Appendix E1
Habitat Characterization Report

TETRA TECH

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Subject: **Habitat Characterization Report, Proposed Janus Solar Project, Colusa County, California**

Dear Ms. Goetze:

This letter report presents findings of Tetra Tech's habitat characterization field survey for natural resources in support of the environmental permitting process at the proposed Janus Solar Project Site (the Site) for the Janus Solar Project in Colusa County, California. Previously, Stantec Consulting Services Inc. conducted a preliminary desktop analysis of potential biological resources present at the Site; Tetra Tech also conducted a desktop analysis and literature review prior to the biological Site visit. The purpose of the field survey was to verify desktop analysis findings of both Stantec and Tetra Tech, provide a coarse scale vegetation map, and determine additional special/protocol level studies or surveys that are needed. This report summarizes the habitat characterization survey results.

The Site is located on private property in an area of Colusa County primarily used for cattle grazing and is approximately 967.2 acres (Figure 1 and 2 [all figures are included in Attachment 1]). The Site includes three parcels with Assessor Parcel Numbers 018-050-005-000, 018-050-006-000, and 018-050-013-000. The Site excludes the Favero Retained Area (approximately 56 acres) but includes the Favero Corral Area (approximately 41 acres). The Project would connect to the Cortina Substation which is located on Walnut Drive, approximately 2 miles northeast of the Site.

METHODS

A literature and data review of pertinent background information for the Site was completed, which included the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) data (CDFW 2019), U.S. Geological Survey (USGS) topographic maps, California Native Plant Society Inventory of Rare and Endangered Plants (CNPS) data (CNPS 2019), available aerial imagery (Google Earth Pro 2018, Google Maps 2019), National Wetlands Inventory (NWI) data (U.S. Fish and Wildlife Service [USFWS] 2019), United States Department of Agriculture (USDA) soils data (USDA 2019), and the *Janus Solar Project – Foothill Agriculture Site Critical Issues Analysis Memo* prepared by Stantec (Stantec 2018). The literature review determined the special-status species known to occur or that could potentially occur in the region, as well as the location of designated critical habitat and potential wetlands. Special-status species are defined herein as plants and wildlife holding a status of sensitive, threatened, endangered, rare, or candidate status as defined by CDFW, USFWS, CNPS, or the Bureau of Land Management.

The special-status species presented in Table 1 are those with any chance of potentially occurring within or adjacent to the Site based on regional occurrence and habitat present on the Site (CDFW 2019, CNPS 2019). The Site falls within the Salt Canyon quadrangle, therefore a search containing this quadrangle and the eight surrounding quadrangles (9-quad search) was conducted to fully capture any species with potential to occur. One special-status plant species has a high potential to occur on Site and two plant species have a moderate potential to occur; one special-status wildlife species has a high potential to occur on Site, six have a moderate potential to occur on Site, and two wildlife species were observed during the field spot check.

Table 1: Special-status Species with Potential to Occur on Site

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Habitat	Potential to Occur
Plants					
Acmispon rubriflorus	red-flowered bird's-foot trefoil	None	None/1B.1	Cismontane woodland, Valley and foothill grassland	**Low**. Site contained primarily non-native grasslands and is actively grazed. A lack of native habitat was present, therefore potential to occur is low.
Amsinckia lunaris	bent-flowered fiddleneck	None	None/1B.2	Cismontane woodland, Coastal bluff scrub, Valley and foothill grassland	**Low**. While there are four known occurrences within the Salt Canyon quadrangle, the Site contained primarily non-native grasslands and is actively grazed. A lack of native habitat was present, therefore potential to occur is low.
Astragalus breweri	Brewer's milk-vetch	None	None/4.2	Chaparral, Cismontane woodland, Meadows and seeps, Valley and foothill grassland (open, often gravelly)	**Low**. Site contained primarily non-native grasslands and is actively grazed. A lack of native habitat was present, therefore potential to occur is low.
Astragalus tener var. *ferrisiae*	Ferris' milk-vetch	None	None/1B.1	Meadow and seep, Valley and foothill grassland, Wetland	**Low.** While this species is known to occur within 5 miles of the Site, suitable grassland and wetland habitat on Site was highly disturbed due to consistent active

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Habitat	Potential to Occur
					grazing. Therefore, potential to occur is low.
Atriplex depressa	brittlescale	None	None/1B.2	Alkali playa, Chenopod scrub, Meadow and seep, Valley and foothill grassland, Vernal pool, Wetland	**Low.** Suitable grassland and wetland habitat on Site were highly disturbed due to consistent active grazing. Therefore, potential to occur is low.
Balsamorhiza macrolepis	big-scale balsamroot	None	None/1B.2	Chaparral, Cismontane woodland, Ultramafic[1], Valley and foothill grassland	**Low**. Site contained primarily non-native grasslands and is actively grazed. A lack of native habitat was present, therefore potential to occur is low.
Calystegia collina ssp. *tridactylosa*	three-fingered morning-glory	None	None/1B.2	Chaparral, Cismontane woodland, Ultramafic	**Low.** Preferred suitable habitat was not present on Site. Therefore, potential to occur is low.
Castilleja rubicundula var. *rubicundula*	pink creamsacs	None	None/1B.2	Chaparral, Cismontane woodland, Meadow and seep, Ultramafic, Valley and foothill grassland	**Low**. While there is one known occurrence within the Salt Canyon quadrangle, the Site contained primarily non-native grasslands/disturbed drainages and is actively grazed. A lack of native habitat was present, therefore potential to occur is low.
Centromadia parryi ssp. *parryi*	pappose tarplant	None	None/1B.2	Chaparral, Coastal prairie, Marsh and swamp, Meadow and seep, Valley	**High.** There is one known occurrence within the Salt Canyon quadrangle. While a lack of native

[1] Ultramafic is a geologic term used to define a type of rock with very low silica content and rich in minerals such as hypersthene, augite, and olivine (Geoscience News and Information 2019).

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Habitat	Potential to Occur
				and foothill grassland	habitat is present throughout the Site, this species can persist in disturbed areas. A dried-up population of *Centromadia* sp. was identified during the field spot check. Therefore, potential to occur is high.
Centromadia parryi ssp. *rudis*	Parry's rough tarplant	None	None/4.2	Valley and foothill grassland, Vernal pools	**Moderate.** While A lack of native habitat is present throughout the Site, this species can persist in disturbed areas. Unlike pappose tarplant, there is not a known occurrence of this species within the Salt Canyon quadrangle, therefore, potential to occur is moderate.
Cryptantha rostellata	red-stemmed cryptantha	None	None/4.2	Cismontane woodland, Valley and foothill grassland	**Low.** Suitable grassland habitat on Site consisted of primarily non-native species and was highly disturbed due to consistent active grazing. Therefore, potential to occur is low.
Delphinium recurvatum	recurved larkspur	None	None/1B.2	Chenopod scrub, Cismontane woodland, Valley and foothill grassland	**Low.** Suitable grassland habitat on Site consisted of primarily non-native species and was highly disturbed due to consistent active grazing. Therefore, potential to occur is low.

