irrigated) agriculture, such as low-yield production of winter wheat and oats, and has been used for this purpose for the last 10 years. Currently, some portions of the project site lie fallow while the majority of the area is used to grow non-native grasses and forbs, such as mustard and alfalfa. The project parcels fall within portions of Westlands' lands that are under various and intensive constraints to irrigation resulting from multiple lawsuits and settlements over the past two decades. As a result, and for all intents and purposes, these lands can no longer support crop-agriculture activity.

Summary of the Proposed Project

Impact Area

For the purposes of this analysis, the entire project site is considered suitable foraging habitat for SWHA. Historically these lands have functioned as moderate to high-quality foraging habitat for the species because they have been under agricultural crop use for many decades. However, the current status of Westlands Water District lands, as described above, indicate the suitability for foraging would be potentially degraded in coming decades, as, without a rigorous management regime, they would remain either barren disked fields or be heavily impacted by invasive weeds such as mustard and Russian thistle. We suggest the cessation of agricultural activity should be a contributing factor in any assessment of potential impacts to foraging habitat.

The solar array blocks (PV modules), in combination with the BESS, substation and green hydrogen facility, would cover an estimated maximum of 4,818 acres. This is based on the specific panel size and layout of the PV development areas wherein, for each 7.5-foot-wide panel rack (when panels are in their horizonal position) there is a corresponding open row between racks that measures 10.5 feet wide. This amounts to a panel coverage of approximately 42% within PV development footprints. Preliminary engineering assessments have determined percent cover could be as high as 48% at horizontal, and therefore, calculations have assumed 48% as the worst-case scenario. When calculated against a total of 9,120 acres of PV development area, this amounts to 4,378 acres of panel cover at horizontal (peak cover) position. Combined with other project infrastructure, we estimate a total impact of 4,818 acres of SWHA foraging habitat (Table 1). While an estimated maximum of 4,818 acres out of the total project area of approximately 9,510 acres would be covered at a maximum (when PV modules are fully horizontal) during operations, we have also assessed impacts to foraging habitat in the context of the temporary, construction-phase impacts of all 9,510 acres, assuming the worst-case scenario that it would all be unavailable for foraging during the construction period.

Table 1. Project Impacts (acres)

Project Feature	Temporary Construction Impacts (acres)	Permanent Forage Cover (C)/Loss (L) (acres)
Total PV Development Footprint	9,120	-
PV panel cover at horizontal	-	4,378 (C)
O&M structures (Option 1:Option 2)*	11:10	11 (L)
Green Hydrogen Facility and Step-Up Substation (Options 1 and Options 2)*	242	242 (L)
Alt Green Hydrogen Switchyard and Substation (if required)	120	120 (L)
Utility Substation	35	35 (L)
Battery Storage (BESS) (Option 1 and Option 2)*	32	32 (L)
Gen-tie Corridor (gen-tie extension*)	235 (96)	0
Maximum Total Impacts	9,510	4,818

*Means the component overlaps the PV Development Footprint

Swainson's Hawk Use of the Project Site

Surveys for nesting SWHA were conducted at the proposed project site by SBC and Rincon biologists between April and July 2023. SWHA surveys were conducted within the entire project site as well as a 0.5-mile buffer around the project site. The surveys were conducted in accordance with the guidelines prepared by the SWHA Technical Advisory Committee (SHTAC) in the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (SHTAC 2000). The project site was surveyed a total of six times during survey Periods II, III, IV, and V. The SWHA surveys consisted of three surveys in Period II/III on April 3-5, April 11-13, and April 17-18; one survey in Period IV on May 1-3; and two surveys in Period V on June 12-14 and July 11-12. Surveys were only conducted during Period IV because three prior surveys had been conducted and all known SWHA nests sites had been documented. Surveys in Period IV generally consisted of checking known SWHA nests to document status (active or inactive) and searching for nests of other raptors. A total of five active SWHA nests were documented within the project site during the surveys and one additional active SWHA nest was documented just outside of the project site within the 0.5-mile buffer (See Figures 2 and 3).

3 METHODS

Swainson's Hawk

SWHA was state listed as a California threatened species on April 17, 1983, and has no federal listing status. The species is a breeding resident and migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and the Mojave Desert. There has been very limited SWHA breeding reported from Lanfair Valley, Owens Valley, Fish Lake Valley, Antelope Valley, and in eastern San Luis Obispo County. SWHA breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley and forages in adjacent grasslands or suitable grain or alfalfa fields, or livestock pastures. SWHAs breed in California and winter in Argentina, Mexico, and South America. SWHAs usually arrive in the Central Valley between March 1 and April 1 and migrate south between September and October. SWHAs typically nest in trees adjacent to suitable foraging habitat, with nest trees generally located near the edges of riparian stands, and adjacent to, or among agricultural fields, as well as in mature roadside trees. Central Valley SWHAs typically build or reuse nests in large trees, such as valley oak (*Quercus lobata*), Fremont's cottonwood (*Populus fremontii*), willow (*Salix* spp.), walnut (*Juglans hindsii* x *regia*), western sycamore (*Platanus racemosa*), Eucalyptus (*Eucalyptus* spp.), and ornamental redwoods (*Sequoia sempervirens*) and pines (*Pinus* spp.) (Clark Jr. and Biddy et. al. 2022). Suitable foraging areas for SWHA include native grasslands or lightly grazed pastures, alfalfa and other hay crops, idle land, certain grain and row croplands, and ruderal lands. SWHAs primarily feed on voles; however, they will feed on a variety of prey including other small mammals, birds, snakes and insects.

Regulatory Guidance

The California Department of Fish and Wildlife (CDFW) has developed regional strategies to address land use issues related to SWHA conservation pursuant to both the California Endangered Species Act (CESA) and the CEQA process. The CDFW Region 2 guidelines (CDFW 1994) are often used during CEQA review of proposed projects in the Central Valley. Amongst other recommendations, the guidelines recommend acquisition of replacement lands (i.e., compensatory mitigation) for projects that would result in the loss of foraging habitat acreage sufficient to be considered a significant impact to the SWHA population pursuant to CEQA definitions. The guidelines state that the determining criteria for CEQA significance is removal of any suitable foraging habitat within 10 miles of an active SWHA nest, which is defined as a nest active at any time in the previous 5 years. The recommendations contained in the guidelines do not account for the size of the affected population, the amount and quality of existing foraging habitat, or the size of the project relative to the amount of available foraging habitat; however, the guidelines do allow for independent assessment of impacts and development of a conservation strategy as an alternative to the guidelines.

To specifically assess the potential impacts of the proposed project to SWHA, this study quantified the effects of the proposed project on the regional population of SWHA by analyzing data on land use, nest distribution and SWHA abundance within 10 miles of the project. The results of this study are designed to inform a CEQA significance determination based on project-specific information regarding SWHA population data and regionally available foraging habitat.

Methodology

Impacts to SWHA Foraging

This analysis follows methods used for several other utility-scale solar projects approved in the region (reviewed in Estep 2017), including similar projects in Fresno County (Estep 2011, 2016, HELIX 2020). In order to provide a more robust assessment of CEQA impacts, the scale of the analysis goes beyond the project site and the nearest active SWHA nest, and in this way differs from the standard CDFW Guidelines. The analysis considers the size and distribution of the regional population of SWHA, the availability of suitable foraging habitat, and the effect of project development on the availability of SWHA forage resources to the regional population (i.e., suitable foraging habitat).

Regional Population and Study Area

For purposes of this analysis, the regional population of SWHA was defined as the number of nesting territories documented within 10 miles of the project site. The 10-mile radius standard was chosen based on telemetry studies that indicate SWHA will fly up to 10 miles from the nest to forage (Babcock 1995, Estep 1989). Consequently, the regional population for the study is equivalent to the SWHA that may potentially forage on the project site and thus be directly affected by the project through loss of foraging habitat. The 10-mile radius around the project site boundary (smoothed to account for the uneven shape of the project site) defines the study area for the analysis (depicted on Figure 2). The gen-tie route provides limited foraging habitat for SWHA and impacts along the gen-tie route (i.e., power poles) would be negligible as they relate to any loss of SWHA foraging habitat. While the gen-tie route is encompassed within the 10-mile radius study area, it was not included in project limits that were used to define the study area.

Foraging Habitat Availability

The amount, distribution, and quality of foraging habitat available to the regional population is a function of surrounding land use patterns. Historically, SWHA hunted in the grasslands of the Central Valley and coastal valleys, and the desert scrub and shrub lands of high desert regions. With the conversion of the Central Valley to agriculture, SWHA foraging has shifted to managed cultivated lands and the availability of foraging habitat has become largely dependent on agricultural practices (Babcock 1995, Woodbridge 1991, Estep 1989). The suitability of individual land cover types is largely a function of two factors: 1) prey abundance; and 2) prey accessibility; the latter of which is influenced by vegetation structure (Estep 2009, Bechard 1982). Land uses considered suitable for SWHA foraging include alfalfa hay; irrigated cropland typically cultivated in a rotation of cotton, wheat, and tomatoes, but also including silage crops such as triticale, sorghum, and corn; irrigated pasture; and uncultivated land that has retained some natural soil and vegetation (Estep 2017). Agricultural land uses historically considered unsuitable for SWHA foraging include orchards and vineyards (Estep 2017).

The results of a two-year study of four to five (second year only) solar array fields in Sacramento County demonstrated that SWHA do forage in moderately-sized solar array fields following conversion from cultivated uses. SWHA use of solar array fields exceeded expected use based on availability within the agricultural landscape (Estep 2021). The study evaluated solar arrays that were managed to function as suitable SWHA foraging habitat (i.e., low cover of grasses maintained at 4 to 12 inches in height) and were located within a matrix of agricultural land that included irrigated pasture, dry pasture, and irrigated cropland. The study suggests that properly managed solar array fields within an agricultural landscape are not avoided by SWHA and may be selected at a greater frequency than many cultivated

land cover types (Estep 2021). Other studies have also shown that SWHA will forage in utility-scale solar generating facilities that are located within an overall matrix of agricultural land (HELIX 2018a).

Suitable foraging habitat varies in quality based on agricultural management of various crop types. Crop types that support large numbers of rodent prey and consistently have a low, open vegetation structure provide the highest quality habitat, whereas crop types that support low numbers of prey or are characterized by tall and dense vegetation provide the lowest quality foraging habitat. Foraging studies indicate that SWHA preferentially forage in alfalfa, tomato, wheat, oat, and other annually rotated crops that maintain a relatively low vegetation profile and that are harvested during the breeding season. Alfalfa has been shown to provide particularly high value habitat due to its consistently low vegetation height and high frequency of mowing and is used by SWHA at a significantly higher rate relative to its availability in the landscape (Estep 2013, 2009, 1989; Swolgaard et al. 2008; Babcock 1995; Bechard 1982). Other grain crops (e.g., wheat, barley, sorghum), along with row crops (e.g., tomatoes, sugar beets) and irrigated pasture provide moderate value habitat, as they are harvested during the breeding season. Crops such as corn, cotton, safflower, melons, and vegetables provide low value foraging habitat (Estep 2015). Based on the documented parameters of SWHA forage preference, we have categorized available landscape-scale data on land use for foraging suitability as follows: suitable or unsuitable for SWHA foraging, and where suitable, as Low, Moderate, or High quality foraging habitat.

Foraging Habitat Requirements

SWHA forage widely over large areas (Estep 2015). Data from two telemetry studies conducted in the Sacramento Valley indicate that SWHA home ranges vary from 830 acres to 21,543 acres (Estep 1989, Babcock 1995). The average home range size from Babcock (1995) was 9,978 acres (N=5) and from Estep (1989) was 6,820 acres (N=12). Smaller home ranges generally correlate with high percentages of alfalfa, fallow fields, and dry pastures within the range (Babcock 1995, Woodbridge 1991, Estep 1989). In the immediate vicinity of high value foraging habitat, home range sizes are as low as 830 acres (Estep 2015). The analyses in this study were based on an average home range size of 6,820 acres (Estep 1989), as it represents a reasonable estimate of home range size given the land use and crops in the region, as supported by field research.

Home range and foraging territory are not synonymous. The 6,820-acre home range is the average area that an individual hawk will occupy during the course of the breeding season; however, within this area, foraging occurs opportunistically where conditions provide accessible prey (Estep 2015). Furthermore, this area is not defended and SWHA often forage communally (Estep 1989, personal observations by the author). Although average home range size may not be an accurate indicator of realized foraging habitat acreage, it is not feasible to precisely quantify the foraging area used by individuals of wide-ranging, opportunistic species such as SWHA; therefore, the average home range size is a useful baseline that can be adjusted to account for factors that affect the amount of the home range that provides the essential resource base for the SWHA nesting territory and thus determines the amount of habitat required to sustain a nesting pair (Estep 2015).

Factors that affect the amount of the home range that provides the essential resource base for the SWHA nesting territory include 1) Home range overlap; 2) Habitat suitability; and 3) Foraging outside a study area. Each of these factors is described in detail below.

Factor One – Home range overlap. Home ranges within a population overlap, as SWHA forage opportunistically over a shared landscape and often gather in large numbers to forage during agricultural activities that expose prey such as harvest, disking, burning, or flooding. Estep (1989) found that average overlap among home ranges within a population was 40 percent. Adjusting the average home range size downward by the average amount of overlap partially accounts for the extent to which SWHA in a population share the available foraging habitat in the region.

Factor Two – Habitat suitability. While SWHA utilize a large home range, actual foraging takes place in a subset of the total home range, and most prey capture attempts are in moderate- or high-quality habitat areas (Estep 2015). Most SWHA home ranges are likely to contain some unsuitable and low-quality suitable land uses that do not contribute appreciably to the resource base available in the home range. In order to account for this, the average home range can be adjusted downward to reflect only the proportion of the suitable foraging habitat in the study area that is of Moderate or High quality (Estep 2015).

Factor Three – Foraging outside the study area. Because SWHA utilize land up to 10 miles from the nest for foraging, some portion of the calculated potential foraging habitat available to a nesting pair in the regional population will be outside the study area, unless the nest is inside the project site boundary. Comparing only the habitat available inside the study area to the total habitat requirements of the regional population would substantially underestimate the amount of habitat available to the regional population. The amount of overlap between the study area and the potential foraging territory of a nest will decrease with distance from the project site. This relationship can be represented in a simplified manner with Equation 1, which is a trigonometric formula for the overlap (A) between two circles of unit radius (radius=1):

$$A = 2\,cos^{-1}\left(\frac{d}{2}\right) - \frac{d}{2}\sqrt{4 - d^2}$$

where d=distance between the centers of the circles expressed as a proportion of the radius, and r=1. This is a suitable approximation of the amount of a given nest's potential foraging area within the Study Area as a function of its distance from the project site, as the study area is approximately a circle of radius 10 miles centered on the project site, and the potential foraging area available to a nesting pair of SWHA is approximately a circle of radius 10 miles centered on the nest. The measure of overlap (A) for each pair of nests is used to calculate the weighted average overlap between the study area and the potential foraging area available to the regional population (r).

After applying this equation to each nest location in the regional population and calculating the weighted average overlap of all nests, the total amount of foraging habitat required by the regional population can be adjusted to reflect the average proportion of all home ranges that is outside the study area. For this analysis, nest distances from the project site were binned in increments of 1 mile, and the value of d for each bin was the mid-point of the distance increment (e.g., all nests between 2 and 3 miles from the project site boundary were given a value of 2.5). As an example of the process, for a nest that is between 2 and 3 miles from the center of the project site, the quantity d is calculated as 2.5 miles divided by the 10-mile radius of the circle and equals 0.25.

Using all of the information discussed above, the acreage of suitable foraging habitat required in the study area to support the regional population of SWHA (Y) can be calculated using Equation 2:

$$Y = n \cdot 6{,}820 \cdot p \cdot q \cdot r$$

where n is the number of SWHA nesting pairs in the regional population; 6,820 is the baseline average home range size; p is the adjustment for average home range overlap (1-average overlap); q is the proportion of the suitable habitat in the study area that is moderate- or high-quality habitat; and r is the weighted average overlap between the study area and the potential foraging area available to the regional population. The quantity Y can be subtracted from the total existing acreage of suitable foraging habitat in the study area; a positive result would indicate that there is a surplus of foraging habitat available to SWHA in the study area; a negative result would indicate that there is a deficit of foraging habitat in the study area.

Thresholds of Significance

CEQA defines the significance of an impact on a state-listed species based on the following relevant thresholds of significance:

- Appendix G of the State CEQA guidelines states that a biological resource impact is considered significant (before considering offsetting mitigation measures) if the lead agency determines that project implementation would result in "substantial adverse effects, either directly or through habitat modifications, on any species identified as being a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS"; and
- CEQA Section 15065 (Mandatory Findings of Significance) states that a biological resource impact is considered significant if the project has the potential to "substantially reduce the number or restrict the range of an endangered, rare or threatened species".
- Both these thresholds are understood to mean something other than "take" of a single member of a species.

Impacts to SWHA Foraging

Based on the above-referenced definitions, the proposed project could be considered to have a potentially significant impact to SWHA if it resulted in a reduction of available foraging habitat below the amount required to sustain the regional population. If the proposed project would not result in a deficit of suitable foraging habitat in the study area, the project's impact on foraging habitat could be considered less than significant under CEQA.

Because SWHA home ranges are different each year due to seasonal and annual changes in the crop matrix, it is difficult to predict or model the extent of the area likely to be used by a given pair of SWHA over a period of years (Estep 2015). The method herein used to estimate the acreage of available and required foraging habitat in the study area is robust and scientifically defensible; however, the approach is dependent on several generalizations and assumptions, and the resulting estimates for some of the model's inputs are best approximations. To account for variation in the estimated inputs (due to such factors as interannual variation in the regional population caused by mortality and recruitment), to allow for resilience in the population to environmental factors outside the scope of this analysis, and to account for other potential sources of error, the CEQA significance threshold has been set substantially higher than the minimum amount of foraging habitat required in the study area to sustain the regional population. For this analysis, the CEQA significance threshold was conservatively set at 70 percent of the existing surplus habitat. If the project would result in the surplus of suitable foraging habitat in the study area being reduced to less than 70 percent of the existing surplus, the project would be considered to

have a significant impact on the regional population of SWHA under CEQA. This 70% threshold was established by Estep (2015) as being adequate to provide a buffer of foraging habitat above the minimum number of acres needed and has been accepted by numerous CEQA lead agencies.

Data Acquisition and Processing

Data used in the analysis came from publicly available datasets, the results of other SWHA nest surveys conducted in the region, and data obtained during surveys performed by SBC and Rincon in 2023.

