Appendix D.1

Biological Resources Technical Report
E-Group PS Solar Project

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April 2025

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E-Group PS Solar Project

APRIL 2025

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
ACE	Area of Conservation Emphasis
APN	is located on Assessor's Parcel Numbers
BIOS	Biogeographic Information and Observation System
BMP	best management practices
BSA	biological survey area
Cal-IPC	California Invasive Plant Council
CDFW	California Department of Fish and Wildlife
CDNPA	California Desert Native Plants Act
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
CWA	Clean Water Act
FESA	federal Endangered Species Act
HMMP	Habitat Mitigation and Monitoring Plan
ISA	International Society of Arboriculture
ITP	Incidental Take Permit
LEH	lake effect hypothesis
MBTA	Migratory Bird Treaty Act
MESA	Mapping Episodic Stream Activity
MM	Mitigation Measure
OHWM	ordinary high-water mark
PVC	polyvinyl chloride
RWQCB	The Regional Water Quality Control Boards
SCE	Southern California Edison
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WEAP	Worker Environmental Awareness Program
WJTCA	Western Joshua Tree Conservation Act

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1 Introduction

This report documents the results of surveys conducted to identify potential biological resources for the E-Group PS Solar Project (project) located in the City of Twentynine Palms (City), San Bernardino County, California. Figure 1, Project Location, shows the regional location and vicinity of the project. All figures are provided in Appendix A, Figures.

The purpose of this report is to (1) describe the conditions of biological resources within the project site in terms of vegetation communities, plants, wildlife, wildlife habitats, and wetlands; (2) quantify potential direct and indirect impacts to special-status biological resources that would result from the project; (3) discuss those impacts in terms of biological significance in view of federal, state, and local laws; the San Bernardino County Policy Plan; and the City of Twentynine Palms General Plan; and (4) specify measures to avoid, minimize, and/or mitigate any significant impacts that would occur to special-status biological resources as a result of project implementation. For the purposes of this analysis, impacts were evaluated separately for the "Project-Level" (i.e., project site including on—site access roads and PV installation area and off-site gen-tie and access road alignment), and for the "Future Road Dedications" (i.e., City-requested future extensions of Samarkand Drive, Amboy Road, and Noels Knoll Road). Mitigation for biological resource impacts within the Future Road Dedications will only be implemented if and when these roads are built.

1.1 Project Description

1.1.1 Project Location

The project site includes a 184-acre solar facility site that is located on Assessor's Parcel Numbers (APNs) 0612-201-01-0000 and 0612-201-05-0000 and includes approximately 3.3-acres of off-site areas that are associated with a proposed site driveway constructed off Two Mile Road and gen-tie alignment from the proposed solar facility to the existing Southern California Edison (SCE) Carodean Substation, and 11.7 acres of road dedications for Amboy Road, Samarkand Drive and Noels Knoll Road. The project site is located in the City of Twentynine Palms, San Bernardino County, California, and is bounded by undeveloped lands in all directions. The project area is bordered by vacant desert land to the north; by vacant desert land, then a dirt road (Canyon Road) to the west; by vacant desert land, then Sunrise Road (a dirt road), then several rural residential properties to the east; and by vacant desert land, then Two Mile Road (a paved road) to the south (Figure 1). The project is located in Section 23 of Township 1 North, Range 8 East on the San Bernardino Principal Meridian, U.S. Geological Survey (USGS) Twentynine Palms 7.5-minute quadrangle. The approximate center of the project corresponds to 34.160458°N and -116.115977°W. Regional access to the project site is provided via Route 62 (SR 62).

1.1.2 Project Description

E-Group PS LLC (E-Group) proposes to entitle, construct, operate, and maintain the project, which would consist of up to 50 megawatts of photovoltaic solar generation and would connect via a generation interconnection line along Two Mile Road to the nearby SCE Carodean Substation (Figure 2, Site Plan). Construction is proposed to begin in January 2026, with the project becoming commercially operational by January 2027. The operational lifespan of the facility is estimated to be 35 years.