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Habitat	Potential to Occur
Extriplex joaquinana	San Joaquin spearscale	None	None/1B.2	Alkali playa, Chenopod scrub, Meadow and seep, Valley and foothill grassland	**Low**. While there is one known occurrence within the Salt Canyon quadrangle, the Site contained primarily non-native grasslands/ disturbed drainages and is actively grazed. A lack of native habitat was present, therefore potential to occur is low.
Fritillaria pluriflora	adobe-lily	None	None/1B.2	Chaparral, Cismontane woodland, Ultramafic, Valley and foothill grassland	**Moderate**. There are five known occurrences within the Salt Canyon quadrangle, and although the Site is disturbed due to active grazing, preferred clay soils are present throughout (USDA 2019). Therefore, potential to occur is moderate.
Hesperolinon bicarpellatum	two-carpellate western flax	None	None/1B.2	Chaparral, Ultramafic	**Low.** Preferred suitable habitat was not present on Site. Therefore, potential to occur is low.
Hesperolinon drymarioides	drymaria-like western flax	None	None/1B.2	Chaparral, Cismontane woodland, Closed-cone coniferous forest, Ultramafic, Valley and foothill grassland	**Low.** Suitable grassland habitat on Site consisted of primarily non-native species and was highly disturbed due to consistent active grazing. Therefore, potential to occur is low.
Heteranthera dubia	water star-grass	None	None/2B.2	Marsh and swamp	**Low.** While standing water and drainage features were observed within the Site, marsh and swamp habitat

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					was not present. Therefore, potential to occur is low.
Horkelia bolanderi	Bolander's horkelia	None	None/1B.2	Cismontane woodland, Lower montane coniferous forest, Meadow and seep, Valley and foothill grassland	**Low**. While there is one known occurrence within the Salt Canyon quadrangle, the Site contained primarily non-native grasslands/disturbed drainages and is actively grazed. A lack of native habitat was present, therefore potential to occur is low.
Layia septentrionalis	Colusa layia	None	None/1B.2	Chaparral, Cismontane woodland, Ultramafic, Valley and foothill grassland	**Low.** Suitable grassland habitat on Site consisted of primarily non-native species and was highly disturbed due to consistent active grazing. Therefore, potential to occur is low.
Micropus amphibolus	Mt. Diablo cottonweed	None	None/3.2	Broad-leafed upland forest, Chaparral, Cismontane woodland, Valley and foothill grassland	**Low.** Suitable grassland habitat on Site consisted of primarily non-native species and was highly disturbed due to consistent active grazing. Therefore, potential to occur is low.
Myosurus minimus ssp. *apus*	little mousetail	None	None/3.1	Valley and foothill grassland, Vernal pools (alkaline)	**Low.** Suitable grassland habitat on Site consisted of primarily non-native species and is was highly disturbed due to consistent active grazing. Therefore, potential to occur is low.

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Habitat	Potential to Occur
Navarretia leucocephala ssp. *bakeri*	Baker's navarretia	None	None/1B.1	Cismontane woodland, Lower montane coniferous forest, Meadow and seep, Valley and foothill grassland, Vernal pool, Wetland	**Low.** Suitable grassland and wetland habitat on Site were highly disturbed due to consistent active grazing. Therefore, potential to occur is low.
Navarretia nigelliformis ssp. nigelliformis	adobe navarretia	None	None/4.2	Valley and foothill grassland vernally mesic, Vernal pools sometimes	**Low.** While there are four known occurrences within the Salt Canyon quadrangle, the Site contained primarily non-native grasslands/disturbed potential wetland areas and is actively grazed. A lack of native habitat was present, therefore potential to occur is low.
Navarretia nigelliformis ssp. *radians*	shining navarretia	None	None/1B.2	Cismontane woodland, Valley and foothill grassland, Vernal pool, Wetland	**Low**. The Site contained primarily non-native grasslands. Potential wetland areas were highly disturbed due to consistent active grazing. A lack of native habitat was present, therefore potential to occur is low.
Plagiobryoides vinosula	wine-colored tufa moss	None	None/4.2	Cismontane woodland, Mojavean desert scrub, Meadows and seeps, Pinyon and juniper woodland, Riparian woodland	**Low.** Riparian woodland tree species were low in numbers and in disturbed areas. Suitable habitat on Site was highly disturbed due to consistent active grazing. Therefore, potential to occur is low.

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Puccinellia simplex	California alkali grass	None	None/1B.2	Chenopod scrub, Meadow and seep, Valley and foothill grassland, Vernal pool	**Low.** Suitable grassland and wetland habitat on Site were highly disturbed due to consistent active grazing. Therefore, potential to occur is low.
Sidalcea keckii	Keck's checkerbloom	Endangered	None/1B.1	Cismontane woodland, Ultramafic, Valley and foothill grassland	**Low**. While there is one known occurrence within the Salt Canyon quadrangle, the Site contained primarily non-native grasslands and is actively grazed. A lack of native habitat was present, therefore potential to occur is low.
Birds					
Accipiter cooperii	Cooper's hawk	None	None/WL	Woodland, chiefly of open, interrupted or marginal type.	**Low.** Some perching and foraging habitat available on Site, however limited nesting sites and disturbed woodland habitat present. Therefore, potential to occur is low.
Agelaius tricolor	tricolored blackbird	None	Threatened/ S, SSC, BCC	Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California.	**Low.** Preferred vast marshland habitat suitable to colonies not present on Site. Therefore, potential to occur is low.
Aquila chrysaetos	golden eagle	None	None/S, FP, WL, BCC	Rolling foothills, mountain areas, sage-juniper flats, and desert.	**Low.** The Site is highly disturbed due to consistent active grazing, and preferred habitat is not present. Therefore, potential to occur is low.