Land Use Data

Land use data were taken from the California Department of Water Resources (DWR) 2019 Crop Mapping dataset: https://data.cnra.ca.gov/dataset/statewide-crop-mapping. The data are based on the 2019 Statewide Agricultural Survey conducted by DWR and were downloaded on December 5, 2022. This dataset contains agricultural land cover vector data covering the entire Study Area, which is derived from land cover data collected by DWR personnel based on aerial imagery and ground surveys. The data were clipped to the Study Area boundary and cross-checked for accuracy by SBC staff using aerial imagery available in desktop Google Earth Pro applications as well as 2021 land cover raster data obtained from the U.S. Department of Agriculture (USDA) Crop Layer available online at https://www.nass.usda.gov/Research_and_Science/Cropland/Release/index.php. Where conflicts arose between agricultural land cover classifications in the DWR 2019 vector data and more recent aerial imagery available in Google Earth Pro or the USDA 2021 raster dataset, the land cover type was modified to reflect the more recent aerial imagery/data. Land cover for non-agricultural areas was classified using desktop Google Earth Pro applications and the USDA 2021 raster data, which classifies all land cover in the Study Area including undeveloped and urban areas, and acreages were obtained using ArcMap 10.7.1® applications. Once all land in the Study Area was assigned a land cover classification, each land cover type was characterized as suitable or unsuitable for SWHA foraging, and as High, Moderate, Low, or Unsuitable quality foraging habitat, according to a crosswalk derived from previous studies (Estep 2015, 2017). The crosswalk is provided in Attachment B.

Swainson's Hawk Nest Data

Spatially explicit data on SWHA sightings and previously documented SWHA nest locations in the study area were obtained from the following sources: iNaturalist (https://www.inaturalist.org), a comprehensive ground survey performed in 2011 for the Tranquillity Solar project (located in the northwest corner of the study area) for all SWHA nesting pairs within a 10-mile radius of the Tranquillity Solar project site (Estep 2011), a comprehensive ground survey of SWHA nests in the central San Joaquin Valley that includes the study area (Estep and Dinsdale 2012), a comprehensive ground survey performed in 2016 for the Scarlet Solar project (located in the northwest corner of the study area) that included a survey for all SWHA nesting pairs within a 10-mile radius of the Scarlet Solar project site (Estep 2016a), California Natural Diversity Database (CNDDB) records, and data from other unpublished SWHA surveys conducted in the Study Area over the last 6-7 years by SBC staff.

Based on a review of the available historic nest data described above, a predicted 40 (with a margin of error of ± 2 or 3) SWHA nests/nest territories would be expected to be present in the study area. The exact number of SWHA nest territories previously documented is impossible to determine as it is derived from a compilation of data from multiple studies conducted over several years and likely contains duplicative nest accounts. Some trees with previously documented nests have been removed

or have experienced branch or trunk failure causing the pair to relocate, potentially resulting in double counting of a nesting pair in the desktop review. Some of the historic nest records appear to be duplicates because they are from different studies conducted in different years and some of the pairs would be expected to have moved nest territories over the life span of the various studies. All of these factors could potentially affect the estimate of the actual SWHA nest territories present in the study area based on historic data.

SWHA Nest Surveys

Prior to initiating ground surveys, a desktop review was conducted to compile data on all previously documented SWHA nests in the study area (described above in *Swainson's Hawk Nest Data*) as well as identify potentially suitable nesting locations for SWHA within the study area. To identify suitable nest trees, the entire Study Area was divided into grids using ArcMap 10.7.1®, which were exported into the Google Earth Pro desktop application. Using the grid system exported into Google Earth Pro, SBC staff systematically reviewed the most recent available aerial imagery and street view photography (where available) and created a kmz file of all potentially suitable nest trees in the Study Area as a general guidance to inform the field surveys. Trees were generally classified as suitable or unsuitable based on size, crown density and location (e.g., horticultural trees in the interior of urban areas such as the communities of San Joaquin or Tranquillity and very small dense trees were generally considered unsuitable). In cases where the potential suitability of the tree was questionable (e.g., it appeared to be small with a dense crown on aerial imagery but was located adjacent to medium to high quality foraging habitat), it was designated as a potentially suitable nest tree. Regardless of the desktop identification and classification of suitable nest trees, any potentially suitable nest tree identified during field surveys was searched for SWHA nests.

The entire study area, including the project site and 10-mile radius, was surveyed twice in spring/summer of 2023 during the SWHA nesting season. The surveys were designed to be a complete census of nesting SWHA in the study area. Following methodology designed by Estep (reviewed in Estep 2017), surveys were conducted in two main phases, during the late brooding/early nestling phase (April 20 to May 31) and during the late nestling – to late fledging phase (June 1 to July 15). The first round of SWHA nest surveys for this study was conducted May 1 – 5 and the second round of SWHA nest surveys was conducted June 12-16.

Each set of surveys was conducted by a team of four biologists. All biologists conducting surveys were equipped with tablets or smartphones running ArcGIS Field Maps depicting the project site and 10-mile buffer as well as all previously documented SWHA nests (described above in the section *Swainson's Hawk Nest Data*) and the locations of any potential nest trees that were identified via desktop review of aerial imagery. During each survey, all portions of the study area with suitable nest trees were surveyed for nesting SWHA using a combination of windshield and pedestrian surveys. All SWHA observations were noted, as well as stick nests with the potential to be used by raptors and nests of other raptor species. During each survey, a note was made in ArcGIS Field Maps for each previously documented nest location and potential nest tree whether any nests or raptors were observed as well as any other pertinent notes such as nest stage, nest disposition, number of raptors observed, life stage (nestling, fledgling, sub-adult, adult etc.), or raptor behavior (e.g., perching, flying overhead, courtship, nesting). If SWHA were observed using a nest or nest tree, subsequent surveys consisted of a follow-up visit to document nesting activity as described above. Surveyors took care not to disturb nesting SWHA to the extent possible while allowing for nest detection and determining nest stage.

In addition to the nest census conducted within the project site and 10-mile radius, four additional surveys for nesting SWHA were conducted by SBC and Rincon biologists within the project site and 0.5-mile radius in order to complete protocol-level surveys for nesting SWHA in support of CEQA documentation and consultation with CDFW as described above in *Swainson's Hawk Use of the Project Site*. Protocol level SWHA nesting surveys were conducted according to guidelines prepared by the SHTAC in the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (SHTAC 2000). The methodology for the protocol-level surveys was similar to that described in the SWHA Nest Surveys section of this report. Nests documented during protocol-level surveys are included in the results of this report.

Cumulative Projects

Review of the Fresno County Planning Commission's Open Applications and Planning Commission Log webpage, and the Fresno County Division of Public Works and Planning's Photovoltaic Facilities Processing webpage provided four past, present, or probable future solar energy projects located within the study area that would potentially be constructed within one year before or after the Project. A list of projects meeting these criteria is shown in Table 2 along with a brief description, location, distance from the project site, and status. The Valley Clean Infrastructure Plan (VCIP) is included in the table for informational purposes but cannot be evaluated as a cumulative project because it is in the early stages of planning and no specific locations have been determined (it does not qualify as a cumulative project under CEQA). Projects could be implemented anywhere throughout Westlands Water District lands as part of this Plan. However, it is unknown at this time whether any projects would be implemented within the Darden Clean Energy Project study area as part of the VCIP.

Comparison of SWHA Nest Density and Foraging Habitat Suitability to Other SWHA Studies in the Project Region

Since the validity of studies like the one conducted for this report are predicated on the quality of the data obtained on the numbers of SWHA nest territories in the study area and the determination of suitable foraging habitat in the study area, a comparison was conducted between the results of this study for the Darden Clean Energy Project and other similar sized studies in the southern San Joaquin Valley. The purpose of the comparison was to see if the results of this current study related to SWHA nest density, and the percentage of suitable foraging habitat are consistent with other such studies.

A comprehensive SWHA nest census conducted in 2011 that covered approximately 900,000 acres in Fresno and Kings counties found a SWHA nest density of 0.07 nesting territories per square mile (mi^2)(Estep 2011). Another SWHA nest census that covered approximately 1,029,785 acres in Fresno and Kings counties and overlapped the prior mentioned study (as well as the Darden Clean Energy Project study area), found a SWHA nest density of 0.06 per mi^2 (Estep and Dinsdale 2012).

A survey of five similar regional SWHA studies conducted in Fresno and Kings counties with study areas ranging in size from roughly 240,000 to 300,000 acres found the proportion of suitable foraging habitat to range from 58.4% (Fresno County; lowest of the five studies) to a high of 81.3% (Kings County; highest of the five studies), with an average of 69% suitable foraging habitat (Estep 2011; Estep 2016a,b; HELIX 2018b, HELIX 2020).

Table 2. Cumulative Solar Projects Within a 10-Mile Radius of the Project Site

Project Name	Description	Location	Distance to Project Site	Status
Scarlet Solar	CUP 3555: 400 Megawatt (MW) PV solar facility with 400 MW energy storage system on 4,089 acres	3.5 miles west-southwest of the community of Tranquility and approximately 6.5 miles east of I-5 along State Route 33 at W South Avenue in unincorporated Fresno County	10.4 miles northwest	Project is currently under construction.[1, 4]
Sonrisa Solar	CUP 3677: 200 MW PV solar facility with battery storage capacity of 100 megawatts on approximately 2,000 acres	Approximately 1.9 miles east of State Route 33 at West Adams Avenue	10.4 miles northwest of the solar facility	Under Fresno County Planning Commission Review.[1]
Tranquility Solar	CUP 3451-58: 200 MW solar facility on 3,732 acres	Intersection of West Floral Avenue and State Route 33	10.1 miles north of the utility switchyard	Under construction, not completed.[2]
Luna Valley Solar	CUP 3671: 200 MW solar facility and energy storage on 1,252 acres	0.90-mile northwest of the intersection of Manning Avenue and South Derrick Avenue	12.7 miles north of the utility switchyard	Approved; Construction permits not yet obtained.[2, 3]
WWD: Valley Clean Infrastructure Plan (VCIP)	A plan that would allow for the construction of solar facilities and electric transmission infrastructure with the potential to provide 20,000 MWs of solar energy and energy storage	Throughout Westlands Water District; specific location undetermined	Specific location undetermined	Project is currently soliciting input from landowners in Westlands Water District.5

Sources: [1]County of Fresno 2023a; [2]County of Fresno 2023b; [3]County of Fresno 2023c; [4]WWD 2023; [5]Golden State Clean Energy

CUP – conditional use permit; WWD – Westlands Water District

4 RESULTS

Raptor Nests Documented in the Study Area

A total of 106 active raptor nests were documented in the study area including 41 active SWHA nests, 28 active red-tailed hawk nests, 35 great-horned owl nests, and 2 red-shouldered hawk nests (Figure 2).

Table 3. Summary of Raptor Nests Documented in the Study Area

Species	Number of Active Nests
Swainson's Hawk	41
Red-tailed Hawk	28
Great-horned owl	35
Red-shouldered hawk	2
Total	**106**

Distribution of SWHA Nests and Habitat in the Study Area

The distribution of SWHA nest territories is fairly even throughout the study area, although there is a noticeable concentration of SWHA nests in the center of the study area in and adjacent to the project site as well as in the northeastern half of the study area. The majority of the suitable foraging habitat is in the central portion of the study area in and adjacent to the project site as well as in a band that extends from southeast of Levis through the project site to southeast of Calflax. It is not surprising that the highest concentration of nests is in the central portion of the study area where suitable foraging habitat is abundant. What may seem counterintuitive is the concentration of nests in the northeastern quadrant of the study area where much of the land is considered unsuitable foraging (orchards and vineyards). However, that area has some of the best nesting habitat in tall ornamental trees (e.g., *Eucalpytus* spp., *Pinus* spp.), in and around rural residences/farmhouses and in riparian trees along Fresno Slough and James Bypass. Interestingly, SWHA individuals were routinely seen in areas dominated by orchards during the surveys. SWHA were observed flying into and out of orchards as well as perching in orchard trees (almond trees primarily) during the surveys. SWHA were also observed on several occasions sitting on the ground and in downed almond trees within almond orchards that had been ripped out and were being prepared for chipping/composting. Based on these observations, it appeared that SWHA may be using almond orchards at least for foraging, although the extent that SWHA are using almond orchards is unclear.

Distribution of Habitat and Impacts in the Study Area (Sub-area Analysis)

In cases where SWHA nests are concentrated in certain areas within the study area, rendering a signification portion of the study area unusable by all but a few nest territories, an additional "sub-area analysis" is done to more accurately reflect the impacts on the regional population (Estep 2017, 2011). The sub-area analysis typically removes a large portion of the study area where nests are at very low density and repeats the analysis of required and available foraging habitat with a greatly reduced acreage of available habitat compared to the remaining regional population. The project site is always retained in the sub-area if such an analysis is done. For the Darden Clean Energy Project, the sub area analysis was not considered to be appropriate because SWHA nests are fairly evenly distributed throughout the study area (Figure 3) and the highest concentration of nests (11 out of 41) is in the

project site and within a one-mile radius. Logically, since the highest concentration of SWHA nests is in and adjacent to the project site, the entire study area is assumed to be important to the regional population of SWHA. Therefore, a sub-area analysis was not done for this study.

Regional Population of SWHA and Habitat Requirements

The regional population of SWHA that would potentially be affected by the Darden Clean Energy Project is 41 nesting pairs in a 372,082-acre (roughly 581 mi^2) study area (Figure 3), which equates to a density of 0.071 nesting territories per mi^2. Attachment C is a summary of SWHA nests observed in the study area and Attachment D contains representative photos. The nest locations are distributed fairly evenly throughout the study area, with the exception of the northwestern quadrant and the far southcentral portion of the study area, where nests are absent or in notably lower abundance. The lack of SWHA nests in the northwestern quadrant is likely due to the general scarcity of suitable nest trees in that region. A total of 205,133 acres of suitable foraging habitat were identified in the study area; the remaining 166,949 acres contained unsuitable land uses for foraging (Figure 4). Of the suitable foraging habitat in the study area, 8,012 acres were High quality (alfalfa), 167,614 acres were Moderate quality, and 29,507 acres were Low quality (Figure 5). Overall, 85.6 percent of the suitable foraging habitat was Moderate- or High-quality habitat. Land uses in the study area are summarized in Table 4.

Table 4. SWHA Foraging Habitat in the Study Area

Habitat Type	Area (ac)	% of Total
Grand Total	**372,082**	**100.0**
Suitable Habitat	*205,133*	*55.1*
High Quality (alfalfa)	8,012	2.2
Moderate Quality	167,614	45.0
Low Quality	29,507	7.9
Unsuitable Habitat	*166,949*	*44.9*

Of the 41 SWHA nests observed, 11 nests were either on the project site or within a one-mile radius (Figure 6). The next highest concentration of SWHA nests was between four and six miles from the project site and nearly 75% of the nests were within a six-mile radius of the project site. The approximate overlap of the potential foraging area and the study area was calculated for each nest using Equation 1. The weighted average overlap of all nests (r) within the study area was 0.744 (Table 5), meaning that roughly 75% of the foraging habitat required for the regional population is within the study area.

Table 5. Proportion of Potential Foraging Area Inside the Study Area

Distance Increment (mi)	Number of Nests	Overlap
0-1	11	0.968
1-2	2	0.905
2-3	3	0.841
3-4	2	0.778
4-5	6	0.716
5-6	6	0.654
6-7	4	0.594
7-8	2	0.534
8-9	4	0.476
9-10	1	0.419
	Weighted Average	**0.744**

Using the results discussed above, the total acreage of foraging habitat required in the study area to sustain the regional population of SWHA was calculated using Equation 2:

$$Y = 41 \cdot 6{,}820 \cdot 0.6 \cdot 0.856 \cdot 0.744 = 106{,}848$$

Where 41 is the size of the regional population (n); 6,820 is the baseline average home range size; 0.6 is the correction for 40 percent overlap among home ranges (p); 0.856 is the proportion of the suitable foraging habitat in the study area that is Moderate- or High-quality (q); and 0.744 is the weighted average proportion of potential foraging area for all nest territories in the regional population that is inside the study area (r).

The total amount of foraging habitat in the study area required by the regional SWHA population was calculated to be 106,848 acres. The total amount of suitable foraging habitat in the study area is 205,133 acres. Accounting for the total required acreage of foraging habitat for all 41 pairs of SWHA, the study area contains approximately 98,285 acres of surplus suitable foraging habitat. For purposes of this study, the CEQA significance threshold is 70 percent of the existing surplus, or 68,800 acres (Table 6).

Table 6. Project Impacts and CEQA Significance Threshold

	Existing (acres)	Project 4,818 acres	% of Existing	Cum.[1] 4,448 acres	% of Existing
Foraging Habitat Required	106,848	--	--	--	--
Suitable Foraging Habitat	205,133	200,315	97.6	195,867	95.5
Surplus	98,285	93,467	95.1	89,019	90.6
CEQA Significance Threshold	68,800		--		--
Less than Significant Impact[2]/ Surplus Remaining After Project Development	29,485	24,667	83.7	20,219	68.6

[1] Acreage of all planned or reasonably foreseeable solar projects within the study area used for the cumulative analysis that provide suitable foraging habitat for SWHA (see discussion in *Cumulative Impacts*).

[2] Impact acreage that would be below the CEQA threshold of significance, or 98,285-68,800=98,285·0.3=29,485.

Project Impacts to SWHA foraging Habitat

Project-Level Impacts

The proposed project would result in the conversion of approximately 9,510 acres of active agricultural land in the study area into a solar PV generating facility. Based on panel dimensions, preliminary site design and engineering feedback, 48% of the study area was conservatively assumed to be rendered unsuitable foraging for SWHA (i.e., permanently impacted by panel cover at peak horizontal orientation and other permanent project infrastructure). As discussed in *Project Location and Description*, an estimated maximum of 48 percent of the area within a typical solar array block consists of solar PV panel surface and other structures when viewed from above as well as other structures such as substations, BESS, and inverters, and the other 52 percent remains open ground surface and is available to SWHA for foraging. Removal of an estimated maximum of 4,818 acres of habitat (9,120 x 0.48) (see Table 1) would reduce the surplus SWHA foraging habitat in the study area to 93,467 acres, which is 95.1 percent of the existing surplus, and well above the 70-percent CEQA significance threshold (Table 6). The project-level

impact to the regional population of SWHA through foraging habitat loss would be less than significant, and no compensatory mitigation for impacts to foraging habitat would be required at the project level.