Pursuant to a request from the City, E-Group has agreed to dedicate 30 feet (or one-half of the required road width) to the City for future extensions of Amboy Road and Noels Knoll Road and 60 feet for the future extension of Samarkand Drive. The future road extensions are not currently proposed to be constructed, as there are other parcels in between the existing roads and the site where the roads would need to be constructed for the extensions adjacent to the site to be serviceable. The proposed roads are not required by the project and are not proposed to be utilized by the project. Nevertheless, because the requested dedications make road construction reasonably foreseeable, the biological resources present within Amboy Road, Noels Knoll Road, and a portion of the Samarkand Drive road dedication areas were mapped during the project's survey efforts and the potential future impacts are analyzed as part of the proposed project.[1] However, it should be noted that mitigation for biological resource impacts within the future extensions of Samarkand Drive, Amboy Road, and Noels Knoll Road will only be implemented if and when these roads are built and are therefore analyzed separately within this report.

Project Site

The proposed project consists of approximately 160,000 ground-mounted solar panels. A series of PV module arrays will be mounted on racking systems supported by a steel pile-driven foundation design. Each array will be approximately 104 feet wide and 252 feet long, consisting of 720 PV panels in each array. Each array will be spaced approximately 10 feet apart to allow access. Each mounted solar array is approximately 6 to 7 feet tall above grade depending on the slope. Minimum ground clearance will be 3 feet, with an average ground clearance throughout the site of 4.5 feet. Security will be provided by an approximately 7-foot-high fence, which will include CCTV cameras to be monitored by a local security company. The solar arrays will be generally setback a minimum of 30 feet from the security fence perimeter. Points of ingress/egress will be accessed by locked remotely controlled 40-foot-wide gates for facility services and maintenance, as required.

Off-Site Gen-Tie Line

The energy will ultimately be delivered to the SCE transmission network at Carodean Substation via underground gen-tie line, measuring approximately 0.5 miles long. The gen-tie line will run from the site, underground below the improved access road on the site south to Two Mile Road, then west along Two Mile Road (proposed within the northern right-of-way on the edge of the road), to the point of interconnection at Carodean Substation. As proposed, the gen- tie will generally parallel the alignment of the project driveway/access road from the on-site substation south towards Two Mile Road. Within the disturbed right-of-way of Two Mile Road, the proposed gen-tie line will turn west and then parallel Two Mile Road for approximately 0.5 miles. At this point, the gen-tie will turn south to be installed beneath Two Mile Road and then continue its underground alignment for approximately 60 feet before transitioning to aboveground via a single pole to be installed just outside the existing Carodean Substation fence line.

Off-Site Access Road

Access to the site will be provided through a private driveway from Two Mile Road. E-Group will improve the road to be elevated and reinforced with compacted gravel surface. The improved road will be approximately 26 feet in width and 1,250 feet long. Additional compacted gravel roads for fire access will be constructed through the site, which

[1] Note that the future road dedication area for Samarkand Drive to the west of the project boundary (see Figure 1) was identified by the City after completion of the 2023–2024 biological resources field efforts. Thus, it was not surveyed (it is outside the biological survey area [BSA]) and is not included in Table 2, Vegetation Communities and Land Cover Types Within the BSA. Future development of this segment of Samarkand Drive is, however, analyzed for potential project impacts to vegetation communities and land cover types. See Table 5C in Chapter 6, Project Impacts.

will be approximately 20 feet in width. Where the roads must cross ephemeral streams, E-Group will install bridges to minimize and avoid any impacts on the streams. Bridges are made of prefabricated steel designed to support 20 tons of weight. The on-site bridge is 20 feet wide and 80 feet long and the off-site bridge along the access road will be 26 feet wide and 40 feet long.

Construction and Project Phasing

Construction would consist of three phases that will take approximately nine months with the project becoming commercially operational after 1 year. Proposed construction hours are between 9:00 a.m. and 5:00 p.m., Monday through Saturday. Construction traffic will be routed along Two Mile Road and will access the site via the improved access road on the south side of the property.

Phase 1: Site Preparation

The site will need to be graded to accommodate the solar facility (Figure 2). E-Group will minimize impacts to vegetation to the greatest extent feasible and will allow areas to revegetate after grading.

E-Group has submitted a Stormwater Pollution and Prevention Plan (SWPPP) to the City for review and approval, which is designed to reduce potential impacts related to erosion and surface water quality during construction activities and throughout the life of the project, including best management practices (BMP). Please refer to the draft SWPPP for further discussion of potential project impacts and proposed BMPs.

Phase 2: Photovoltaic Panel System Installation

The second phase of construction will include installation of steel piles and the PV modules. Steel piles will be driven approximately 7 feet, 6 inches deep into the ground by an automated piling robot. After piles have been driven, the PV modules will be securely attached on the top of piles.