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Habitat	Potential to Occur
Athene cunicularia	burrowing owl	None	None/S, SSC, BCC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation.	**Moderate.** The Site is highly disturbed by active cattle grazing, few patches of preferred unvegetated soils occurred, and no burrows of suitable size were observed during the field spot check; the few ground squirrel burrows observed did not meet the >11cm in diameter and >150cm in depth criteria. The nearest CNDDB occurrence is approximately 2 miles from the Site. Therefore, potential to occur is moderate.
Buteo swainsoni	Swainson's hawk	None	Threatened/ S, BCC	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees.	**High.** Foraging habitat and the preferred nesting habitat of solitary or small groves of trees near agricultural fields is present on Site (The Cornell Lab 2019). Therefore, potential to occur is high.
Circus hudsonius	northern harrier	None	None/SSC	Wetlands, grasslands, fields, estuaries, open floodplain, and marshes (The Cornell Lab 2019).	**Observed.** While this species did not appear in the CNDDB 9-quad search, two individuals were observed flying overhead during the field spot check. Nesting is not likely, as this species in not tolerant of disturbance when nesting (The Cornell Lab 2019).

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Habitat	Potential to Occur
Elanus leucurus	white-tailed kite	None	None/S, FP	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland.	**Low.** Some perching and foraging habitat available on Site, however limited nesting sites and disturbed woodland habitat present. Therefore, potential to occur is low.
Falco columbarius	merlin	None	None/WL	Open forests and grasslands (The Cornell Lab 2019).	**Observed.** While this species did not appear in the CNDDB 9-quad search, one individual was observed perching on Site during the field spot check. Merlin nesting does not occur in California.
Falco mexicanus	prairie falcon	None	None/WL, BCC	Inhabits dry, open level or hilly terrain.	**Moderate.** Preferred foraging habitat available on Site, however preferred nesting habitat is not present. Therefore, potential to occur is moderate.
Mammals					
Antrozous pallidus	pallid bat	None	None/S, SSC	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting.	**Low.** Suitable open, non-urbanized, foraging habitat is available on Site, however preferred rocky roosting sites are available. Therefore, potential to occur is low.
Corynorhinus townsendii	Townsend's big-eared bat	None	None/S, SSC	Throughout California in a wide variety of habitats. Most common in mesic sites.	**Moderate.** Suitable open, non-urbanized, foraging habitat is available on Site, however limited roosting sites are available. Therefore,

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Habitat	Potential to Occur
					potential to occur is moderate.
Lasiurus blossevillii	western red bat	None	None/SSC	Roosts primarily in trees, 2-40 ft above ground	**Moderate.** Suitable open, non-urbanized, foraging habitat is available on Site, and while trees within the desired height range are present, they are limited in numbers and do not form dense stands. Therefore, potential to occur is moderate.
Perognathus inornatus	San Joaquin Pocket Mouse	None	None/S	Grassland, oak savanna and arid scrubland in the southern Sacramento Valley, Salinas Valley, San Joaquin Valley and adjacent foothills, south to the Mojave Desert.	**Low.** Non-native grassland is present on Site; however, it is highly disturbed by active grazing and formed dense swards, which are not preferable for burrows. Additionally, few burrows were observed on Site during the field spot check, and those present were likely created by ground squirrels, and appeared too big to be suitable to mice. The nearest CNDDB occurrence is over 10 miles from the Site. Therefore, potential to occur is low.
Taxidea taxus	American badger	None	None/SSC	Open stages of most shrub, forest, and herbaceous habitats, with friable soils.	**Moderate.** There is one known CNDDB occurrence approximately 1.5 miles from the Site; however, the Site is highly disturbed by active cattle grazing and no potential

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Habitat	Potential to Occur
					American badger burrows were observed during the field spot check. Therefore, potential to occur is moderate.
Amphibians					
Emys marmorata	western pond turtle	None	None/S, SSC	Ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation.	**Low.** While one drainage feature with flowing water was observed on Site, the flow was merely a trickle and aquatic vegetation was sparse and highly disturbed by active grazing. A lack of native habitat was present on Site and the nearest CNDDB known occurrence is approximately 5 miles from the Site, therefore potential to occur is low.
Rana boylii	foothill yellow-legged frog	None	Candidate Threatened/ S, SSC	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats.	**Low.** Although highly disturbed by cattle, one drainage feature with flowing water was observed on Site. However, this drainage feature was not observed to have a rocky substrate. The nearest known CNDDB occurrence is over 4 miles south of the Site in Cortina Creek from 1993. Therefore, potential to occur is low.
Spea hammondii	western spadefoot	None	None/S, SSC	Occurs primarily in grassland habitats but can be found in valley-foothill	**Low.** While non-native grassland habitat is present on Site, suitable habitat is highly disturbed due to consistent active

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Habitat	Potential to Occur
				hardwood woodlands.	grazing, and the nearest CNDDB occurrence is over 5 miles from the Site. Therefore, potential to occur is low.
Invertebrates					
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	Threatened	None	Occurs only in the Central Valley of California, in association with blue elderberry (*Sambucus mexicana*).	**Low.** Blue elderberry was not observed on Site. Therefore, potential to occur is low.
Lepidurus packardi	vernal pool tadpole shrimp	Endangered	None	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water.	**Moderate.** While all potential wetland areas on Site were highly disturbed due to active cattle grazing, there are two features that have potential to be vernal pools; vernal pool presence will be determined during a formal jurisdictional delineation.
Lytta molesta	molestan blister beetle	None	None	Known preferred habitat information for this species across California is sparse.	**Low.** The entire Site is highly disturbed due to active cattle grazing, and the nearest known CNDDB occurrence is over 10 miles from the Site. Therefore, potential to occur is low.
Saldula usingeri	Wilbur Springs shorebug	None	None	Requires springs/creeks with high concentrations of minerals.	**Low.** The entire Site is highly disturbed due to active cattle grazing. No hot springs (waters commonly containing high mineral concentrations) were present on

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Habitat	Potential to Occur
					Site. Therefore, potential to occur is low,
Thamnophis gigas	giant gartersnake	Threatened	Threatened	Freshwater marsh and low gradient streams. Adapted to drainage canals and irrigation ditches.	**Low.** All potential wetland areas on Site were highly disturbed due to active cattle grazing; this species is highly associated with developed and irrigated agricultural fields. The nearest CNDDB occurrence is approximately 4 miles away, and within an agricultural area. Therefore, the potential to occur is low.

Notes: Results based on CNDDB and CNPS query for 9 regional quadrangles (Cortina Creek, Salt Canyon, Manor Slough, Williams, Rumsey, Glascock Mountain, Wilson Valley, Wilbur Springs, and Leesville).
BCC USFWS Birds of Conservation Concern
FP CDFW Fully Protected
S BLM Sensitive Species
SSC CDFW Species of Special Concern
WL CDFW Watch List

A biological field survey was conducted on November 19, 20, and 21, 2019. A meandering survey was performed throughout the 967.2-acre Site. This survey focused on visiting potential jurisdictional features and areas that showed a potential vegetation shift based on aerial imagery. Since most of the Site consists of either non-native grassland or unvegetated agricultural field, views of the project area were mostly unobstructed; however, given the size of the project area, 100% visual ground coverage of the Site was not performed.