Cumulative Impacts

In addition to a project-specific assessment, CEQA also requires that a cumulative assessment be conducted to determine whether the project's incremental impacts are cumulatively considerable when added to other past, present, and reasonably foreseeable future actions. In order to do this, the study area is used as the cumulative impact assessment area. For purposes of this assessment, the cumulative impact is defined as all planned and proposed solar energy projects within the roughly 10-mile radius study area. It does not include other types of projects or other land use changes that would potentially remove or modify Swainson's hawk foraging habitat (Estep 2016). When considering total project acreage, solar energy projects comprise the majority of planned and proposed non-agricultural projects in the Study Area that could impact SWHA foraging habitat. Additionally, the 70% significance threshold is conservatively set to accommodate land use changes, resulting in the CEQA significance threshold being set substantially higher than the minimum amount of foraging habitat required in the study area to sustain the regional population.

In addition to the proposed Darden Clean Energy Project, there are four planned or reasonably foreseeable solar projects that are considered in the cumulative analysis (Table 2). Cumulative projects are depicted in Figure 7, along with the acreage of each project that overlaps the study area. It is worth noting that solar projects in the study area that have already been constructed and are evident on aerial imagery were classified as developed land during the quantification of suitable SWHA foraging habitat. Therefore, existing solar projects are already depicted as unsuitable habitat (Figure 4) and are not discussed separately in this report. The total area of the four cumulative projects that falls within the study area is 6,946 acres. Of the 6,946 acres of cumulative projects, 2,498 acres have already developed (Tranquillity Solar) and are already identified as unsuitable foraging habitat (See Figure 4). Therefore, an additional 4,448 acres of suitable SWHA foraging habitat would be impacted by the cumulative solar projects evaluated in this analysis (Figure 8).

When considering development of the cumulative projects, the surplus SWHA foraging habitat in the study area would be reduced to 89,019 acres (conservatively assuming 100% impact for these projects), which is 90.6 percent of the existing surplus and above the 70-percent CEQA significance threshold (Table 6). Therefore, the project would contribute to a less than significant cumulative impact to the regional population of SWHA through foraging habitat loss, and no compensatory mitigation would be required for cumulative impacts.

5 CONCLUSIONS

The proposed Darden Clean Energy Project would not result in a significant impact to the regional population of SWHA through loss of suitable foraging habitat at the project level, nor would it contribute to a significant cumulative impact in concert with other planned or reasonably foreseeable solar projects. After project development, the amount of surplus suitable foraging habitat for SWHA in the study area would remain greater than 70 percent of the existing surplus at both the project and cumulative level, and therefore provide sufficient surplus foraging habitat to allow for population growth and resiliency to disturbance, as well as to changes to the foraging landscape through changes in agricultural land uses.

The loss of 4,818 acres of agricultural land will not affect the distribution or abundance of nesting SWHAs in the study area. Because it represents only 2.3% of the available foraging habitat within the study area, its conversion is negligible relative to availability, and particularly with regard to the relatively small number of SWHAs that nest in the study area. The loss of 4,818 acres of agricultural land would not represent a significant loss of foraging habitat for SWHAs and does not represent a significant CEQA impact. At the cumulative level considering other solar projects in the study area in addition to the Darden Clean Energy Project, all planned, or reasonably foreseeable solar projects represent approximately 4.5% of the total available foraging habitat within the study area which leaves significantly more foraging habitat than is needed by the regional population.

The analysis performed for this study is based on previously accepted methods (Estep 2017, 2015, 2011) and makes use of the best available data. The analysis considers impacts to SWHA at a more biologically realistic scale than the method employed in the 1994 CDFW guidelines while remaining logistically feasible as well as generalizable to a wide range of projects and locations.

In conclusion, the proposed project would not result in a significant reduction (based on the significance threshold and assessment methods used here) of available SWHA foraging habitat at either the project or cumulative level, and that as a result of this analysis no mitigation should be required as per CEQA guidance.

6 DISCUSSION

The results of this SWHA foraging habitat analysis conducted for the Darden Clean Energy Project identified a regional population of 41 SWHA nesting pairs/nest territories within the roughly 10-mile radius study area (nest density of 0.071 per mi^2). This finding is consistent with or slightly higher than nest densities previously documented in the southern San Joaquin Valley (Estep 2011; Estep and Dinsdale 2012) and also is consistent with prior studies that indicate that the nest density in the southern San Joaquin Valley is significantly lower than the SWHA nest density documented in Sacramento County (0.37 per sq. mi^2) and Yolo County (0.38 per mi^2) as discussed in Estep (2016). Because the 41 SWHA nest territories that were identified in the study area during the census for the Darden Clean Energy Project is consistent both with prior large-scale SWHA nest surveys in the southern San Joaquin Valley and historic nest data available for the study area (discussed in *Swainson's Hawk Nest Data* section), it is assumed to be a reliable estimate of the number of SWHA nesting pairs/nesting territories in the study area.

The approximately 372,082-acre Darden Clean Energy Project study area currently provides an estimated 205,133 acres of suitable foraging habitat, which equates to 55% of the total land cover. The estimated percentage of suitable foraging habitat is lower than what has been reported in other similar regional SWHA studies conducted in Fresno and Kings counties, which reported an average of 69% suitable foraging habitat with a range of 58.4% to 81.3% (Estep 2011; Estep 2016a, b; HELIX 2018b, HELIX 2020). Of the suitable foraging habitat in the study area, approximately 86% is considered moderate or high quality. The regional population of SWHA requires an estimated 106,848 acres of foraging habitat to sustain itself. Therefore, there is an estimated surplus of 98,285 acres of suitable foraging habitat in the study area. Surplus foraging habitat is needed to sustain the regional SWHA population to allow for interannual variation in the regional population caused by mortality and recruitment, allow for resilience in the population to environmental factors outside the scope of this analysis, and to account for other potential sources of error. For the purposes of this study, the CEQA significance threshold is set at 70 percent of the existing surplus, or 68,800 acres, meaning that a reduction in surplus foraging habitat below 68,800 acres would result in a significant impact on SWHA.

Removal of an estimated maximum of 4,818 acres of habitat as a result of the Darden Clean Energy Project would reduce the surplus SWHA foraging habitat in the study area to 93,467 acres, which is 95.1 percent of the existing surplus, and well above the 70-percent CEQA significance threshold. Even if the entire roughly 9,510-acre project site was considered to be a complete loss of SWHA foraging habitat, the Darden Clean Energy Project would reduce the available surplus to 88,775 acres, or 90.3% of the available surplus. Therefore, the project's impact to the regional population of SWHA through foraging habitat loss would be less than significant, and no compensatory mitigation for impacts to foraging habitat would be required at the project level.

Removal of an additional 4,448 acres of suitable SWHA foraging habitat as a result of all planned or reasonably foreseeable solar energy projects would reduce the available surplus to 89,019 acres (assuming project impacts of 4,818 acres), which is 90.6 percent of the existing surplus, and well above the 70-percent CEQA significance threshold. Alternatively, assuming project impacts of 9,510 acres, removal of an additional 4,448 acres of suitable SWHA foraging habitat as a result of all planned or reasonably foreseeable solar energy projects would reduce the available surplus to 84,327 acres, which is 85.8 percent of the existing surplus. Therefore, under either scenario, the cumulative impact to the regional population of SWHA through foraging habitat loss would be less than significant, and no compensatory mitigation for impacts to foraging habitat would be required at the cumulative level.

7 REFERENCES

Babcock, K.W. 1995. Home range and habitat use of breeding Swainson's hawks in the Sacramento Valley of California. Journal of Raptor Research, 29(3): 193-197.

Bechard, M. J. 1982. Effect of Vegetative Cover on Foraging Site Selection by Swainson's Hawk. Condor 84:153–159.

California Department of Fish and Wildlife (CDFW). 1994. Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (*Buteo swainsoni*) in the Central Valley of California. November 1.

Clark Jr., H. O., Biddy, J.L., Dayton, T., Dinsdale, J.L., and J. A. Estep. 2022. Swainson's Hawk Use of Utility Poles and Similar Structures as Nest Sites. Central Valley Birds, Summer 2022.

Estep, J. 2021. Swainson's Hawk and Other Raptor Foraging Use of Solar Array Fields within an Agricultural Landscape in Sacramento County. Prepared for Dudek. November.

2017. The Distribution and Abundance of Nesting Swainson's Hawks in the Vicinity of the Proposed RE Mustang 2 Solar Generating Facility. Prepared by Estep Environmental Consulting, Sacramento, CA, for RE Mustang Two LLC, San Francisco, CA. January.

Estep 2016a. The Distribution and Abundance of Nesting Swainson's Hawks in the Vicinity of the Proposed RE Scarlet Solar Generation Facility. Prepared for RE Scarlet LLC. September.

Estep 2016b. The Distribution and Abundance of Nesting Swainson's Hawks in the Vicinity of the Proposed RE Mustang Two Solar Generation Facility. Prepared for RE Mustang Two LLC. August.

2015. A Proposed Conservation Strategy for the Swainson's Hawk in Yolo County. Prepared for the Yolo County Natural Heritage Program. March 20, 2015.

2013. Swainson's hawk and other foraging raptor use of solar array fields within an agricultural landscape in Sacramento County. Prepared for Recurrent Energy, San Francisco, CA. October.

2011. The distribution and abundance of nesting Swainson's hawks in the vicinity of the proposed RE Tranquillity LLC solar generating facility. Prepared by Estep Environmental Consulting, Sacramento, CA, for RE Tranquillity LLC, San Francisco, CA. November.

2009. The influence of vegetation structure on Swainson's Hawk (*Buteo swainsoni*) foraging habitat suitability in Yolo County, CA. Yolo County Habitat-Natural Community Conservation Plan (http://www.yoloconservationplan.org /.2013).

1989. Biology, movements, and habitat relationships of the Swainson's hawk in the Central Valley of California, 1986-1987. California Department of Fish and Game, Wildlife Management Division, Nongame Bird and Mammal Section, Sacramento, CA.

Estep, J.A. and J.L. Dinsdale. 2012. Distribution, abundance, and habitat associations of nesting Swainson's hawks in the central San Joaquin Valley, California. CVBC Bulletin, 15(4): 84-106.

Fresno, County of. 2023a. Photovoltaic Facilities Processing. https://www.fresnocountyca.gov/Departments/Public-Works-and-Planning/divisions-of-public-works-and-planning/development-services-division/planning-and-land-use/photovoltaic-facilities-p-1583. Accessed August 2023.

2023b. Open Applications. https://www.fresnocountyca.gov/Departments/Public-Works-and-Planning/divisions-of-public-works-and-planning/development-services-division/planning-and-land-use/planning-commission/open-applications. Accessed August 2023.

2023c. Planning Commission Log. https://www.fresnocountyca.gov/Departments/Public-Works-and-Planning/divisions-of-public-works-and-planning/development-services-division/planning-and-land-use/planning-commission/planning-commission-log. Accessed August 2023.

Golden State Clean Energy. 2023. Valley Clean Infrastructure Plan (VCIP). https://goldenstatecleanenergy.com/project/valley-clean-infrastructure/. Accessed August 2023.

HELIX Environmental Planning, Inc. (HELIX). 2020. Luna Valley Solar Project, Fresno County – Analysis of Impacts to Swainson's Hawk Nesting and Foraging Habitat. Prepared for Clearway Energy Group, LLC. August.

2018a. Swainson's Hawk Foraging Use of a Large-scale Solar Generating Facility in an Agricultural Landscape. February.

2018b. RE Scarlet Solar Generation Project, Fresno County – Analysis of Impacts to Swainson's Hawk Foraging Habitat. Prepared for Recurrent Energy. October.

Swainson's Hawk Technical Advisory Committee (SHTAC). 2000. Recommended timing and methodology for Swainson's hawk nesting surveys in California's central valley. May 31.

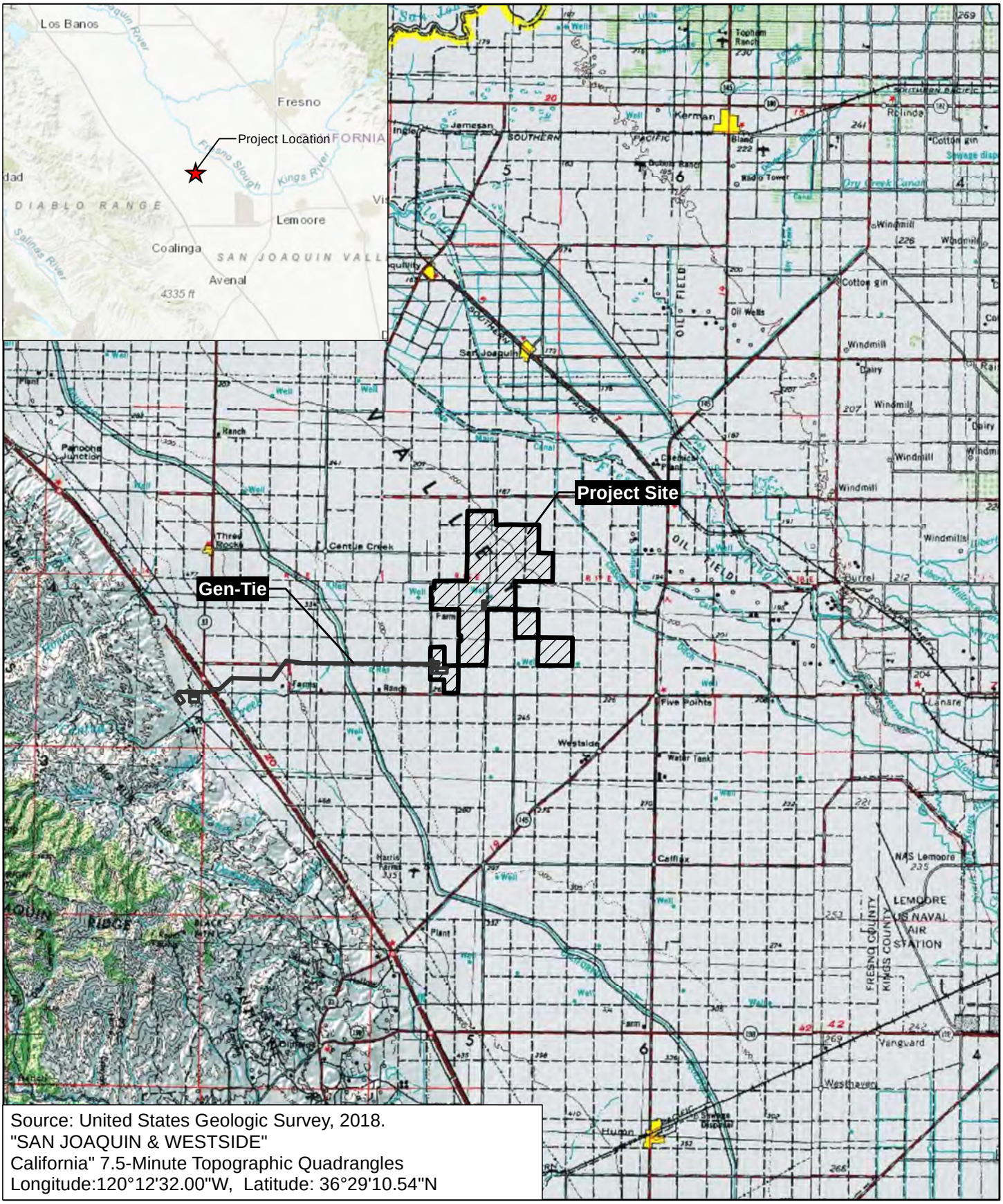
Swolgaard, C.A., K.A. Reeves, and D.A. Bell. 2008. Foraging by Swainson's hawks in a vineyard-dominated landscape. Journal of Raptor Research, 42(3): 188-196.

Woodbridge, B. 1991. Habitat selection by nesting Swainson's hawks: a hierarchical approach. M.S. thesis, Oregon State University, Corvallis.

Westlands Water District (WWD). 2023. Farming the Sun Solar Power in Westlands. https://wwd.ca.gov/wp-content/uploads/2023/06/farming-the-sun.pdf. Accessed August 2023.