Phase 3: Inverters, Transformers, Substation, Collector System, Interconnection

Underground cables to connect panel strings will be installed using ordinary trenching techniques, which typically include a rubber-tired backhoe excavator or trencher. Wire depths will be in accordance with local, State, and Federal requirements, and will likely be buried within excavated trenches approximately 18 inches wide and 4 feet below grade to accommodate the conduits or direct buried cables. After excavation, cable rated for direct burial or cables installed inside a polyvinyl chloride (PVC) conduit will be installed in the trench, and the excavated soil will likely be used to fill the trench and lightly compressed.

All electrical inverters will be attached under the panels on the fixed tilt racking above ground and transformers will be placed on concrete pads formed with plywood and reinforced with structural rebar. The project substation area will be excavated for the transformer equipment. The site area for the project substation will be graded and compacted to level grade. The foundation for the project substation will be formed with a concrete pad, plywood, and reinforced with structural rebar. E-Group will install a below ground gen-tie line and fiber optic cable running from the project substation to the point of intersection at the Carodean Substation. Commissioning of equipment will include testing and calibration of equipment. The project substation equipment, inverters, collector system, and PV array systems will be tested prior to commencement of commercial operations. Upon completion of successful testing, the equipment will be energized.

SCE has also requested certain interconnection and facility upgrades to connect the project to the Carodean Substation and associated grid. These include development of a structure near the Carodean Substation, likely at the end of the gen-tie line, for SCE's telecommunications equipment and remote terminal units, as well as a new 115kV switchrack position, relays, a remote terminal unit, and 115kV transmission tower structures within and/or adjacent to the existing Carodean Substation. E-Group is also responsible for replacing one existing 220 kV circuit breaker with a 63 kA circuit breaker at the Devers Substation, located immediately north of the City of Palm Springs.

Operations

Upon commissioning, the project will enter the operational phase. For the duration of the operational phase, the project will be operated on an unstaffed basis and monitored remotely, with on-site personnel visitations for security, maintenance, and system monitoring. There will be no full-time site personnel on-site during operation. Trips for maintenance and security will occur as needed but are anticipated to occur very infrequently. The project does not require any lighting for operations. No water is required for operations. As the project's PV arrays produce electricity passively with minimal moving parts, maintenance requirements will be limited. Any required planned maintenance will be scheduled to avoid peak load periods, and unplanned maintenance would be typically responded to as needed depending on the event. E-Group will use a self-powered, water-free cleaning robot for regular cleaning of the panels to remove dust. The only water used to clean panels would be to power-wash panels after a major weather event like a sandstorm. This water would be trucked into the site by a third party and will not impact regional water demand.

Maintenance

Project maintenance performed on the site will consist of equipment inspection and replacement. Facility maintenance will be dispatched on an as-needed basis in response to equipment malfunction or decreased facility performance. The site will also be inspected annually to ensure that the facility is operating as planned. Maintenance will occur during daylight hours, when possible. However, maintenance activities on the PV modules and DC systems will be typically performed at night.

Security

To ensure the safety of the public and the facility, the site will be fenced, and signs posted. Security measures will be installed as necessary to mitigate and/or deter unauthorized access. Access to the site will be controlled and gates installed at the entrance to the site from the private access road from Two-Mile Road.

Project Decommissioning

E-Group will decommission and remove the system and its components at the end of the life of the project and restore the site to its pre-project condition. The site could then be converted to other uses in accordance with applicable land use regulations in effect at that time. Re-power and reuse programs will be researched prior to the decision to decommission to minimize environmental impact. All decommissioning and restoration activities will adhere to the requirements of the appropriate governing authorities and will be in accordance with all applicable federal, state, and City regulations. A collection and recycling program will be executed to dispose of the site materials.

2 Regulatory Setting

2.1 Federal

2.1.1 Federal Endangered Species Act

The federal Endangered Species Act (FESA) of 1973 (16 USC 1531 et seq.), as amended, is administered by the U.S. Fish and Wildlife Service (USFWS) for most plant and animal species, and by the National Oceanic and Atmospheric Administration National Marine Fisheries Service for certain marine species. This legislation is intended to provide a means to conserve the ecosystems upon which endangered and threatened species depend, and provide programs for the conservation of those species, thus preventing the extinction of plants and wildlife. FESA defines an endangered species as "any species that is in danger of extinction throughout all or a significant portion of its range." A threatened species is defined as "any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." Under FESA, it is unlawful to "take" any listed species; "take" is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

FESA allows for the issuance of Incidental Take Permits for listed species under Section 7, which is generally available for projects that also require other federal agency permits or other approvals, and under Section 10, which provides for the approval of Habitat Conservation Plans on private property without any other federal agency involvement.