The objectives of the field survey were to:

- Characterize and map the habitats/vegetation communities onsite;
- Determine the potential presence of special-status species; and
- Determine if additional surveys are required.

During the survey, any special-status species or habitat for special-status species were noted and mapped using a sub-meter accuracy Arrow 100 Global Position System (GPS) device. Likewise, vegetation communities and potential wetlands observed within the Site were mapped on aerial photographs using the Collector application.

RESULTS

Vegetation Mapping

Vegetation communities within the 967.2-acre Site were mapped. Results of the vegetation mapping are s shown in Figure 2. Table 2 summarizes the six vegetation communities observed and their corresponding acreage.

Table 2: Vegetation Communities Observed On Site

Habitat	Acreage
Developed	4.9
Disturbed Potential Wetland	4.7
Disturbed Riparian Woodland	4.2
Native Forbs	21.9
Non-native Grassland	706.1
Unvegetated Agricultural Fields	225.4

The non-native grassland community was the most common community found throughout the Site. This community contained the following dominant plant species: non-native yellow star thistle (*Centaurea solstitialis*), non-native oat (*Avena* sp.), and native hayfield tarweed (*Hemizonia congesta).* All areas of this community on Site were actively grazed by cattle. It appeared that cattle did not eat hayfield tarweed since portions of this community contained dense stands of hayfield tarweed. A small tree stand consisting of native northern California black walnut (*Juglans hindsii*), non-native Peruvian pepper tree (*Schinus molle),* alder (*Alnus* sp.) and fan palm (*Washingtonia* sp.) occurs in the south of this community, near to the southern Site border; however, due to the small size of this stand (approximately nine trees), this area was not called out as a separate vegetation community.

Unvegetated agricultural fields were present in two portions of the Site and consisted of unvegetated soil that was actively disked/tilled.

One developed area was present in the northwest portion of the Site. This area consisted of a house, multiple barns/storage sheds, dirt road, and non-native ornamental species such as eucalyptus (*Eucalyptus* sp.) and rosemary (*Rosmarinus officinalis)*.

Disturbed riparian woodland was present in the southeast portion of the Site. This community contained the following dominant plant species, all of which are native: Fremont cottonwood (*Populus fremontii*), red willow (*Salix laevigata)*, and Goodding's black willow (*Salix gooddingii*). Likely due to intense grazing, saplings of these riparian trees were not observed, so this community likely would not persist long-term with the current land use of the Site.

The native forbs community occurred in three areas within the Site. This community occurred primarily on south-facing slopes and was dominated by native vinegarweed (*Trichostema lanceolatum)*, non-native yellow star thistle, and non-native oat. Due to the high presence of native forbs skeletons (greater than 10% relative cover), this community was called out separately from the non-native grassland community that surrounds it. It is likely that other native annual forbs and wildflowers could be identified in this community during the spring blooming period; this vegetation community likely would be reclassified and more accurately mapped if a survey is conducted in the spring.

Representative photographs of all vegetation communities are included in Attachment 2. Overall, the Site is heavily disturbed by cattle and agricultural activity; as stated, no vegetation communities

are sensitive according to CNDDB data (CDFW 2019), however the native forbs community has the potential to be reclassified if a survey is conducted in the spring.

Potential Jurisdictional Features

Potential jurisdictional features herein refer to waters, wetlands, or drainages that have potential to fall under jurisdiction of (1) the United States Army Corps of Engineers (USACE) under the Clean Water Act and/or (2) the state of California (State) under the Dickey Water Pollution Act and Porter-Cologne Water Quality Control Act. The biological field survey conducted in November 2019 was not a formal jurisdictional delineation, therefore all features were identified as potential jurisdictional features, but a formal delineation will need to determine the legal status of each feature.

Multiple potential jurisdictional features were observed within the Site, as shown in Figure 3. All potential jurisdictional features were heavily disturbed by active cattle grazing. Each feature is described in more detail below. A feature was considered an ephemeral drainage if a defined bed and bank was observed sporadically and connectivity to another drainage feature was observed, but water or damp soils were not present within. A feature was considered a riverine if either standing or flowing water was observed within, and a defined bed and bank was present throughout the entire feature. A feature was considered erosional if a defined bed and bank was not easily distinguishable, and connection to another drainage feature was not visible. All features have the potential to be reclassified during a formal jurisdictional delineation. Photographs of all potential jurisdictional features are included in Attachment 2.

Standing Water #1

Standing Water #1 is the low point of Disturbed Potential Wetland #8 located in the northeast portion of the Site (Figure 3), which is further described below. The standing water was observed in an unvegetated area and was approximately one foot deep at its deepest point. No aquatic wildlife were observed. It was apparent that cattle frequently walked through this water feature. Wetland hydrology is present in the form of surface water, hydric soils are likely present, and hydrophytic vegetation is not present within this feature, however has the potential to be present in the greater Disturbed Potential Wetland #8 area. This feature has potential to be considered a vernal pool.

Standing Water #2

Standing Water #2 is located near the eastern Site boundary. The standing water was in an unvegetated area and was approximately one foot deep at its deepest point. No aquatic wildlife were observed. It was apparent that cattle frequently walked through this water feature. The ground surrounding the standing water was primarily unvegetated due to active cattle grazing and trampling. In a small areas adjacent to the standing water where patchy forbs occurred, canarygrass (*Phalaris* sp.) was the dominant plant species. This area was not large enough to map as a separate vegetation community. An ephemeral drainage may have historically connected to this feature; however, due to intense grazing of the Site, no indicators of connection to another body of water or drainage feature were observed. Wetland hydrology is present in the form of surface water, hydric soils are likely present, and hydrophytic vegetation is not present within this feature. This feature has potential to be considered a vernal pool.

Ephemeral Drainage #3

Ephemeral Drainage #3 ran through most of the Site, starting in the northwest and ending in the southeast of the Site, where this feature connected to a riverine feature. This drainage ranged from approximately 1 to 7 feet wide. Evidence of water flow was present in the form of a change in soils,

a defined bed and bank, and a culvert present where a dirt road crossed this feature. A change in vegetation was also observed in the southeast portion of the feature. The dominant plant species observed within this feature were the non-native yellow star thistle and various non-native grasses, however, native species observed were rush (*Juncus* sp.), willows (*Salix* sp.), and Fremont cottonwood. These native species were observed primarily in the southeast portion of the Site (Figure 3). Water or damp soils were not observed within this feature. It is likely that wetland hydrology, hydric soils, and hydrophytic vegetation are not present within this feature.