Attachment A

Figures



Source: United States Geologic Survey, 2018.
"SAN JOAQUIN & WESTSIDE"
California" 7.5-Minute Topographic Quadrangles
Longitude:120°12'32.00"W, Latitude: 36°29'10.54"N

N

0 2.5 5
Miles

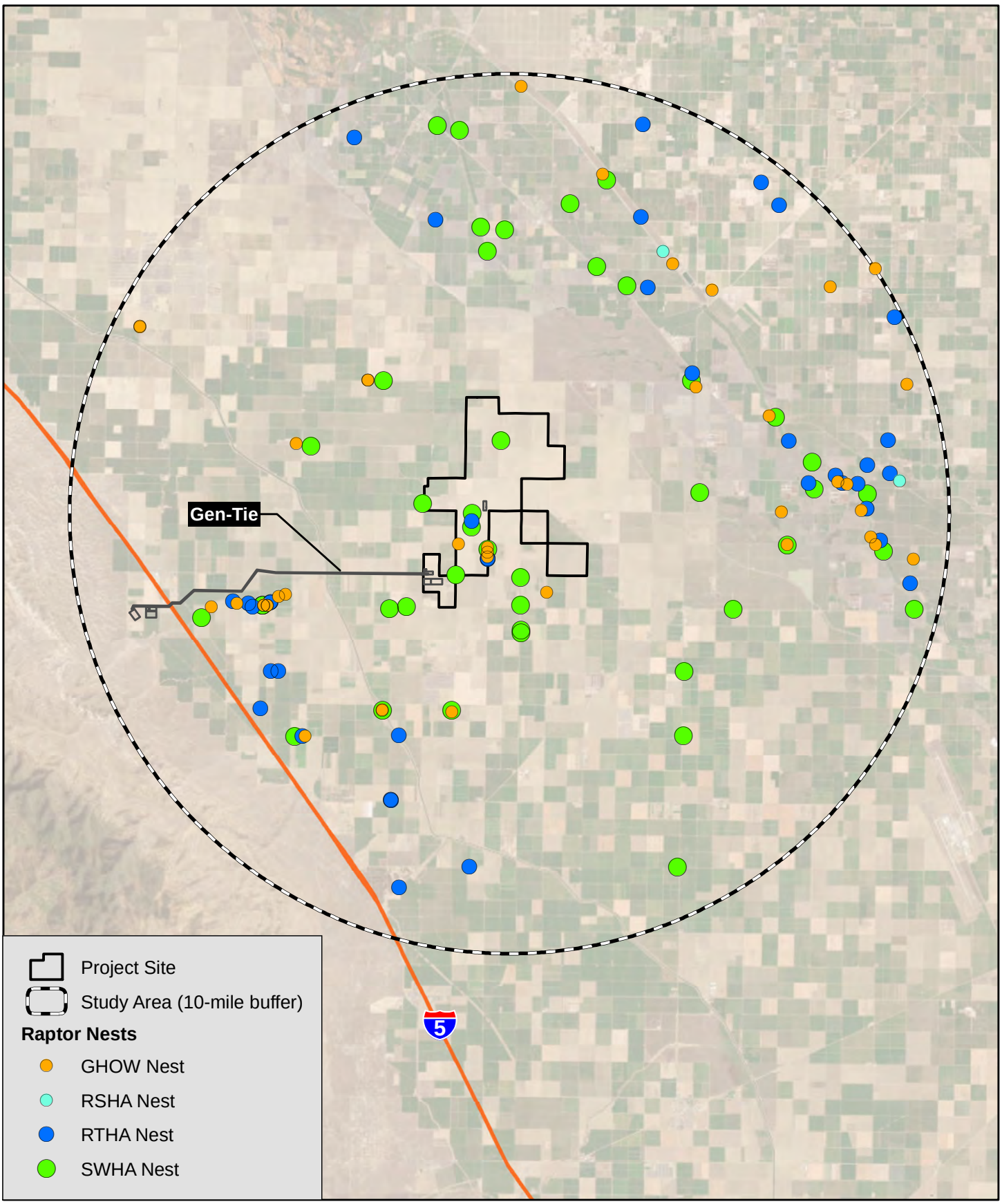
Figure 1

Regional Location and Vicinity

DardenClean Energy Project

Fresno County, CA

Stringer Biological Consulting



Aerial Source: Maxar (07/2021)
Data Sources: Stringer Biological Consulting, Inc.; Rincon Consultants, Inc. (2023)

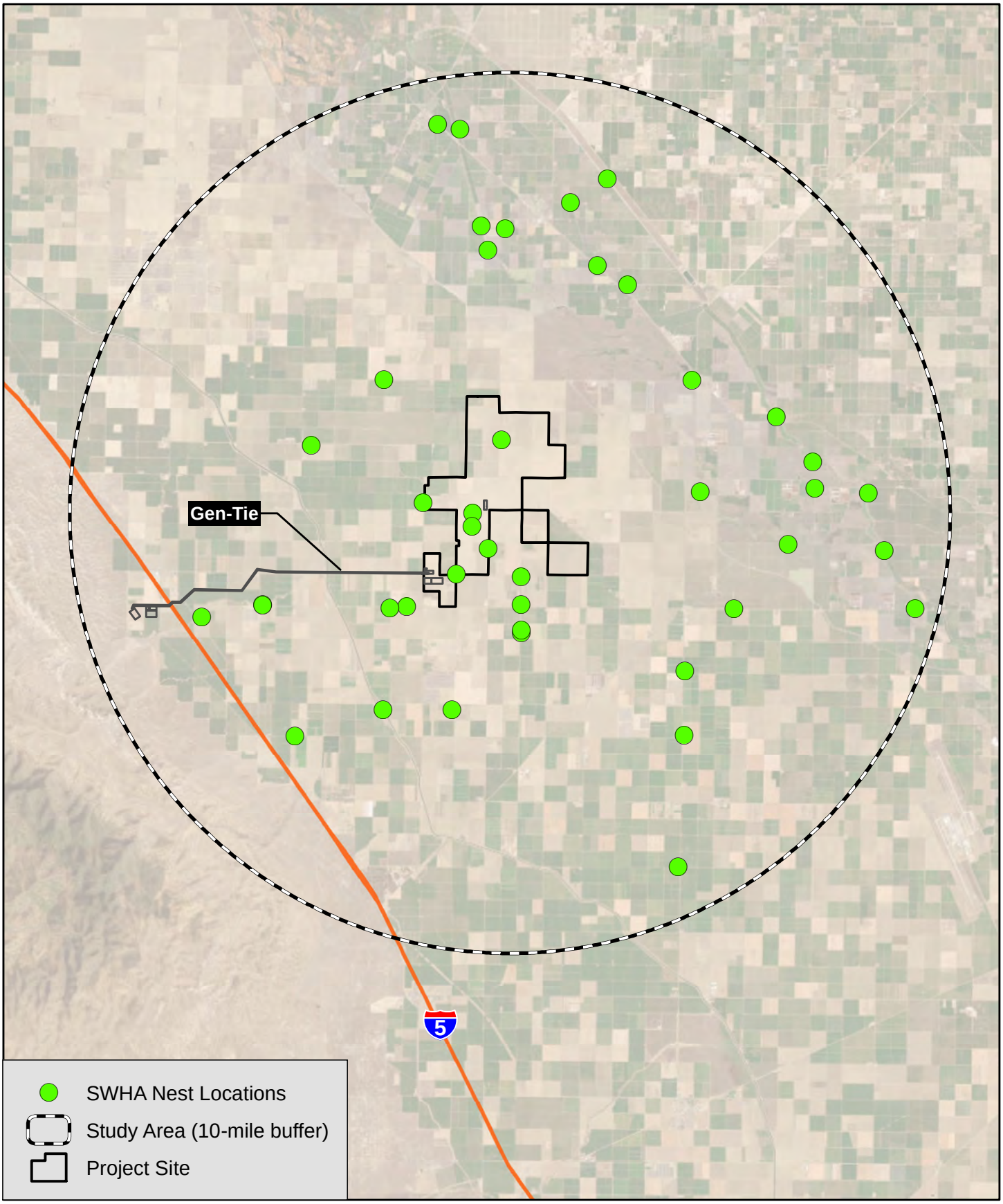
Figure 2

Raptor Nests Observed in the Study Area

Darden Clean Energy Project

Fresno County, CA

Stringer Biological Consulting



Aerial Source: Maxar (07/2021)
Data Sources: Stringer Biological Consulting, Inc.; Rincon Consultants, Inc. (2023)

Figure 3

Swainson's Hawk Nest Locations

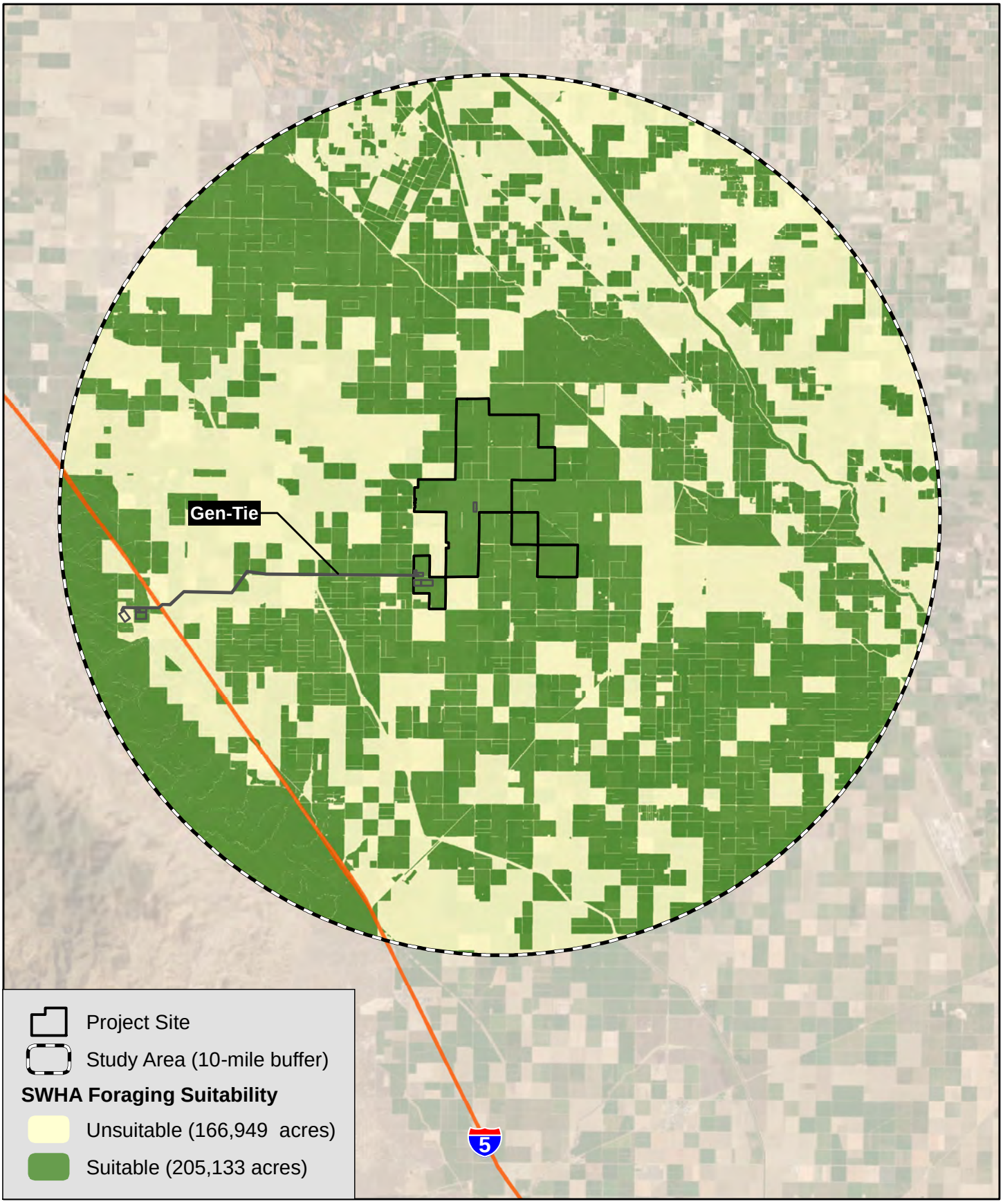
Darden Clean Energy Project

Fresno County, CA

Stringer Biological Consulting

0 2.5 5
Miles

N



Aerial Source: Maxar (07/2021)
Data Sources: Department of Water Resources (2023)

0 2.5 5
Miles

N

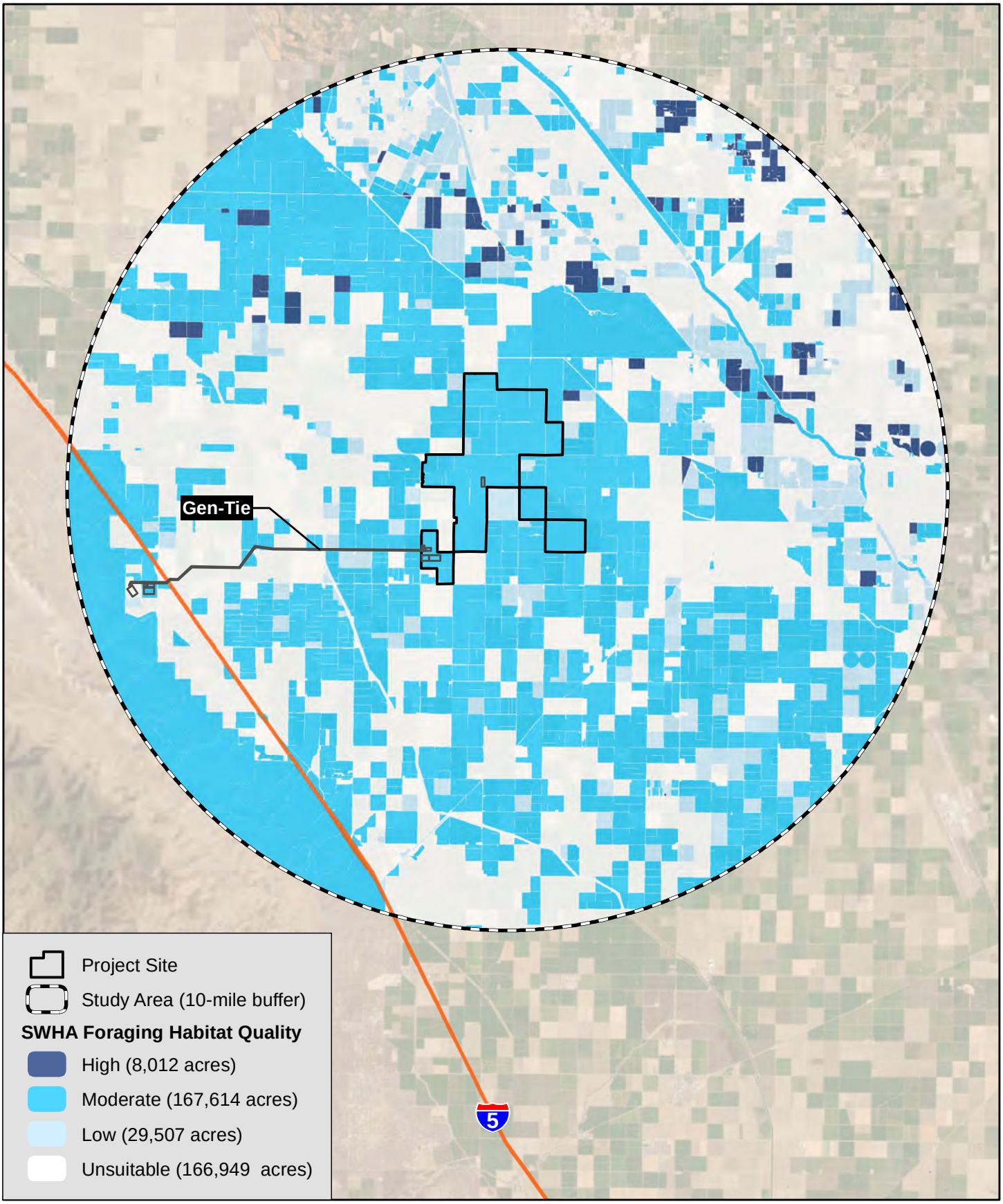
Figure 4

Swainson's Hawk Suitable Foraging Habitat

Darden Clean Energy Project

Fresno County, CA

Stringer Biological Consulting



Aerial Source: Maxar (07/2021)
Data Sources: Department of Water Resources (2023)

0 2.5 5
Miles

N

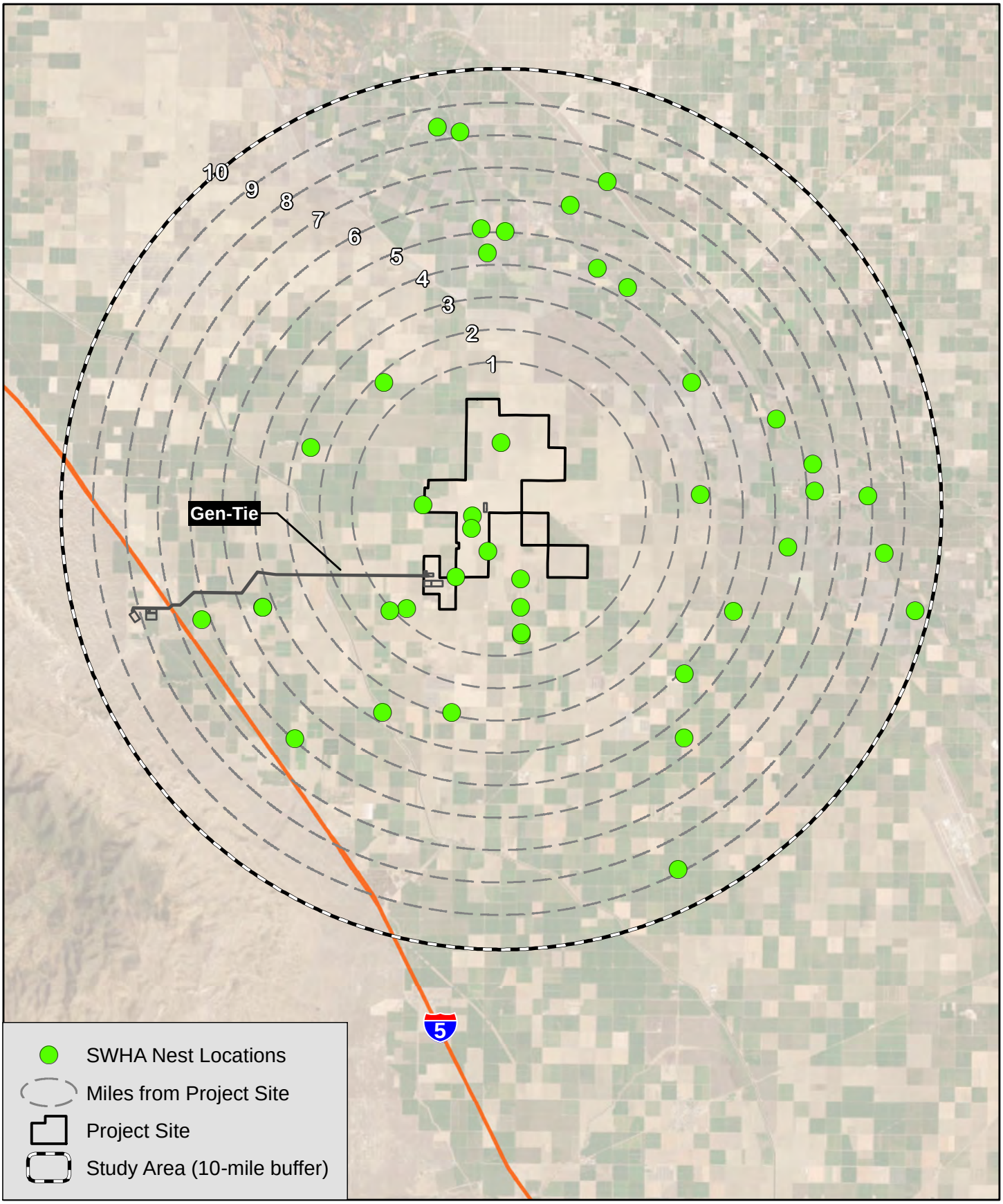
Figure 5

Swainson's Hawk Foraging Habitat Quality

Darden Clean Energy Project

Fresno County, CA

Stringer Biological Consulting



Aerial Source: Maxar (07/2021)
Data Sources: Stringer Biological Consulting, Inc.; Rincon Consultants, Inc. (2023)