2.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) prohibits the intentional and unintentional take of any migratory bird or any part, nest, or eggs of any such bird. Under the MBTA, "take" is defined as pursuing, hunting, shooting, capturing, collecting, or killing, or attempting to do so (16 USC 703 et seq.). Currently, the Migratory Birds Office considers nests that support eggs, nestlings, or juveniles to be active. Additionally, Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, requires that any project with federal involvement address impacts of federal actions on migratory birds with the purpose of promoting conservation of migratory bird populations (66 FR 3853–3856). Executive Order 13186 requires federal agencies to work with USFWS to develop a memorandum of understanding. USFWS reviews actions that might affect these species.

2.1.3 Clean Water Act

The Clean Water Act (CWA) provides guidance for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters. Section 401 requires a project operator for a federal license or permit that allows activities resulting in a discharge to waters of the United States to obtain state certification, thereby ensuring that the discharge will comply with provisions of the CWA. The Regional Water Quality Control Boards (RWQCBs) administer the certification program in California. Section 402 establishes a permitting system for the discharge of any pollutant (except dredged or fill material) into waters of the United States. Section 404 establishes a permit program administered by the U.S. Army Corps of Engineers (USACE) that regulates the discharge of dredged or fill material into waters of the United States, including wetlands. USACE implementing regulations are found at 33 Code of Federal Regulations (CFR) Parts 320 through 332. Guidelines for implementation are referred to as the

Section 404(b)(1) Guidelines, which were developed by the U.S. Environmental Protection Agency in conjunction with USACE (40 CFR 230). The guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts.

Wetlands and Other Waters of the United States

The definition of "waters of the United States" establishes the geographic scope for authority under Section 404 of the CWA. The Supreme Court recently clarified what waters are considered "waters of the United States" under the Clean Water Act. In *Sackett v. EPA*, the Supreme Court held that waters of the United States refers only to "those relatively permanent, standing or continuously flowing bodies of water forming geographic[al] features that are described in ordinary parlance as streams, oceans, rivers, and lakes."[2] In determining wetlands subject to Clean Water Act jurisdiction, the majority opinion presents a two-step process under which federal jurisdiction may be asserted over a wetland. The agency must establish "first, that the adjacent [body of water constitutes] … 'water[s] of the United States' (i.e., a relatively permanent body of water connected to traditional interstate navigable waters); and second, that the wetland has a continuous surface connection with that water, making it difficult to determine where the 'water' ends and the 'wetland' begins."[3]

On August 29, 2023, the EPA and USACE announced the final rule amending the 2023 definition of waters of the United States to conform the rule with the *Sackett v. EPA* decision. The 2023 rule eliminates the "significant nexus" test invalidated by the *Sackett* decision from when identifying tributaries, wetlands, and other waters as federally protected and clarifies that the CWA extends only to (a) relatively permanent bodies of water (tributaries such as streams and rivers) connected to traditional navigable waters, the territorial seas, or interstate waters, and (b) wetlands that have a continuous surface connection with those waters. Although the Sackett opinion did not specifically reference streams, the EPA's new rule extends the "continuous surface connection" standard to streams, thereby removing non-permanent, ephemeral streams that do not meet these standards from federal jurisdiction. Note that there is ongoing litigation regarding the waters of the United States rule; therefore, the 2023 rule is not applicable in all states. As confirmed by EPA, the 2023 rule is applicable in California, as one of the states that has not challenged EPA's and USACE's current waters of the United States rules.

The term "wetlands" (a subset of waters of the United States) is defined as "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."[4] As noted above, the *Sackett* decision, and 2023 rule implementing the *Sackett* decision, state that only "adjacent" wetlands, defined as having a continuous surface connection with traditional navigable waters, are subject to federal regulation.[5] In the absence of wetlands, the limits of USACE jurisdiction in non-tidal waters, such as intermittent streams, extend to the "ordinary high water mark"[6] which is defined as "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas."[7]

2 *Sackett v. Env't Prot. Agency*, 598 U.S. 651, 671 (2023).
3 *Id.* at 678.
4 33 CFR 328.3(c)(1).
5 33 CFR 328.3(a)(4), 33 CFR 328.3(c)(2).
6 33 CFR 328.4(c)(1).
7 33 CFR 328.3(c)(4).