Erosional Feature #4

Erosional Feature #4 occurred in the southwest portion of the Site and ranged from approximately 1 to 5 feet wide (Figure 3). It appears to have historically connected to Riverine #5, however above ground connectivity to this riverine feature does not appear to be currently present. This could potentially be due to partial loss of a defined bed and bank due to cattle grazing. The dominant plant species observed within this feature were yellow star thistle, canarygrass, and various non-native grasses. Damp soils were not observed in this feature; evidence of water flow was present in a sporadic defined bed and bank. Hydric soils and hydrophytic vegetation were not observed in this feature, and it is likely that wetland hydrology would not be present.

Riverine #5

Riverine #5 occurred in the central portion of the Site and continued up to the southwestern Site boundary (Figure 3). This drainage ranged from approximately 3 to 10 feet wide. A defined bed and bank was present throughout, and flowing water and wet soils were observed in the western portion of the feature. Yellow star thistle and non-native grasses were dominant, but rush, willows, Fremont Cottonwood, and ragweed (*Ambrosia* sp.) were observed within the feature primarily in the western portion where water and wet soils were present. Wetland hydrology and hydrophytic vegetation were present and hydric soils are likely present in this feature.

Riverine #6

Riverine #6 occurred in the southernmost portion of the Site, running along the Site boundary. This feature was south of an unmarked dirt road that is outside of the southern fenced boundary of the Site (Figure 3); the area across the unmarked dirt road is actively grazed. This feature ranged from approximately 5 to 15 feet wide. A defined bed and bank was present throughout, and standing water and wet soils were observed. Small mammal burrows, likely created by ground squirrels, were present within the banks. Fremont cottonwood, willows, and northern California black walnut were present within the drainage, and non-native grasses dominated the understory. Wetland hydrology and hydrophytic vegetation were present and hydric soils are likely present in this feature.

Erosional Feature #7

Erosional feature #7 occurs in the central portion of the Site, just north of Disturbed Riparian Woodland #9, and is unvegetated and approximately 1 foot wide. Evidence of water flow was present in the form of a change in sediment, bedrock presence, and a short stretch of a defined bed and bank. Based on aerial imagery, this feature appears to have historically been an ephemeral drainage that would feed Disturbed Riparian Woodland #9; however, due to intense grazing of the Site, a connection to Disturbed Riparian Woodland #9 was not observed. The topographical lowland within this area appeared to be heavily used as a cattle trail, therefore if a defined bed and bank extending this feature further historically was present, it was no longer detectable. Wetland hydrology, hydrophytic vegetation, and hydric soils are not expected to be present in this feature.

Disturbed Potential Wetland #8

Disturbed Potential Wetland #8 occurred in the far northeastern corner of the Site. This area contained muddy soils, and the low point had standing water (see Standing Water #1). Dominant plant species included canarygrass, morning glory (*Calystegia* sp.), and goosefoot (*Chenopodium* sp.); one mature Fremont cottonwood and a handful of disturbed willows were also present. Based on aerial imagery and NWI data (USFWS 2019), this feature appeared to be fed by a drainage extending to the north. Wetland hydrology was present and hydric soils are likely present in this feature; there is potential for hydrophytic vegetation to be present, but this should be verified in the spring when plants can be identified. This feature has potential to be considered a vernal pool.

Disturbed Riparian Woodland #9

Disturbed Riparian Woodland #9 occurs in the southeast portion of the Site. Dominant plant species included Fremont cottonwood and willows. While no standing water or mud was observed, based on the depth of cattle footprints in the area, it appeared that the ground is wet for part of the year. A defined bed and bank was not observed in this feature. Based on aerial imagery and NWI data (USFWS 2019), this feature appears to have historically connected to other drainage features to the north and south; however, due to intense grazing of the Site, this connection was not visible. Hydrophytic vegetation is likely present in this feature, and there is potential for the presence of wetland hydrology and hydric soils.

Other Observations

Tables 3 and 4 list the plant and wildlife species that were observed in the Site. Due to the timing of the field survey in fall, some annual plant species could not be identified to species level.

Table 3: Plant Species Observed in the Site

Scientific Name	Common Name
Alnus sp.	alder
Ambrosia sp.	ragweed
Asclepias sp.	milkweed
Avena sp.*	oat
Bromus sp.*	brome
Calystegia sp.	morning glory
*Centaurea calcitrapa**	purple star thistle
*Centaurea solstitialis**	yellow star thistle
Chenopodium sp.	goosefoot
Croton setiger	doveweed
*Cynodon dactylon**	bermuda grass
Erigeron sp.	horseweed
Erodium sp.*	filaree
Eucalyptus sp.*	eucalyptus
Hemizonia congesta	hayfield tarweed
Juglans hindsii	northern California black walnut
Juncus sp.	rush
Lactuca sp.	wild lettuce
*Malva parviflora**	cheeseweed
*Marrubium vulgare**	white horehound
Phalaris sp.	canarygrass
Populus fremontii	Fremont cottonwood
*Prunus dulcis**	domestic almond
Pseudognaphalium sp.	cudweed
Quercus agrifolia	coast live oak

Table 3: Plant Species Observed in the Site

Scientific Name	Common Name
*Rosmarinus officinalis**	rosemary
Rumex sp.	dock
Salix gooddingii	Goodding's black willow
Salix laevigata	red willow
*Schinus molle**	Peruvian pepper tree
Trichostema lanceolatum	vinegarweed
Typha sp.	cattail
Washingtonia sp.	fan palm
Xanthium strumarium	cocklebur

* Non-native plant species.

Table 4: Wildlife Species Observed in the Site

Scientific Name	Common Name
Mammals	
*Bos taurus**	cow
Canis latrans	coyote
Spermophilus sp.	ground squirrel
Birds	
Agelaius phoeniceus	red-winged blackbird
Buteo jamaicensis	red-tailed hawk
Cathartes aura	turkey vulture
Circus hudsonius	northern harrier
Eremophila alpestris	horned lark
Euphagus cyanocephalus	Brewer's blackbird
Falco columbarius	merlin
Falco sparverius	American kestrel
Lanius sp.	shrike
*Molothrus ater**	brown-headed cowbird
Sayornis nigricans	black phoebe
Sayornis saya	Say's phoebe
Sparrow sp.	sparrow
*Streptopelia decaocto**	Eurasian collared-dove
Sturnella neglecta	western meadowlark
Zenaida macroura	mourning dove
Invertebrates	
Danaus plexippus	monarch

In addition, biologists observed one inactive raptor nest within the disturbed riparian woodland vegetation community. A few small mammal burrows were observed within the bank of Riverine #6 and in unvegetated patches within the Site, primarily adjacent to fencing, and are likely ground squirrel burrows.