Figure 6

Swainson's Hawk Nest Distances from Project Site

Darden Clean Energy Project

Fresno County, CA

Stringer Biological Consulting

0 2.5 5
Miles

N

Attachment B

Land Use Crosswalk

Crop Type/Land Cover	Land_Type	Foraging (Y=1; N=0)	Quality (0, 1=low; 2=mod, or 3=high)
Tomatoes (Processing)	irrigated cropland	1	2
Almonds	orchard/vineyard	0	0
Cotton	irrigated cropland	1	1
Grain and Hay - Misc.	alfalfa/ hay crop	1	2
field Misc.	orchard/vineyard	0	0
Bush berries	orchard/vineyard	0	0
Beans (dry)	irrigated cropland	1	1
Onions and Garlic	irrigated cropland	1	2
Young Perennial	orchard/vineyard	0	0
Melons, Squash, and Cucumbers	irrigated cropland	1	1
Lettuce or Leafy Greens	irrigated cropland	1	2
Corn, Sorghum or Sudan	irrigated cropland	1	1
Vineyards	orchard/vineyard	0	0
Wheat	irrigated cropland	1	2
Alfalfa and alfalfa mixtures	alfalfa/ hay crop	1	3
Peaches and Nectarines	orchard/vineyard	0	0
Truck Crops - Misc.	orchard/vineyard	1	1
Olives	orchard/vineyard	0	0
Pomegranates	orchard/vineyard	0	0
Apples	orchard/vineyard	0	0
Pasture - Mixed	irrigated pasture	1	2
Carrots	irrigated cropland	1	1
Cole crops	irrigated cropland	1	1
Walnuts	orchard/vineyard	0	0
Deciduous - Misc.	orchard/vineyard	0	0
Citrus and Subtropical	orchard/vineyard	0	0
Field Misc.	irrigated cropland	1	1
Cherries	orchard/vineyard	0	0
Peppers (Chili, Bell, etc.)	irrigated cropland	1	2
Pasture - Miscellaneous Grasses	irrigated pasture	1	2
Potato or Sweet potato	irrigated cropland	1	2
Urban Development	Developed	0	0
Annual grassland/pasture	Uncultivated Land	1	2
Idle field/cropland	Uncultivated Land	1	2
Dairy/Chicken farm/Other	Developed	0	0
Residential/Urban	Developed	0	0
Commercial/Retail/Institution	Developed	0	0
Solar facilities	Developed	0	0
Industrial	Developed	0	0
agricultural pond	Developed	0	0
Ruderal	Uncultivated Land	1	1
irrigated cropland (unk)	irrigated cropland	1	1
Cattle Pens (beef cows)	Developed	0	0
perennial wetlands	Wetlands/Waters	0	0
winter wheat/cotton	irrigated cropland	1	2

Attachment C

Summary of SWHA Nests in the Study Area

Attachment C. Summary of Swainson's Hawk Nests Observed in the Study Area

Site #	USGS Quad	Location	Lat./Long.	Nesting Habitat	Nest Tree	Nest Status Notes
SH1	Jamesan	Railroad tracks near junction of Colorado Road and S. Sonoma Ave	36.645118°N/ -120.243258°S	Tree line adjacent to railroad tracks	Eucalyptus	Active nest territory; undetermined reproductive status.
SH2	Jamesan	S Denver Ave between W Lincoln Ave and W Clayton Ave	36.643241°N/ -120.230769°S	Tree in backyard of rural residence	Eucalyptus	Active nest territory; undetermined reproductive status.
SH3	San Joaquin	S Levee Road 900 feet south of Manning Ave.	36.599982°N/ -120.218276°S	Riparian tree	Cottonwood	Active nest territory; undetermined reproductive status.
SH4	San Joaquin	W Cherry Lane 500 feet east of S El Dorado Ave	36.598773°N/ -120.204928°S	Tree in backyard of rural residence	Eucalyptus	Active nest territory; undetermined reproductive status.
SH5	San Joaquin	S Levee Road 500 feet north of W Dinuba Ave	36.589282°N/ -120.214516°S	Riparian tree	Willow	Active nest territory; undetermined reproductive status.
SH6	San Joaquin	Southeast side of W Parlier Ave and South Yuba Ave	36.610905°N/ -120.168903°S	Roadside tree	Eucalyptus	Female incubating eggs when last observed.
SH7	San Joaquin	James Bypass levee between W Sumner Ave and W South Ave	36.62184°N/ -120.148421°S	Riparian tree	Willow	Successful; 2 young fledged
SH8	San Joaquin	S Colorado Ave 350 feet north of W Huntsman	36.582866°N/ -120.15342°S	Roadside tree	Willow	Active nest territory; undetermined reproductive status.
SH9	San Joaquin	W Floral Ave 1500 feet east of S Colorado Ave	36.574494°N/ -120.136561°S	Roadside tree	Eucalyptus	Active nest territory; undetermined reproductive status.

Site #	USGS Quad	Location	Lat./Long.	Nesting Habitat	Nest Tree	Nest Status Notes
SH10	Helm	Southwest side of Helm Elementary School	36.532186°N/ -120.100188°S	Tree row at elementary school	Eucalyptus	Female brooding when last observed
SH11	Helm	James Bypass 350 feet south of W Conejo Ave	36.516214°N/ -120.053072°S	Willow	Isolated tree	Active nest territory; undetermined reproductive status.
SH12	Five Points	Along Fresno Slough 2,300 feet southeast of intersection of Lassen Ave and W Elkhorn Ave	36.482029°N/ -120.094852°S	Willow	Riparian tree	Active nest territory; undetermined reproductive status. Private Property.
SH13	Five Points	Fresno Slough 1.6 miles northwest of Elkhorn Bridge	36.496101°N/ -120.032586°S	Cottonwood	Isolated tree	Active nest territory; undetermined reproductive status.
SH14	Five Points	W Elkhorn Ave and S Howard Ave	36.484228°N/ -120.031376°S	Eucalyptus	Roadside tree row	Active nest territory; undetermined reproductive status.
SH15	Five Points	Fresno Slough 1,500 feet south of Elkhorn Bridge	36.48224°N/ -120.001677°S	Cottonwood	Levee tree row	Active nest territory; undetermined reproductive status.
SH16	Five Points	W Cerini Ave 0.8 mi west of S Howard Ave	36.458995°N/ -120.045824°S	Eucalyptus	Rural residential	Female incubating eggs when last observed
SH17	Burrel	Fresno Slough approximately 800 feet south of W Cerini Ave extension	36.456823°N/ -119.992408°S	Willow	Levee tree row	Active nest territory; undetermined reproductive status.
SH18	Burrel	McKean Farms, W Mt. Whitney Ave	36.430828°N/ -119.974901°S	Eucalyptus	Horticultural tree, industrial property	Active nest territory; undetermined reproductive status. Private Property.

Site #	USGS Quad	Location	Lat./Long.	Nesting Habitat	Nest Tree	Nest Status Notes
SH19	Five Points	W Mt. Whitney Ave; 1.5 miles east of Five Points	36.430026°N/ -120.075596°S	Cottonwood	Rural residential	Female incubating eggs when last observed
SH20	Five Points	Lassen Ave and W Excelsior Ave	36.401796°N/ -120.102439°S	Unknown horticultural tree	Agricultural processing facility	Successful; one young fledged
SH21	Calflax	Lassen Ave and W Jeffrey Ave	36.373038°N/ -120.102242°S	Eucalyptus	Rural residential tree row	Female incubating eggs when last observed
SH22	Calflax	W Ford Ave and Hwy 269	36.314135°N/ -120.104803°S	Eucalyptus	Rural residential	One nestling in nest when last observed
SH23	Westside	Telesis Onion Company; S Colusa Ave, 1,600 feet north of W Laguna Ave	36.419333°N/ -120.193197°S	Eucalyptus	Rural residential tree row	Active nest territory; undetermined reproductive status.
SH24	Westside	Telesis Onion Company; S Colusa Ave, 1,200 feet north of W Laguna Ave	36.418203°N/ -120.193196°S	Eucalyptus	Rural residential tree row	Adult returning to nest with food; unknown number of nestlings
SH25	Westside	American Fertilizer; S Colusa Ave and W Mt. Whitney Ave	36.430637°N/ -120.19361°S	Eucalyptus	Tree row	Active nest territory; undetermined reproductive status.
SH26	Westside	W Harlan Ave and S Colusa Ave	36.443126°N/ -120.193817°S	Eucalyptus	Roadside tree row	Successful; two young fledged
SH27	Westside	Approximately 970 feet southwest of the intersection of W Paige Ave and S Napa Ave	36.383117°N/ -120.231127°S	Eucalyptus	Rural residential tree row	Active nest territory; undetermined reproductive status.
SH28	Tres Picos Farms	Canal bank 1,100 feet south of W Paige Ave	36.382776°N/ -120.269463°S	Cottonwood	Isolated tree	Active nest territory; undetermined reproductive status.

Site #	USGS Quad	Location	Lat./Long.	Nesting Habitat	Nest Tree	Nest Status Notes
SH29	Domengine Ranch	600 feet east of the intersection of W Jeffrey and S San Mateo	36.370428°N/ -120.317855°S	Tamarisk	Roadside tree row	One nestling heard crying from nest when last observed
SH30	Westside	S El Dorado Ave 900 feet south of W Cerini Ave	36.455492°N/ -120.212207°S	Eucalyptus	Tree row	Successful; one young fledged
SH31	Westside	W Harlan Ave and S Napa Ave	36.443791°N/ -120.229718°S	Cottonwood	Isolated tree	Female incubating/brooding when last observed
SH32	Tres Picos Farms	W Mt. Whitney Ave between S Amador Ave and S Sonoma Ave	36.429331°N/ -120.256861°S	Eucalyptus	Tree row	One nestling present when last observed
SH33	Tres Picos Farms	W Mt. Whitney Ave and S Amador Ave	36.428302°N/ -120.266171°S	Eucalyptus	Roadside tree row/rural residential	Active nest territory; undetermined reproductive status.
SH34	Westside	Sound edge of tree row on W Davis Ave between S Napa Ave and S El Dorado Ave	36.465565°N/ -120.221424°S	Eucalyptus	Tree row	Active nest territory; undetermined reproductive status.
SH35	Westside	North edge of tree row on W Davis Ave between S Napa Ave and S El Dorado Ave	36.471398°N/ -120.221029°S	Eucalyptus	Tree row	Successful; one young fledged
SH36	Westside	S Sonoma Ave 1,150 feet north of W Davis Ave	36.475739°N/ -120.248579°S	Eucalyptus	Tree row	Successful; one young fledged

Site #	USGS Quad	Location	Lat./Long.	Nesting Habitat	Nest Tree	Nest Status Notes
SH37	Tres Picos Farms	W Mt. Whitney Ave approximately 450 feet east of S Stanislaus Ave	36.428929°N/ -120.336767°S	Cottonwood	Riparian	Active nest territory; undetermined reproductive status.
SH38	Tres Picos Farms	Cantua Creek; 2,900 feet east of Interstate 5	36.423165°N/ -120.370561°S	Cottonwood	Riparian	Active nest territory; undetermined reproductive status.
SH39	Cantua Creek	W Clarkson Ave; East side of the community of Cantua Creek	36.500907°N/ -120.311166°S	Pine	Rural residential	Active nest territory; undetermined reproductive status.
SH40	Cantua Creek	North side of W Kamm Ave between S Calaveras Ave and S Amador Ave	36.530506°N/ -120.271166°S	Cottonwood	Isolated tree	Active nest territory; undetermined reproductive status.
SH41	San Joaquin	S El Dorado Ave approximately 850 feet north of W Clarkson Ave	36.504286°N/ -120.205599°S	Cottonwood	Isolated tree	Female incubating eggs when last observed

Attachment D

Photolog

Photo 1. Typical view of agricultural fields in the project site with a dense crop of mustard. Photo taken 4/4/23.

Photo 2. View of a linear grove of Eucalyptus trees in the project site. Two SWHA nests are in this tree grove. Photo taken 4/4/23.

Photo 3. SWHA Nest Tree (SH1; see table in Attachment C). Eucalyptus tree along railroad tracks near the junction of Colorado Road and S. Sonoma Ave. Photo taken 4/17/23.

Photo 4. SWHA Nest Tree (SH2; see table in Attachment C). Eucalyptus tree in backyard of residence on S Denver Ave between W Lincoln Ave and W Clayton Ave. Taken 4/17/23.

Photo 5. SWHA Nest Tree (SH32; see table in Attachment C). Eucalyptus tree in tree row along W Mt. Whitney Ave between S Amador Ave and S Sonoma Ave. Photo taken 4/17/23.

Photo 6. SWHA Nest Tree (SH5; see table in Attachment C). Willow tree along S Levee Road 500 feet north of W Dinuba Ave. Photo taken May 2023.

Photo 7. SWHA Nest Tree (SH11; see table in Attachment C). Willow tree in James Bypass 350 feet south of W Conejo Ave. Photo taken May 2023.

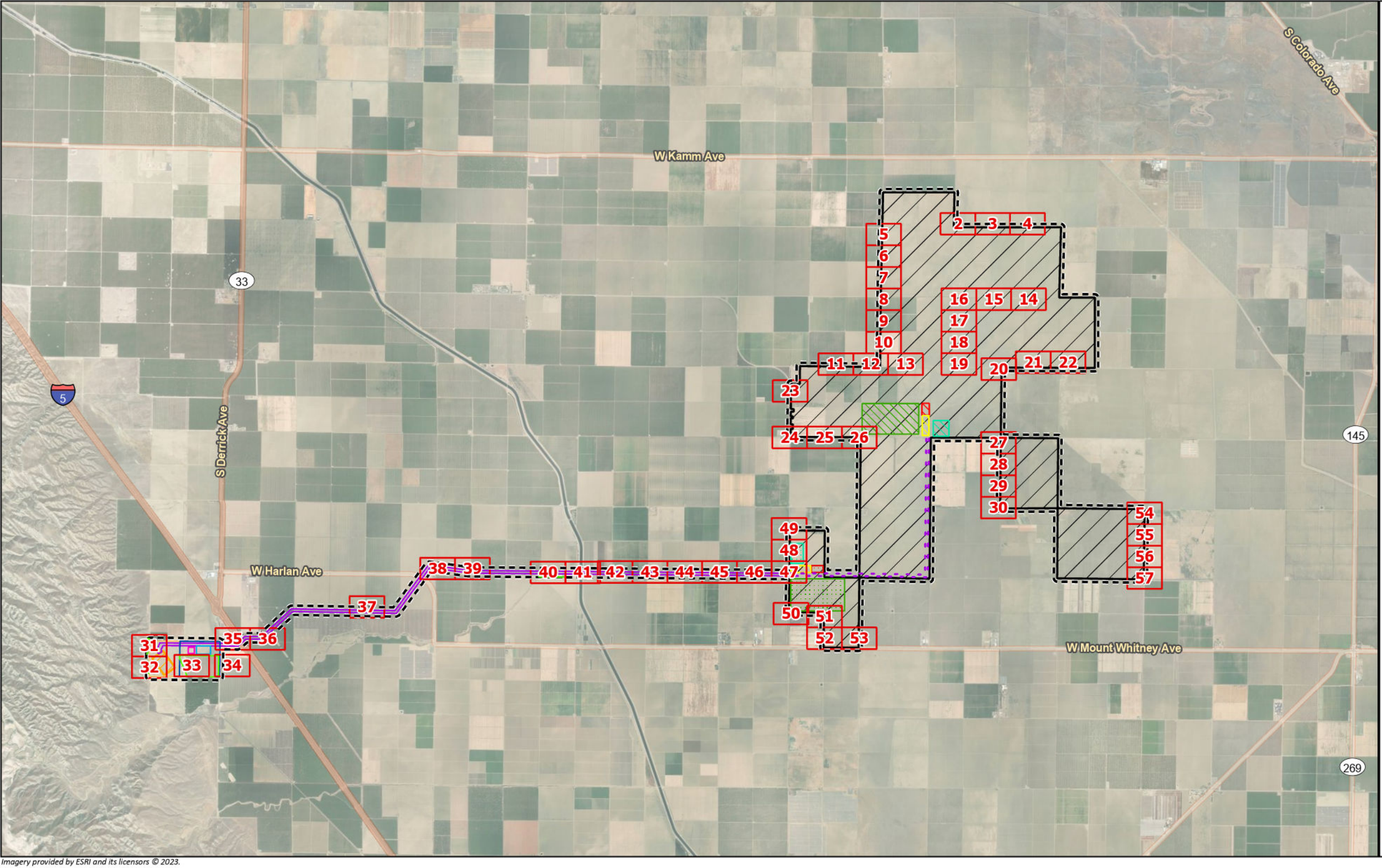
Photo 8. SWHA Nest Tree (SH17; see table in Attachment C). Willow tree in Fresno Slough approximately 800 feet south of W Cerini Ave extension. Photo taken May 2023.

Photo 9. SWHA Nest Tree (SH18; see table in Attachment C). Eucalyptus tree in an industrial yard at McKean Farms, W Mt. Whitney Ave. Photo taken May 2023.

Photo 10. SWHA Nest Tree (SH39; see table in Attachment C). Pine tree in residential property along W Clarkson Ave; East side of Cantua Creek. Photo taken May 2023.