SUMMARY OF RECOMMENDATIONS

The following bullets summarize the additional steps needed for this Site to address natural resources issues.

Jurisdictional Delineation

- A jurisdictional delineation is recommended for all potential jurisdictional features to determine if jurisdictional wetlands or waters are present, if the project design cannot avoid

these features. If the project design can avoid the potential jurisdictional features shown on Figure 3, plus a 50-foot buffer, a jurisdictional delineation is not required.

- If jurisdictional features are identified in the subsequent delineation and would be impacted by the final project design, the following permits may be required:
    - Section 404 permit from USACE
        - This permit is required when project activities result in the discharge of dredged or fill material into "navigable Waters of the United States", including wetlands. This permit is required if impacts to the Waters of the U.S. cannot be avoided. Section 404 permitting would create a federal nexus with USACE, which would allow for Section 7 consultation with the USFWS, if required. Compensatory mitigation may be required to ensure no net loss of wetlands.
    - Section 401 Water Quality Certification from the California Regional Water Quality Control Board (RWQCB)
        - This California agency permit is required if there are impacts to "Waters of the State," which include Waters of the U.S. If the Section 404 permit with USACE is required, the Section 401 permit with RWQCB is also required.
    - Section 1600 Streambed Alteration Agreement from CDFW
        - This Agreement with CDFW is required when a project will do one or more of the following: (1) substantially obstruct or divert the natural flow of a river, stream, or lake; (2) substantially change or use any material from the bed, channel, or bank of a river, stream, or lake; or (3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake.

Additional Field Surveys

- A rare plant survey is recommended during the spring and summer blooming periods for the three target species with moderate or high potential to occur identified in Table 1.
- A raptor nest survey is recommended to occur concurrently with the spring rare plant survey. The raptor nest survey will determine if any active nests occur within the project area and an adjacent 5-mile radius. The results of the raptor nest survey will determine whether a mitigation measure for mitigating the loss of Swainson's hawk foraging habitat within 5 miles of an active nest would be required by purchasing credits from a mitigation bank.
- Given the moderate potential for burrowing owls to occur on Site, completion of the Burrowing Owl Survey Protocol is recommended (The California Burrowing Owl Consortium 1993). This protocol is intended whenever there is potential for a project to adversely affect burrowing owls. The survey protocol is a four-step process that documents the presence of burrowing owl habitat in a habitat assessment (Phase 1), conducts surveys for burrows (Phase 2), and determines burrowing owl use of the site and surrounding buffer zone (Phase 3). Results are documented in the Resource Summary Report (Phase 4). If occupied habitat is confirmed, mitigation measures are developed in the CEQA document and followed during project implementation to minimize impacts to burrowing owls.
- If vernal pools are identified during the jurisdictional delineation and cannot be avoided in the final project design, USFWS protocol level vernal pool branchiopod surveys would be required. Protocol level vernal pool branchiopod surveys require a USFWS-permitted biologist to conduct one wet season and one dry season survey to determine presence or absence of listed vernal pool species. Sufficient rainfall is required to ensure reliable survey results. The requirement for protocol level vernal pool branchiopod surveys can cause significant project delay and can add to project costs. It is recommended that the project be designed to avoid vernal pools, if found to occur during the jurisdictional delineation.

California Environmental Quality Act Process

- Impacts to biological resources will be evaluated in a California Environmental Quality Act (CEQA) document once final design of the project is available.
- The CEQA document will outline required mitigation measures for the project, if applicable.
    - For example, a preconstruction nesting bird and roosting bat survey would likely be required prior to vegetation removal, the use of heavy machinery, or significant ground disturbance if activities are to be conducted within the bird nesting season (February 15 – September 15).

Coordination with USFWS and CDFW

- If the project "may affect" federally threatened and/or endangered species, consultation with USFWS would be required. Additional information on these potential impacts would be available once any required surveys are completed and once additional details on the project impact areas are available (final design). Details on these consultations is provided below.
    - Section 7 consultation with the USFWS would be required if there is a federal nexus for the project. A federal nexus is any federal action, such as actions on Federal land, actions that require a Federal permit (e.g., an U.S. Army Corps of Engineers [USACE] permit), actions that require a Federal license, and actions that use Federal funds.
        - Section 7 consultation typically begins as informal consultation. Informal consultation is initiated when a listed species may be affected by the project. If it is determined that the project is not likely to adversely affect any listed species, and if USFWS concurs, the informal consultation is complete and is documented with a concurrence letter from USFWS.
        - If adverse effects to listed species are anticipated by the project, formal consultation is required. Formal consultation requires the preparation a Biological Assessment (BA) and the USFWS would issue the project a Biological Opinion in 135 days. However, for the BA to be prepared any required surveys must be completed. Some surveys can take a year or more to complete.

      OR

    - Section 10 consultation with the USFWS would be required if there is no federal nexus for the project.
        - The applicant would need to prepare a Habitat Conservation Plan for the USFWS and obtain an incidental take permit (ITP) if take of listed wildlife species is anticipated from the project.
        - Preparation of the Habitat Conservation Plan and ITP application could take years since there is no regional HCP in Colusa County to facilitate the permitting process. Likewise, issuing an ITP is considered a "discretionary action" under NEPA; therefore, a draft NEPA document, such as an Environmental Assessment, must be included with the permit application. There is no set timeline for receiving the ITP upon receipt of the application. Section 10 consultation can take much longer than Section 7 consultation.
- If the project would adversely affect state threatened or endangered species, consultation with CDFW would be required.
    - The applicant would apply for an ITP from CDFW.

- If USFWS consultation is also required because the project would affect species that are both federally and stated listed, the CDFW would issue a Consistency Determination if take will occur or a letter of concurrence if take will not occur.
- If the project would only affect a state listed species, CDFW would issue an ITP if the project may result in take.

It is recommended that these additional steps be scheduled during the appropriate survey windows to identify future permitting needs and avoid significant project delays. If habitat for special-status species and potential jurisdictional areas can be avoided during the finalization of the project design, this could minimize the required surveys and next steps listed above. Therefore, it is recommended that the habitats for special-status species and potential jurisdictional areas be avoided as much as possible and that additional analysis is performed to finalize the next steps listed above once the design is final.

Tetra Tech appreciates the opportunity to provide services in support of the Janus Solar Project. Please let me know if you have any questions or need more information.

TETRA TECH, INC.