Appendix Q-9

Aquatic Resources Delineation



Darden Clean Energy Project

Fresno County, California

- 1 — Mapbook Page
- Jurisdictional Study Area (250-Foot Buffer)

Jurisdictional Features

- CDFW - Streambed
- RWQCB - Non Wetland Waters of the State

Project Components

- Solar Facility
- Utility Switchyard
- Utility Switchyard Parcel
- Gen-Tie Line ROW

Option 1

- BESS
- Green Hydrogen Facility
- O&M Facilities
- Step-Up Substation
- Gen-Tie Line ROW Extension

Option 2

- BESS
- Green Hydrogen Facility
- O&M Facilities
- Step-Up Substation

Alternate Green Hydrogen Site

- Green Hydrogen Facility
- Green Hydrogen Substation
- Green Hydrogen Switchyard
- Green Hydrogen Parcels

0 0.75 1.5 Miles

N

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers

22-12530 JD
Fig X JD_Overview

Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

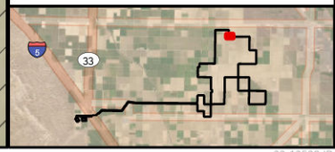
Project Components

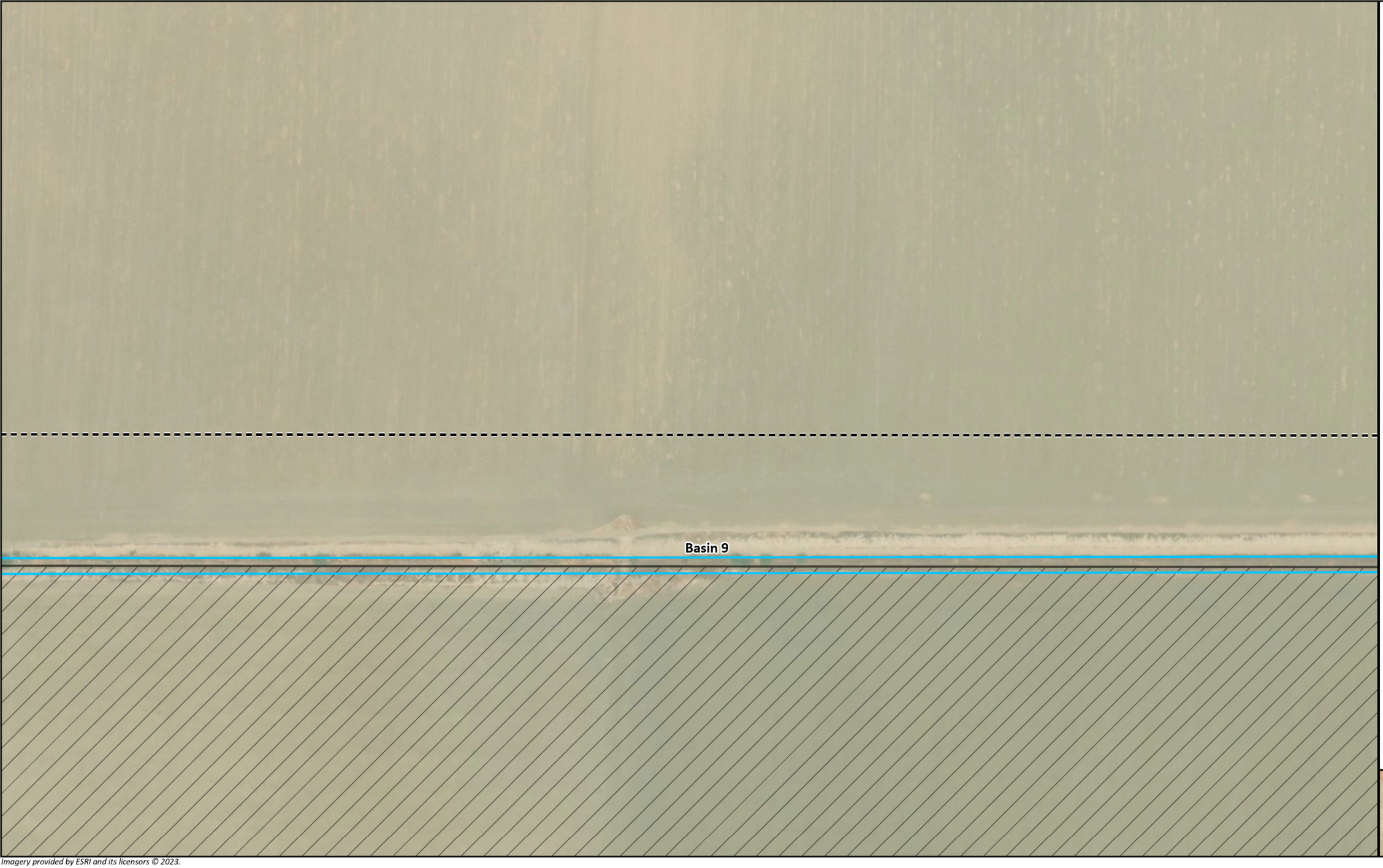
Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers





Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

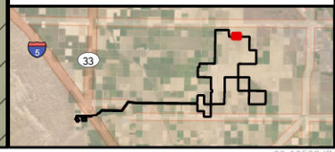
Project Components

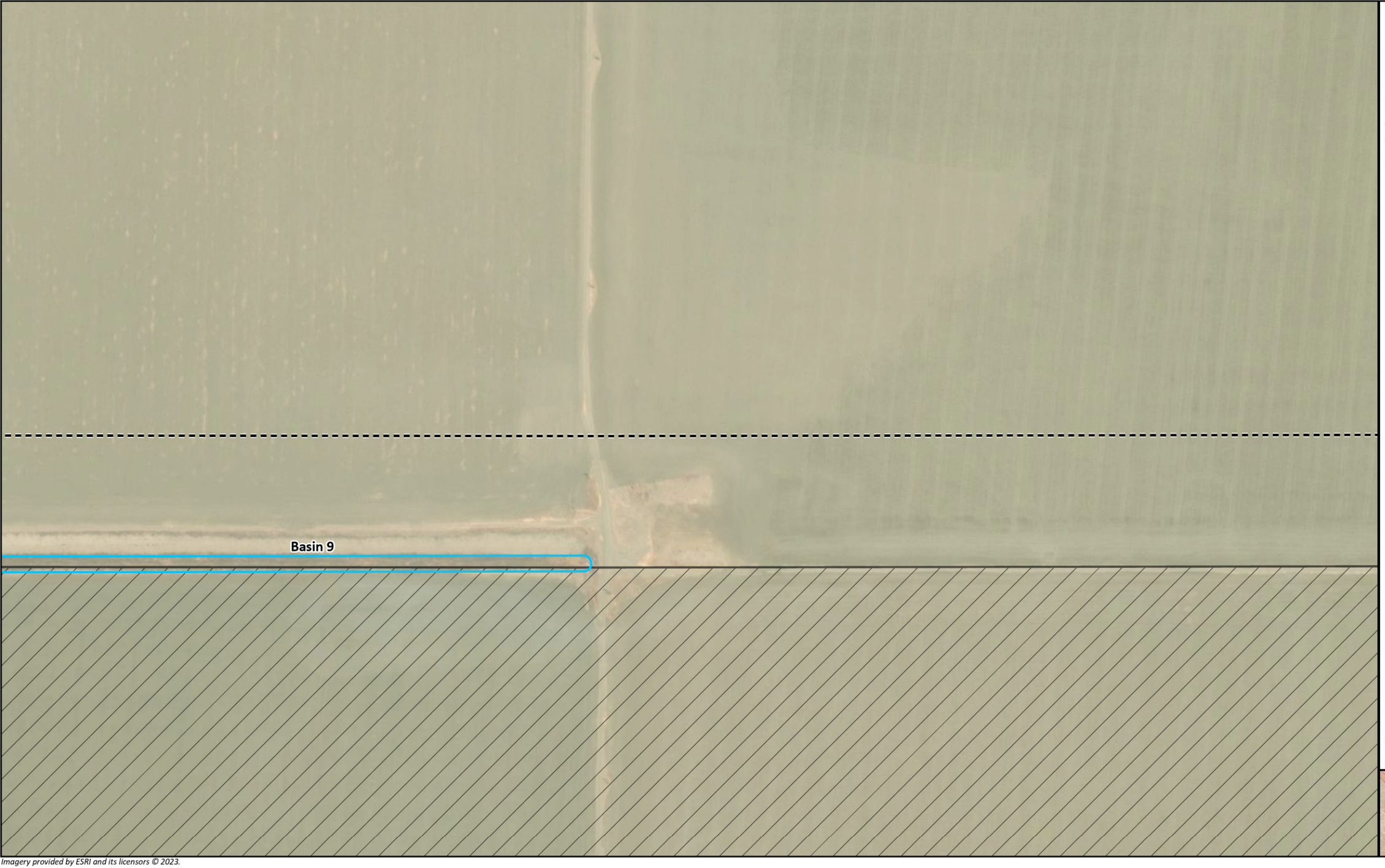
Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers





Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

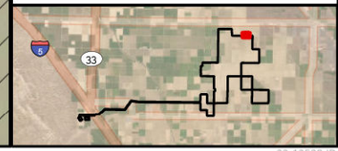
Project Components

Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers



22-12530 JD
Fig X JD

Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

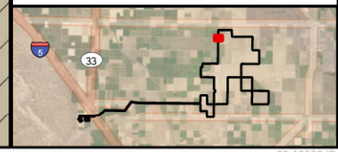
Project Components

Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers



22-12530 JD
Fig X JD

Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

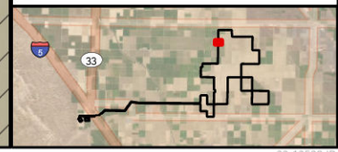
Project Components

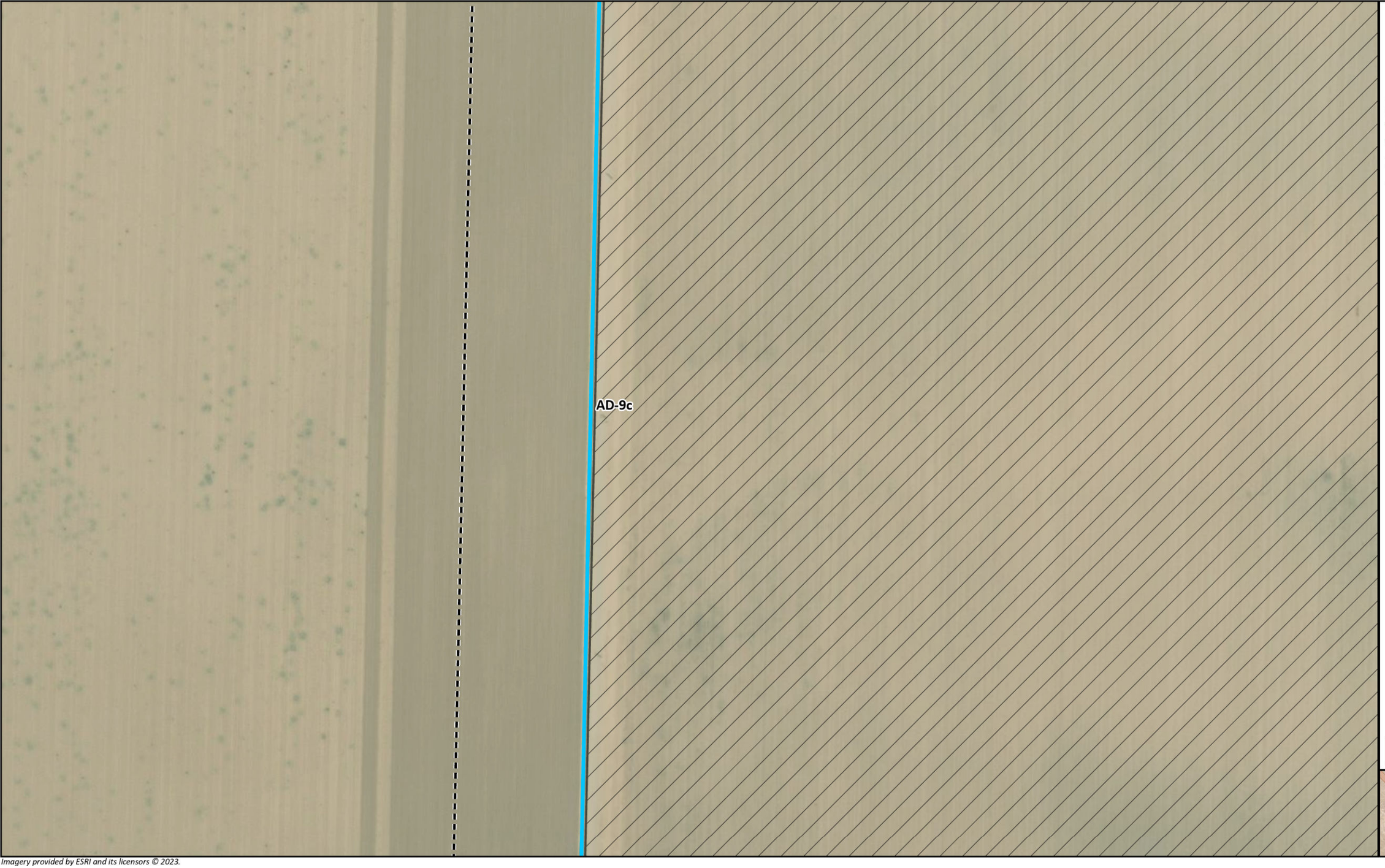
Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers





Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

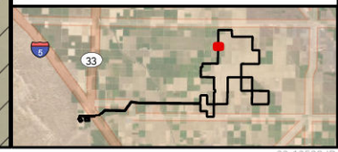
Project Components

Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers



Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

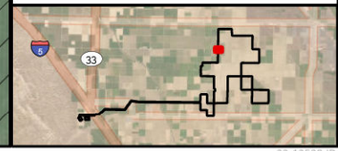
Project Components

Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers



22-12530 JD
Fig X JD

Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

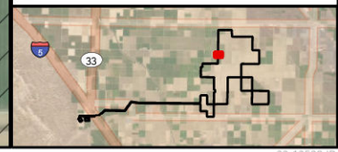
Project Components

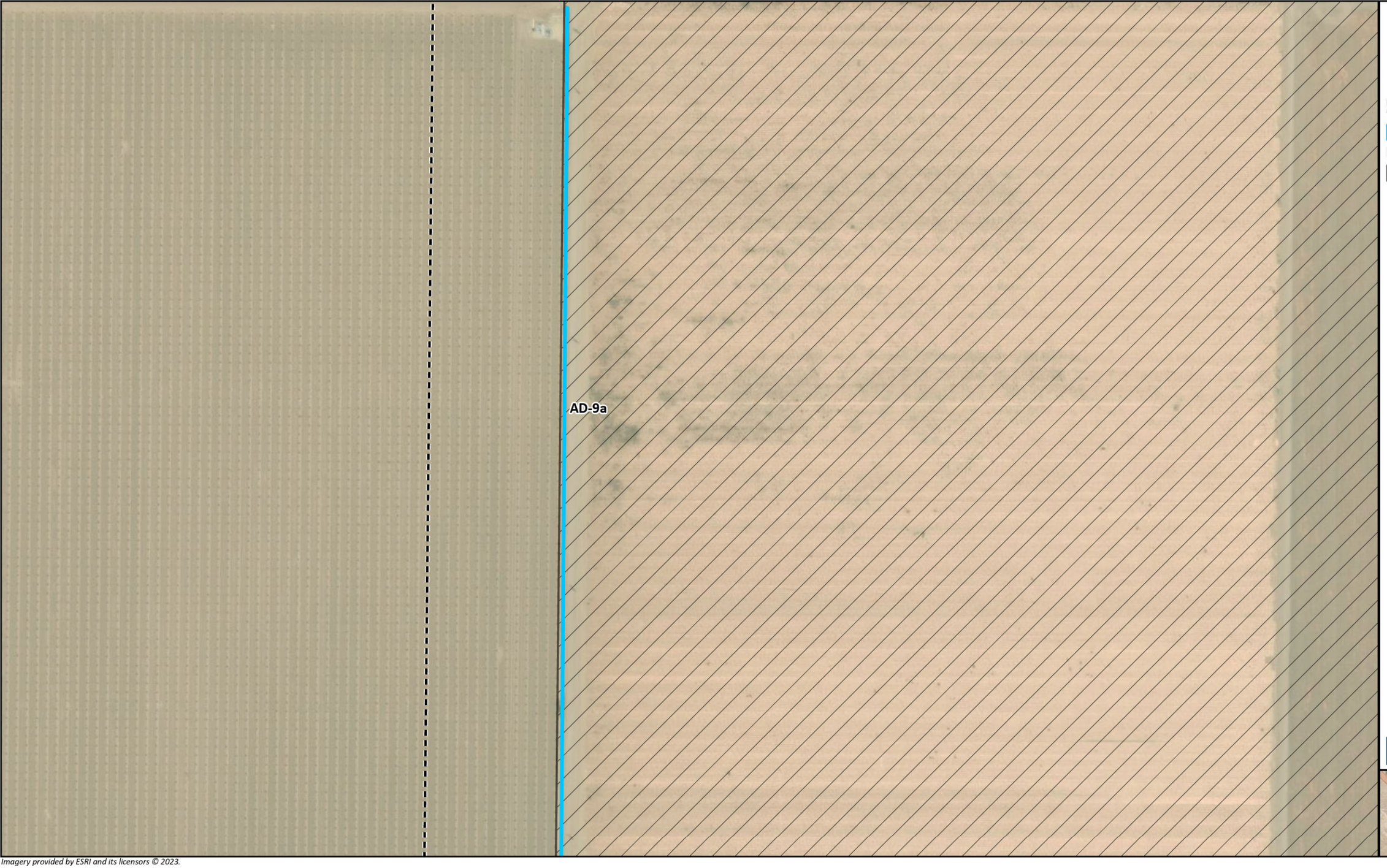
Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers





Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

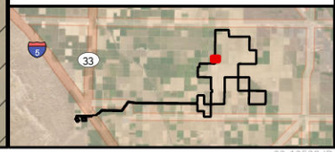
Project Components

Solar Facility

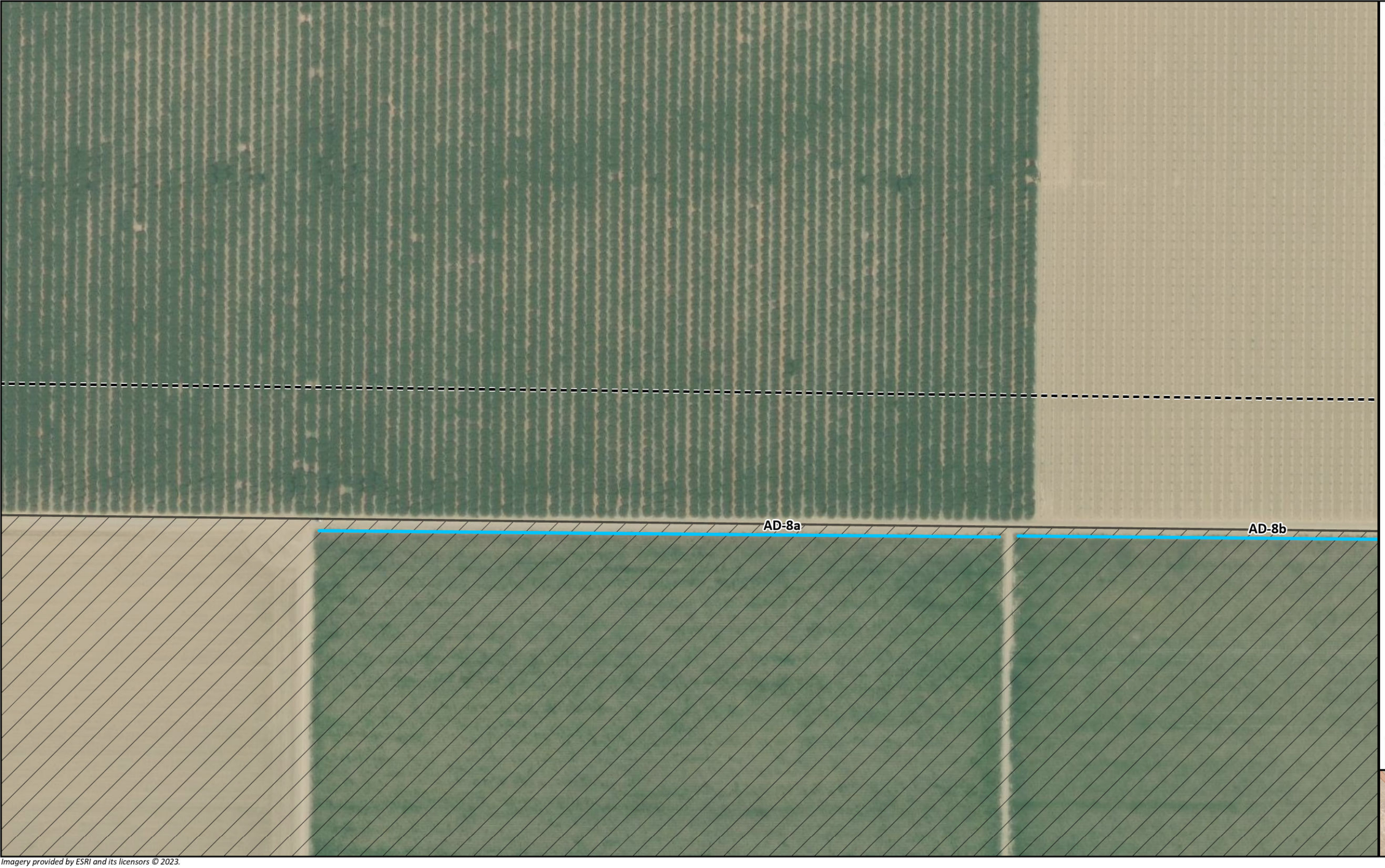
0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers



22-12530 JD
Fig X JD



Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

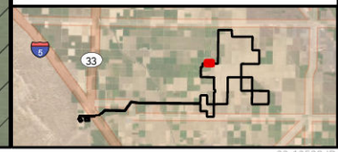
Project Components

Solar Facility

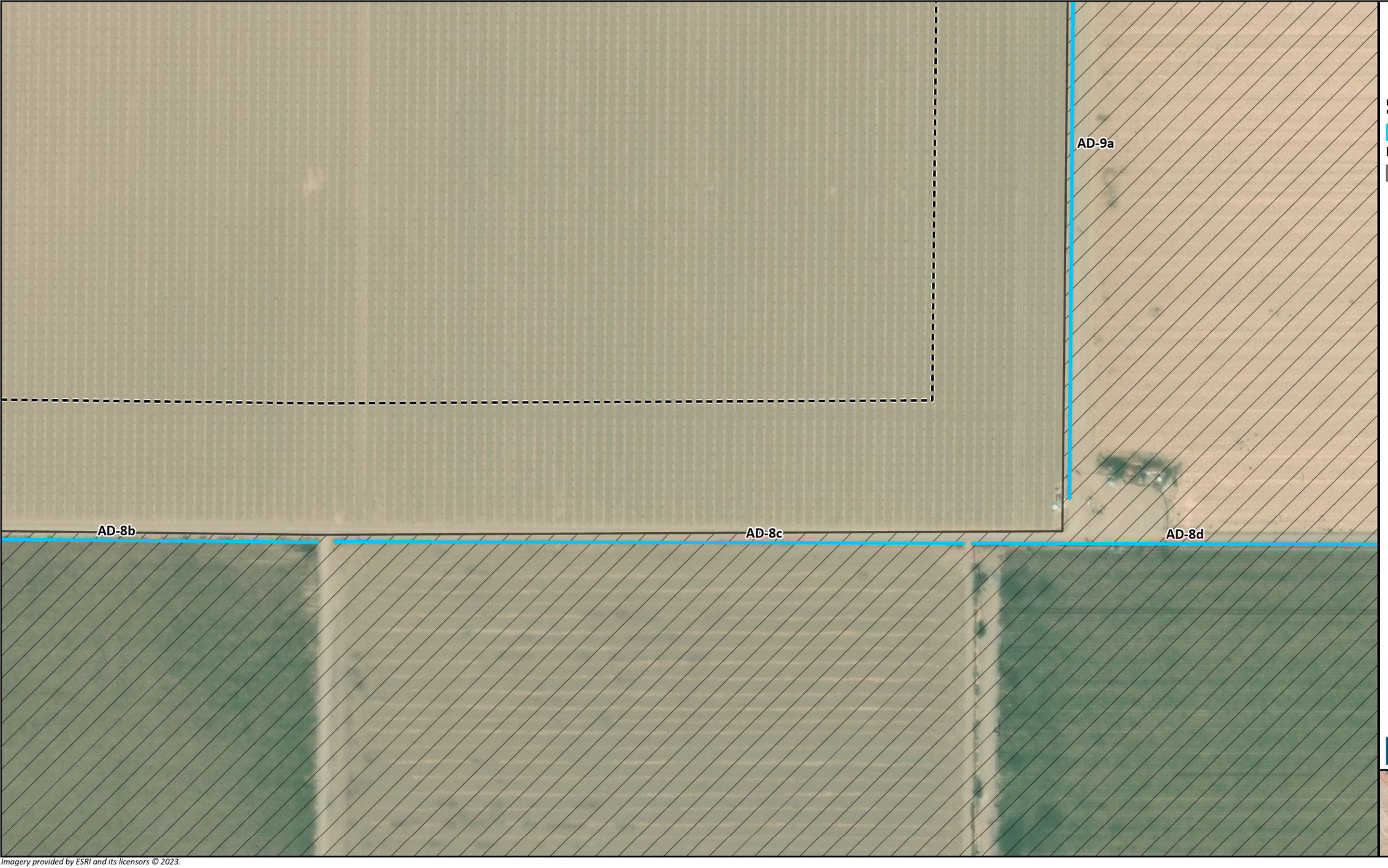
0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers



22-12530 JD
Fig X JD



Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

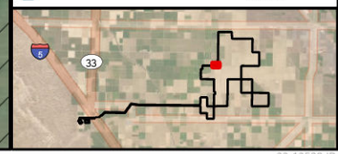
Project Components

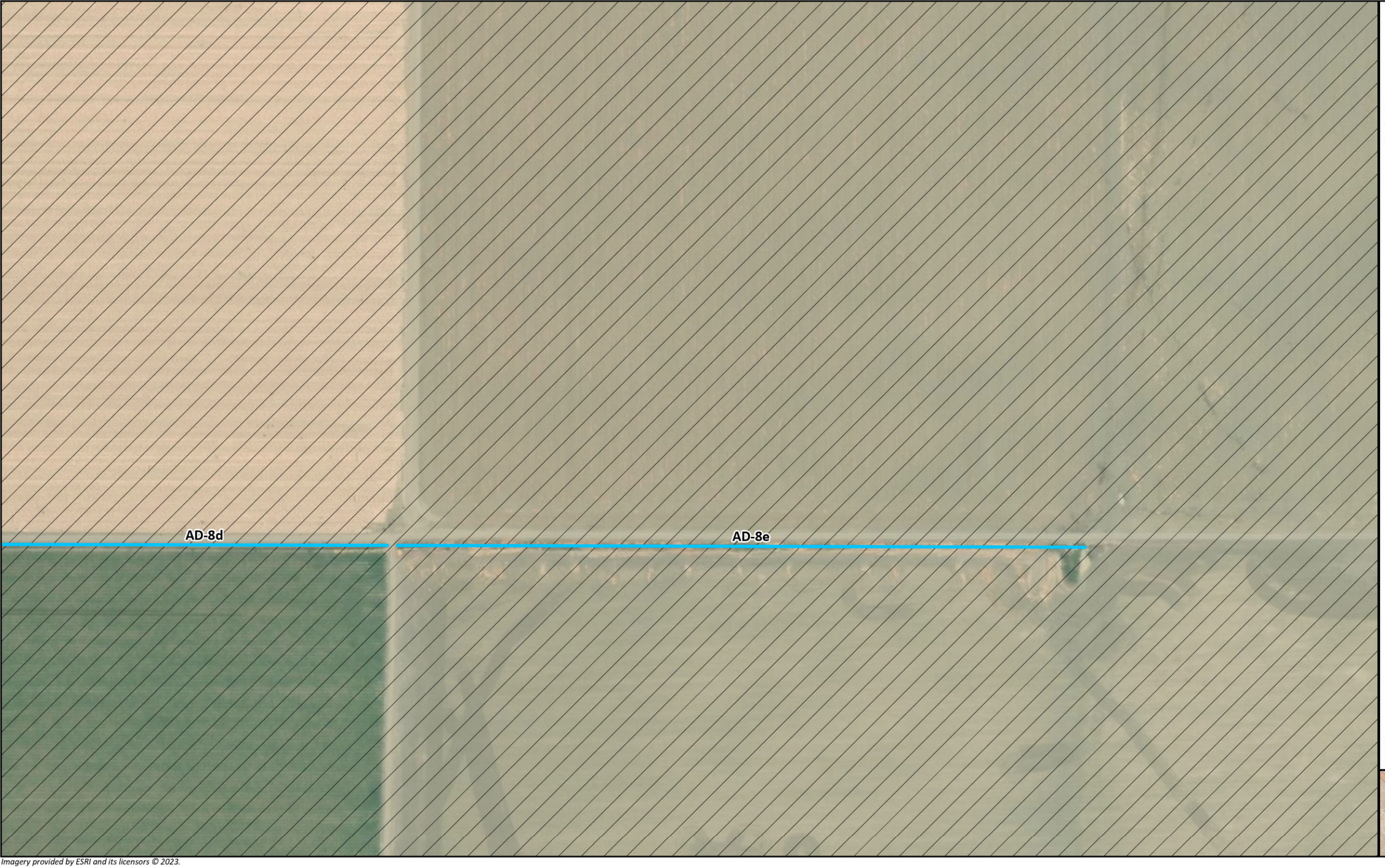
Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers





Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

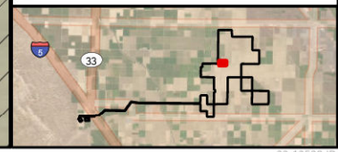
Project Components

Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers



22-12530 JD
Fig X JD

Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

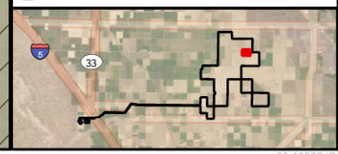
Project Components

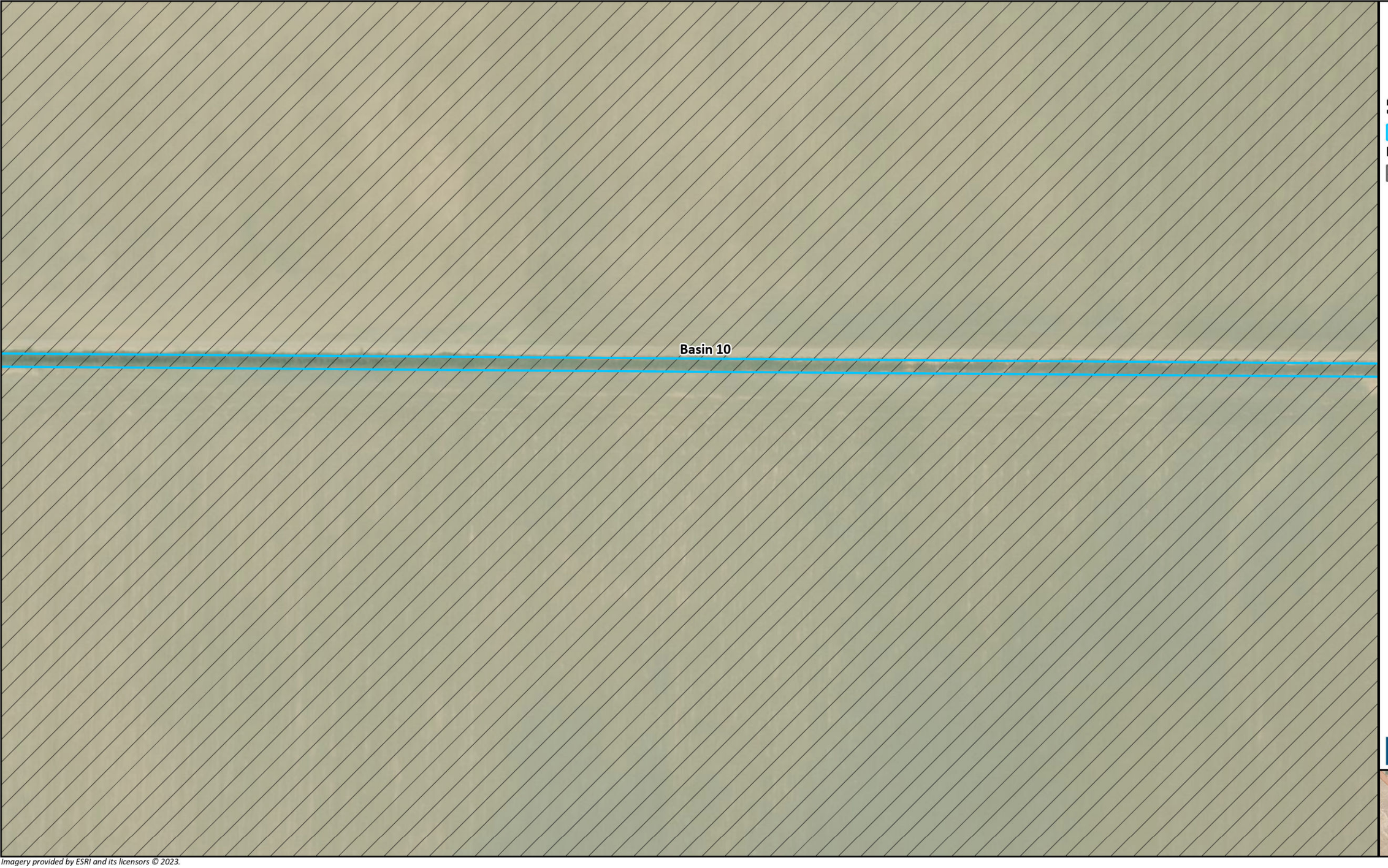
Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers





Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

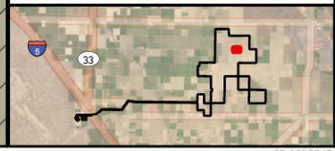
Project Components

Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers



22-12530 JD
Fig X JD

Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

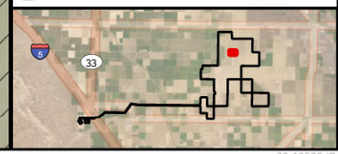
Project Components

Solar Facility

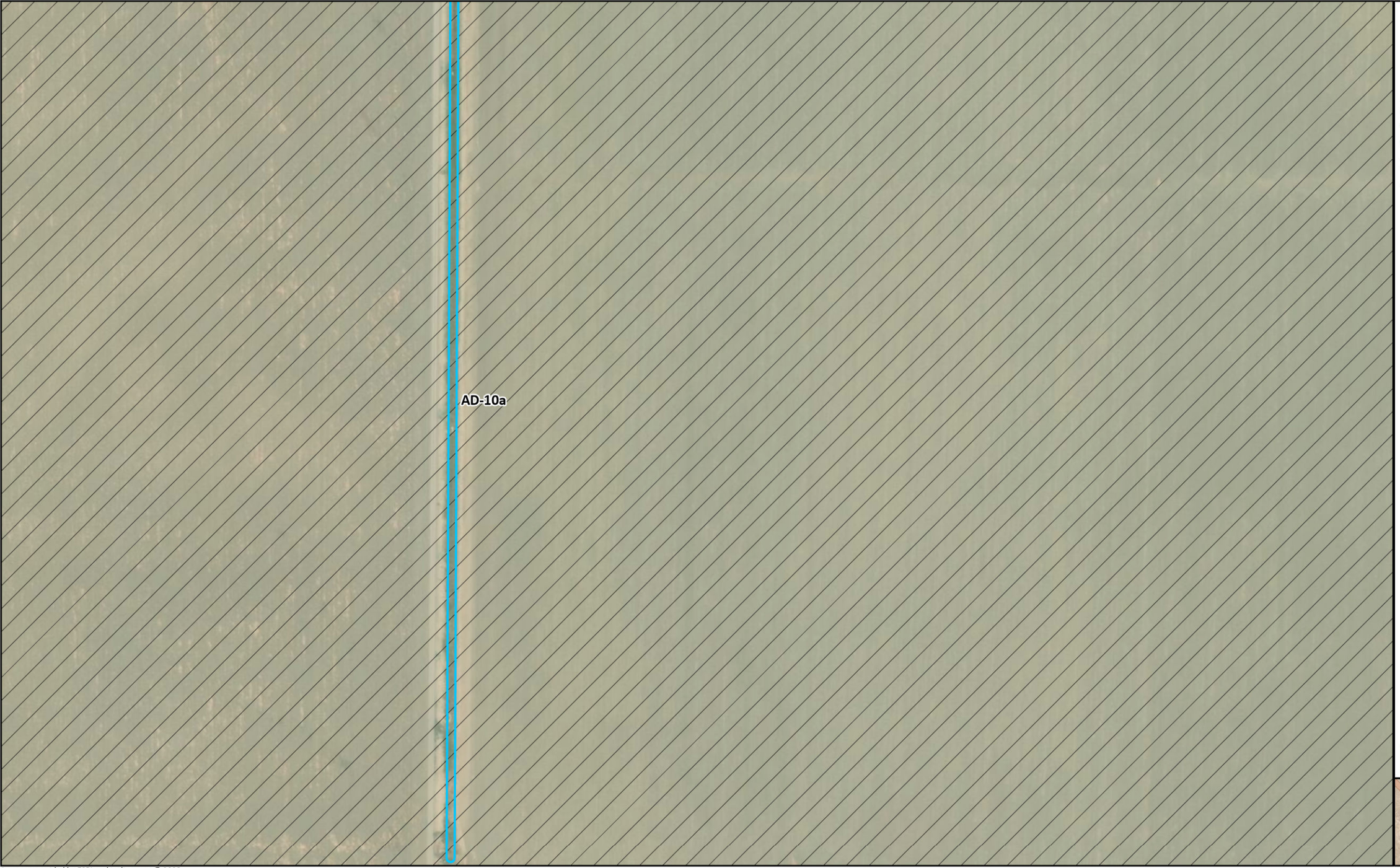
0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers



22-12530 JD
Fig X JD



Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

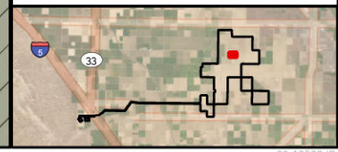
Project Components

Solar Facility

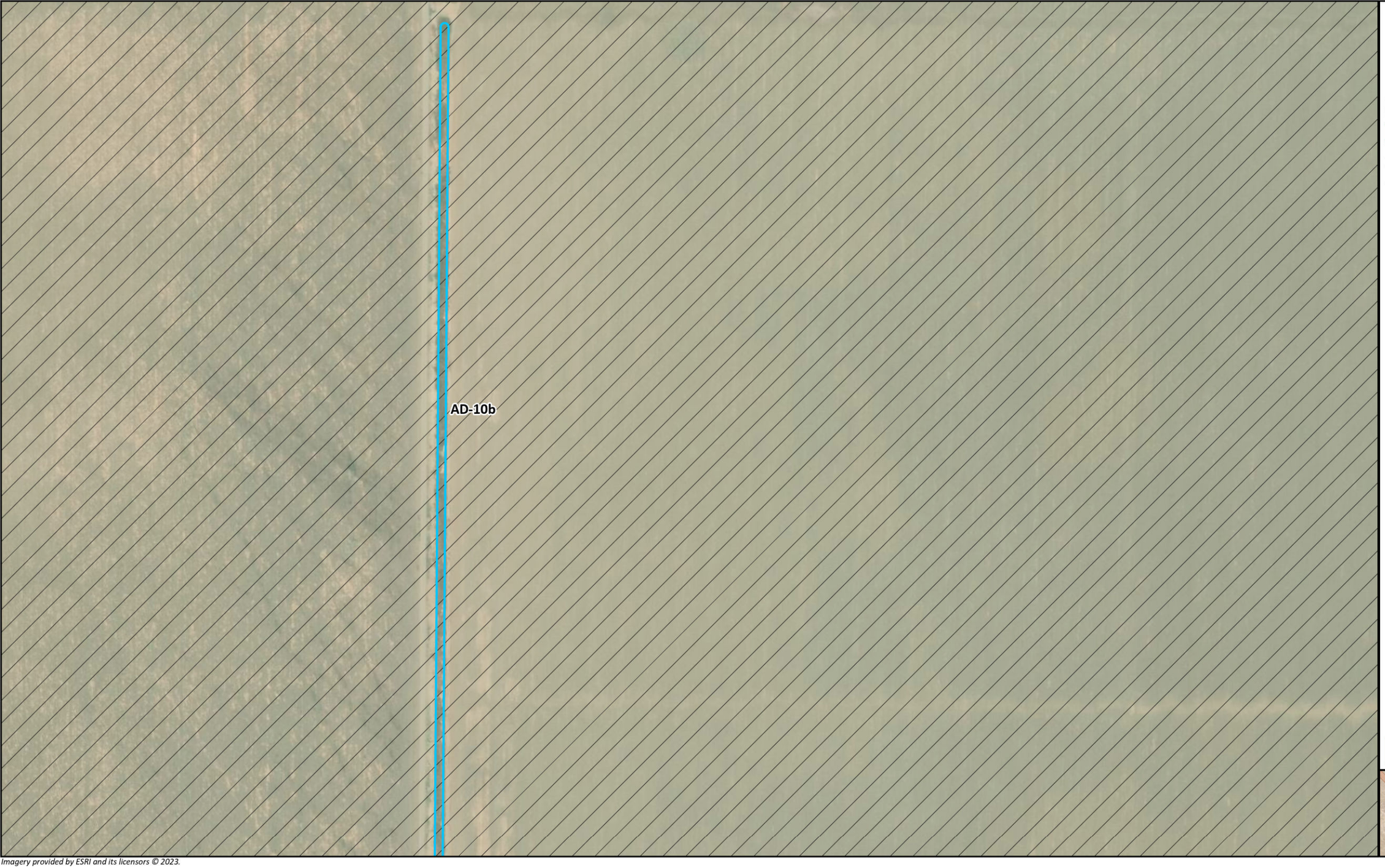
0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers



22-12530 JD
Fig X JD



Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

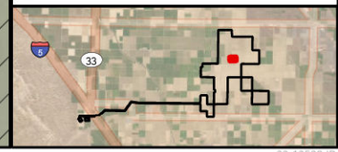
Project Components

Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers



22-12530 JD
Fig X JD

Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

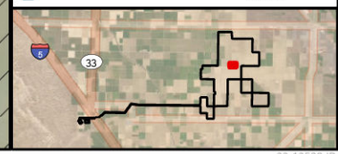
Project Components

Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers



Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

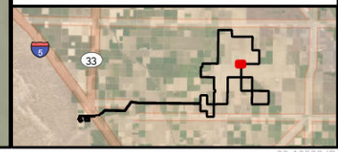
Project Components

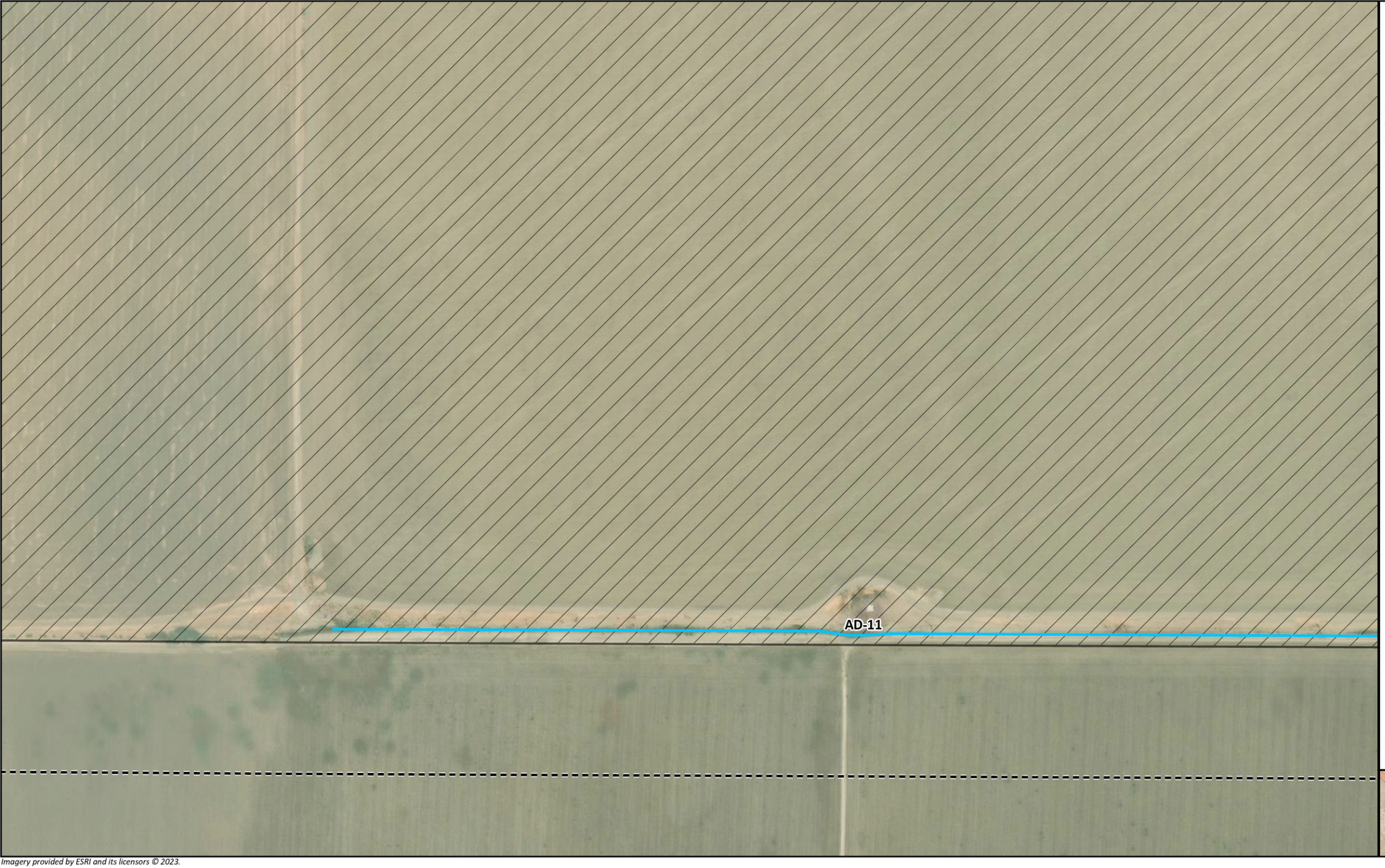
Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers





Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

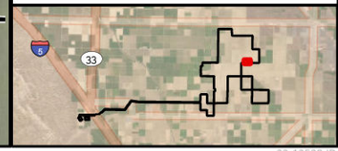
Project Components

Solar Facility

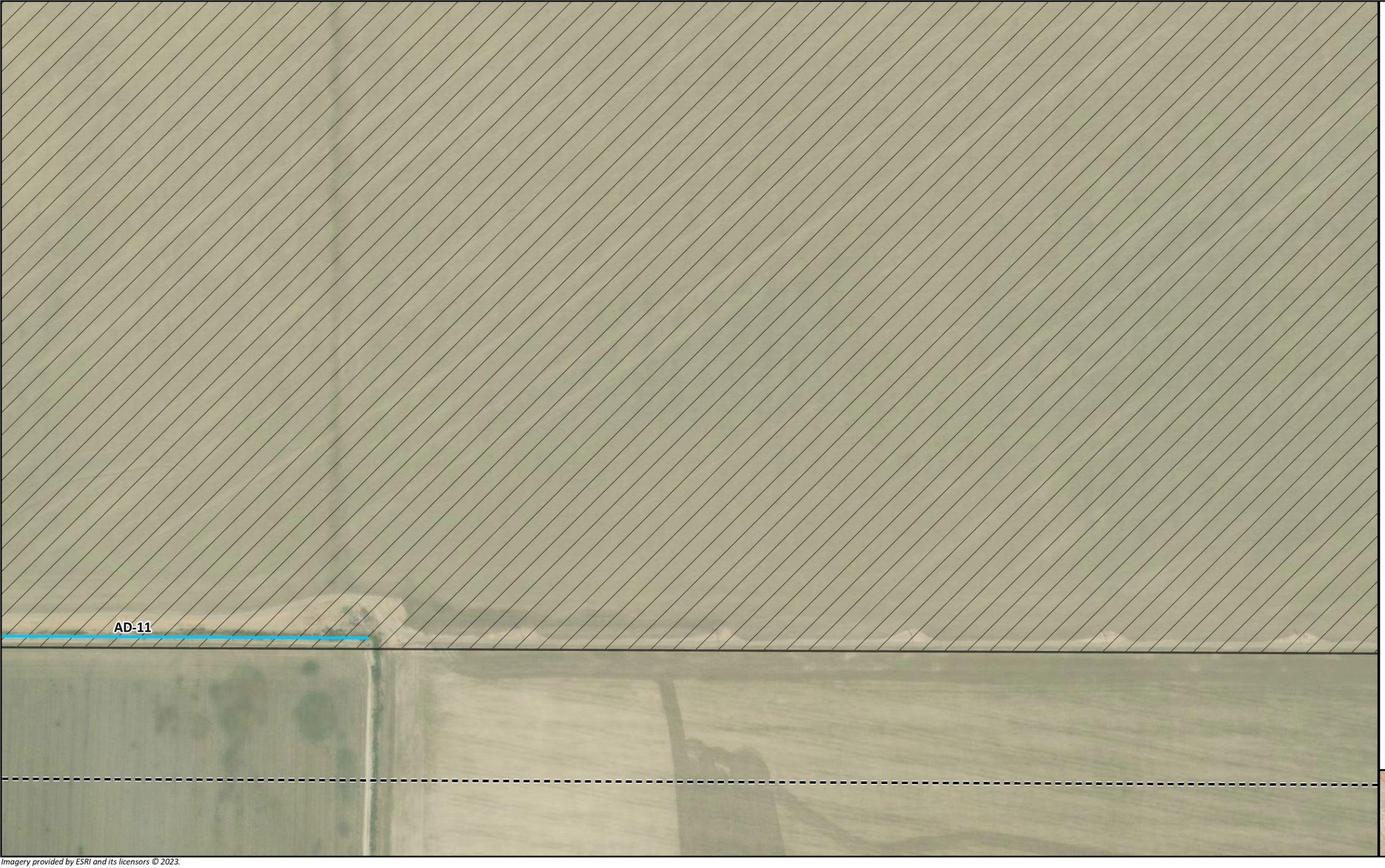
0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers



22-12530 JD
Fig X JD



Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

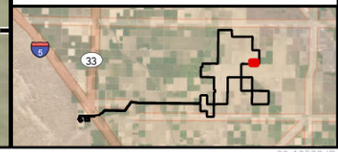
Project Components

Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers



Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

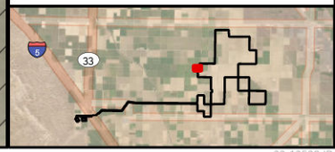
Project Components

Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers



Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

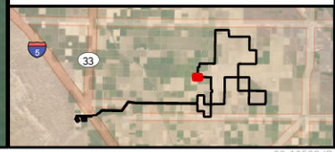
Project Components

Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers



22-12530 JD
Fig X JD

Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

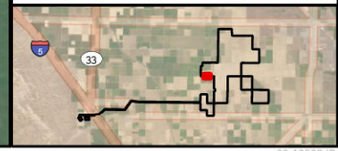
Project Components

Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers



22-12530 JD
Fig X JD

Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

Project Components

Solar Facility

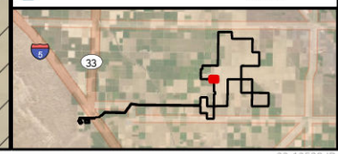
Option 1

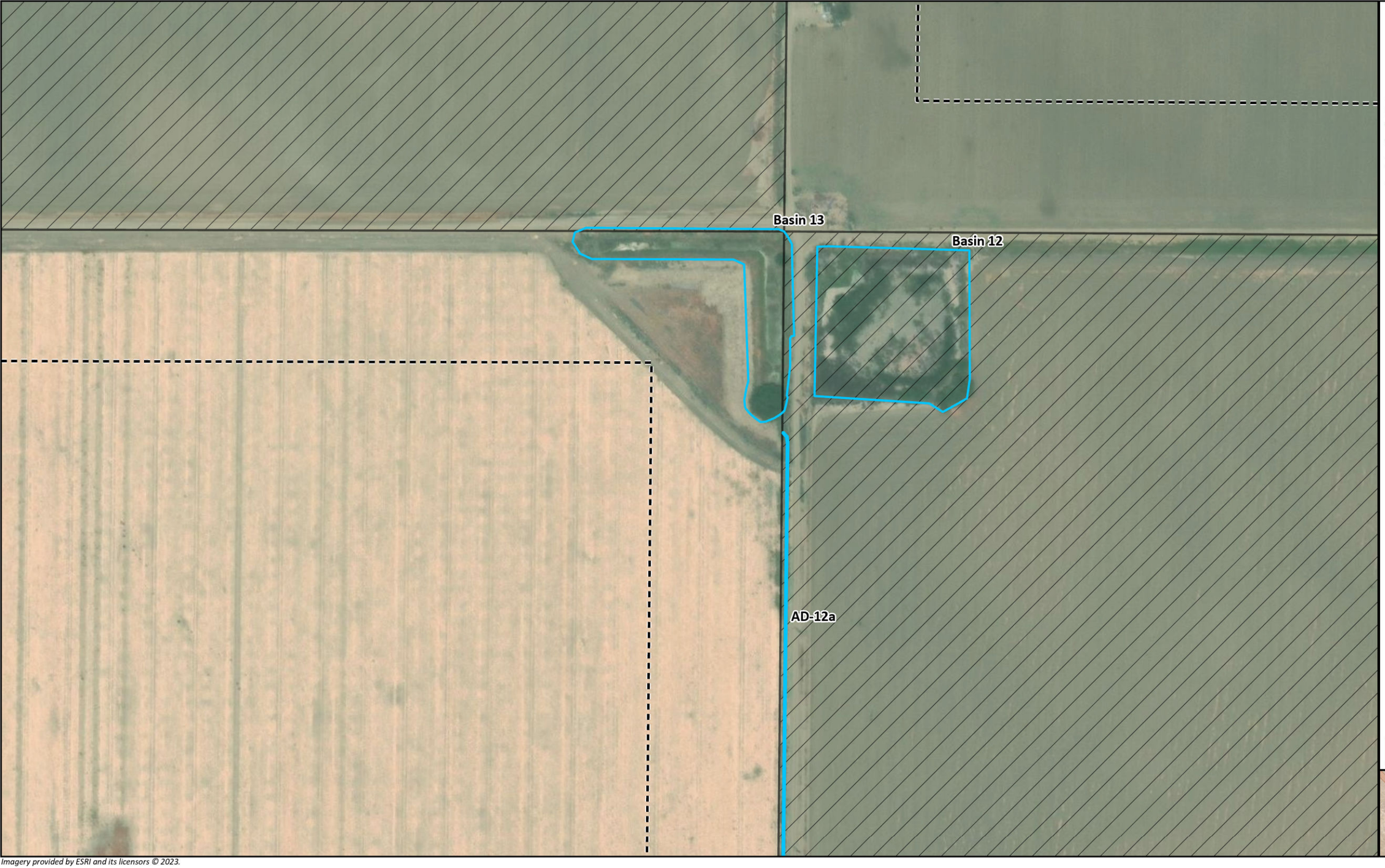
Green Hydrogen Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers





Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

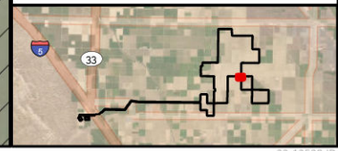
Project Components

Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers



22-12530 JD
Fig X JD

Darden Clean Energy Project

Fresno County, California

Jurisdictional Study Area (250-Foot Buffer)

Non-Jurisdictional Feature

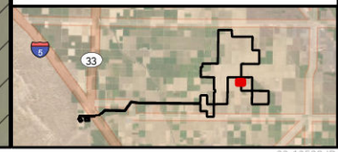
Project Components

Solar Facility

0 100 200 N

Feet

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers



22-12530 JD
Fig X JD