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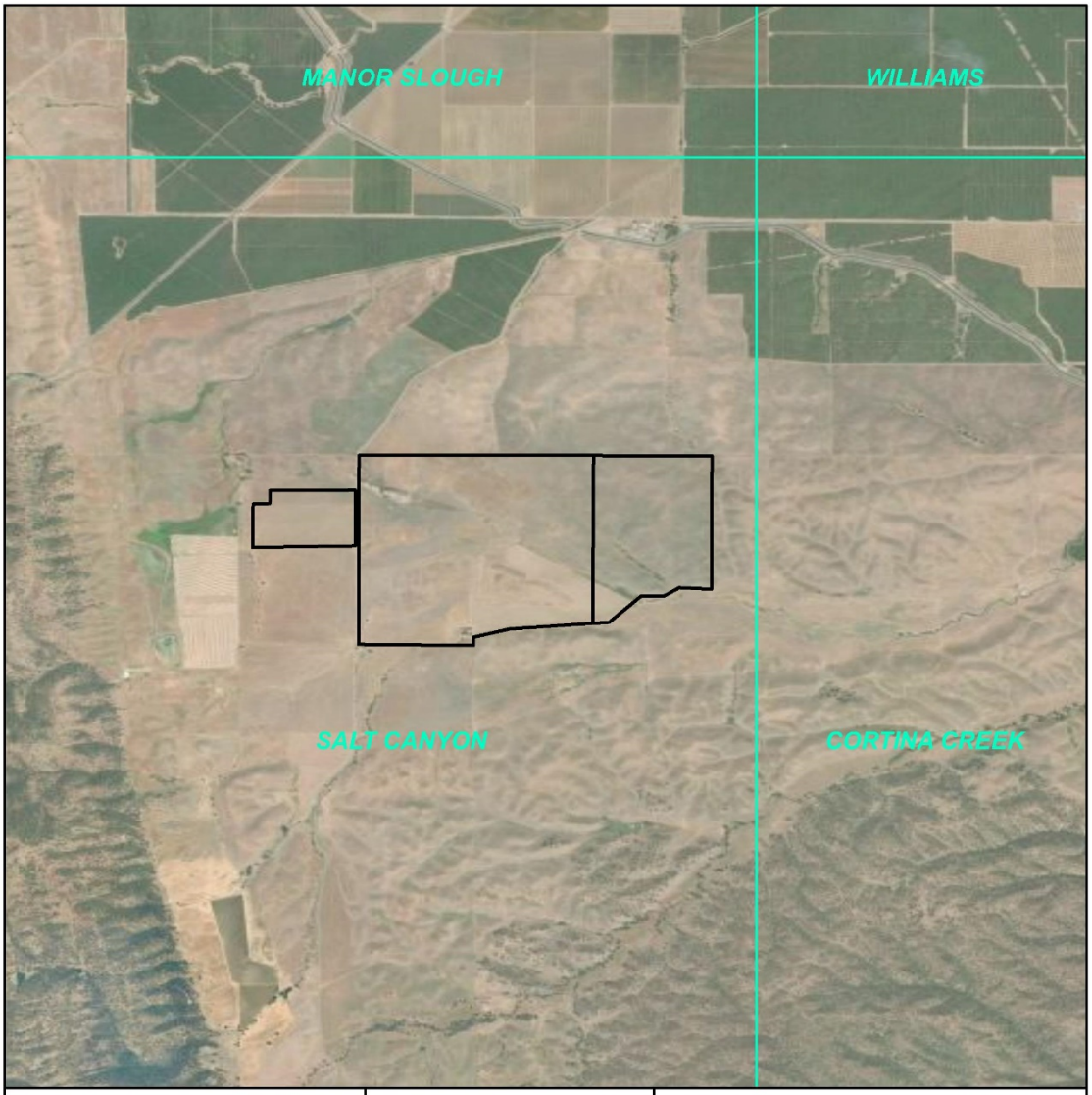
TETRA TECH

ATTACHMENT 1 – REPORT FIGURES



Project Boundary

USGS Quadrangle Boundary

N

0 0.25 0.5 0.75 1 Miles

WGS_1984_Web_Mercator_Auxiliary_Sphere

Credits:ESRI

FIGURE 1

PROJECT LOCATION

JANUS SOLAR

COLUSA COUNTY, CA

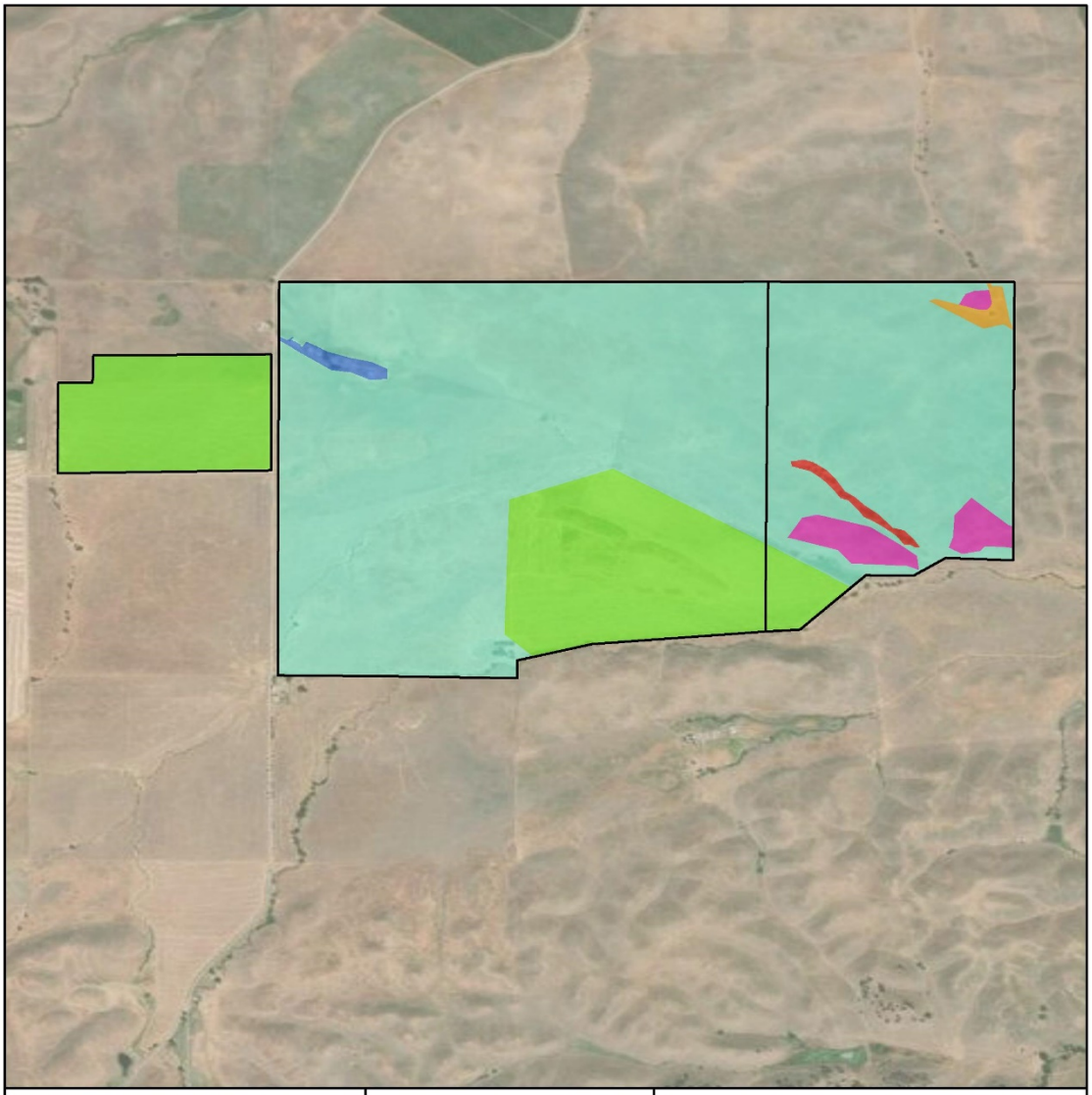


FIGURE 2

VEGETATION COMMUNITIES

JANUS SOLAR

COLUSA COUNTY, CA

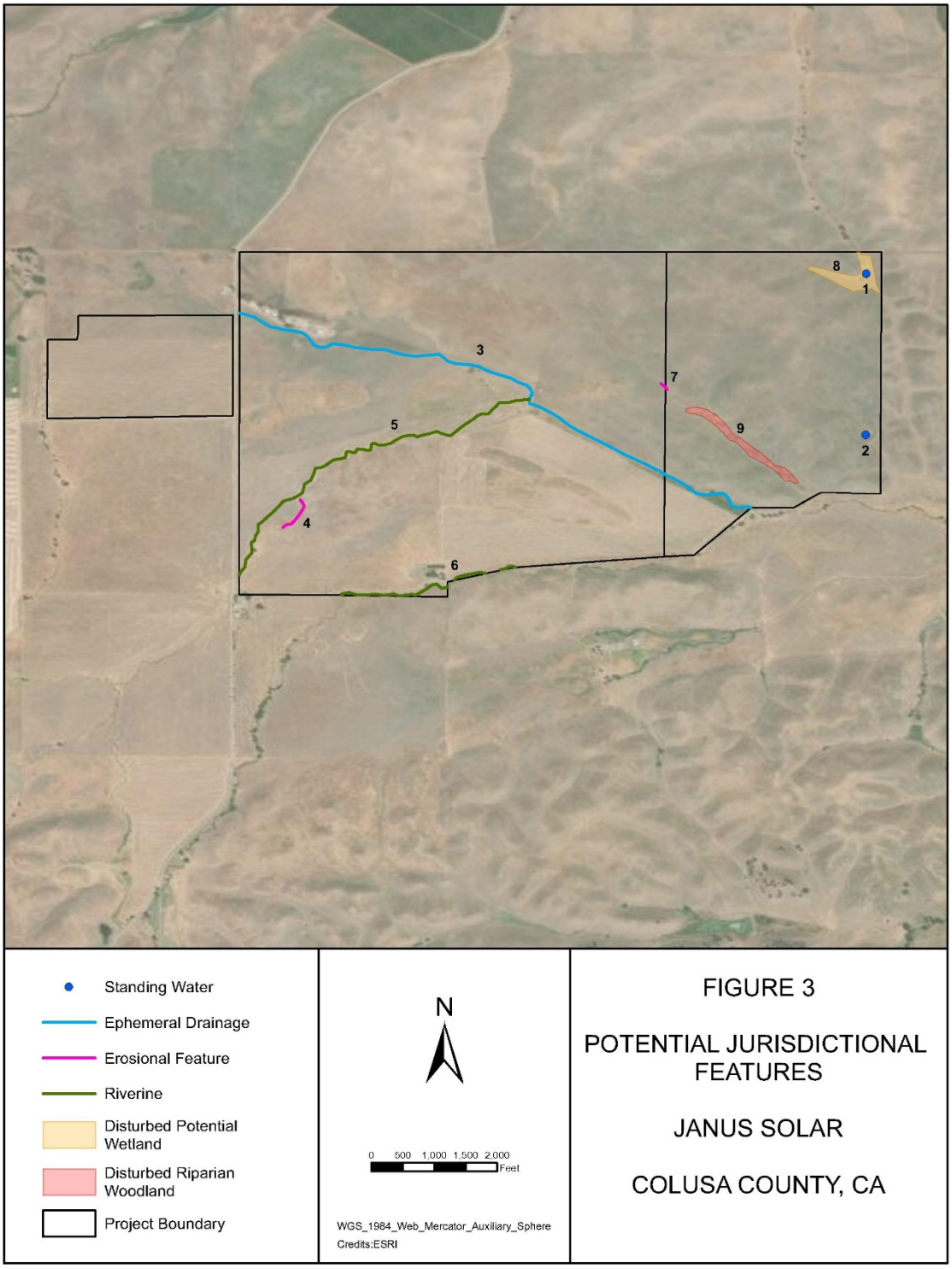


FIGURE 3

POTENTIAL JURISDICTIONAL FEATURES

JANUS SOLAR

COLUSA COUNTY, CA

ATTACHMENT 2 – SITE PHOTOGRAPHS

Photograph 1	
Notes: Disturbed potential wetland community (potential jurisdictional feature #8). Standing water and muddy soils visible.	

Photograph 2	
Notes: Disturbed potential wetland community (potential jurisdictional feature #8). Muddy soils and change in vegetation visible.	

Photograph 3	
Notes: Disturbed riparian woodland community (potential jurisdictional feature #9).	

Photograph 4	
Notes: Native forbs community. Vinegarweed skeletons visible.	

Photograph 5	
Notes: Non-native grassland community.	

Photograph 6	
Notes: Unvegetated agricultural fields. Brown grasses shown are all uprooted and in the form of debris mixed into soil.	

Photograph 7	
Notes: Standing water #1, within disturbed potential wetland #8.	

Photograph 8	
Notes: Standing water #2.	

Photograph 9	
Notes: Ephemeral drainage #3, western portion.	

Photograph 10	
Notes: Ephemeral drainage #3, eastern portion.	

Photograph 11	
Notes: Erosional feature #4.	

Photograph 12	
Notes: Riverine #5.	

Photograph 13	
Notes: Riverine #6. Fence adjacent to south side of unmarked dirt road can be seen in the bottom, right-hand corner.	

Photograph 14	
Notes: Erosional feature #7.