2.2 State

2.2.1 California Endangered Species Act

The California Endangered Species Act (CESA) (California Fish and Game Code Chapter 1.5) provides protection and prohibits the take of plant, fish, and wildlife species listed by the State of California. Unlike FESA, under CESA, state-listed plants have the same degree of protection as wildlife, but insects and other invertebrates may not be listed. Take is defined differently than FESA where the definition of "take" is outlined in the Fish and Game Code. Pursuant to the Fish and Game Code, take means to hunt, pursue, catch, capture, or kill, or to attempt to do any of these actions (note that this does not include indirect effects such as harassment). Additionally, unlike FESA, this applies to candidate species as well affording them the same protections as listed species. Take authorization may be obtained by a project applicant from the California Department of Fish and Wildlife (CDFW) under CESA Section 2081, which allows take of a listed species for educational, scientific, or management purposes. In this case, private developers consult with CDFW to develop a set of measures and standards for managing the listed species, including full mitigation for impacts, funding of mitigation implementation, and monitoring of mitigation measures.

Western Joshua Tree

On October 21, 2019, the California Fish and Game Commission (Commission) received a petition from the Center for Biological Diversity to list western Joshua tree (*Yucca brevifolia*) (Center for Biological Diversity 2019).[8] On September 22, 2020, the Commission approved the petition to accept the candidacy proposal for western Joshua tree, effective October 9, 2020 (CDFW 2020). When a plant or wildlife species is granted candidacy under the CESA, the species is given the same protection as a threatened or endangered species while the Commission evaluates whether formal listing as threatened or endangered under the CESA is warranted. On July 1, 2023, The Western Joshua Tree Conservation Act was passed. While western Joshua tree is a candidate species, take for western Joshua tree can be received through payment of pre-determined mitigation fees.

Western Burrowing Owl

On March 5, 2024, conservation groups petitioned the California Fish and Game Commission to protect five imperiled populations of the western burrowing owl (burrowing owl; *Athene cunicularia*) under CESA (Center for Biological Diversity et al. 2024). On October 10, 2024 California Fish and Game Commission added burrowing owl as a candidate for potential listing as a protected species under the CESA. As a candidate for potential listing, the species is temporarily afforded the same protections as a state-listed endangered or threatened species.

[8] On October 21, 2019, the California Fish and Game Commission received a petition to list the following as threatened under the CESA: (1) western Joshua tree (Yucca brevifolia) throughout its California range, or, in the event the Commission determines that listing of Yucca brevifolia throughout its California range is not warranted, then (2) the western Joshua tree population within the northern part of western Joshua tree's California range, or (3) the western Joshua tree population within the southern part of western Joshua tree's California range.

2.2.2 California Fish and Game Code

Fully Protected Species

Sections 3511, 4700, 5050, and 5515 of the California Fish and Game Code outline protection for fully protected species of mammals, birds, reptiles, amphibians, and fish. Species that are fully protected by these sections may not be taken or possessed at any time. CDFW cannot issue permits or licenses that authorize the "take" of any fully protected species, except under certain circumstances, such as scientific research and live capture and relocation of such species pursuant to a permit for the protection of livestock. Furthermore, it is the responsibility of CDFW to maintain viable populations of all native species. Toward that end, CDFW has designated certain vertebrate species as Species of Special Concern, because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction.

Sections 1600–1616

CDFW jurisdiction includes ephemeral, intermittent, and perennial watercourses (including dry washes) and lakes characterized by the presence of definable bed and banks, and existing fish or wildlife resources. CDFW takes jurisdiction to the top of bank of the stream or the limit of the adjacent riparian vegetation, which may include oak woodlands in canyon bottoms. Historical court cases have further extended CDFW jurisdiction to include watercourses that seemingly disappear but reemerge elsewhere. Under the CDFW definition, a watercourse need not exhibit evidence of an ordinary high-water mark (OHWM) to be claimed as jurisdictional. CDFW does not have jurisdiction over ocean or shoreline resources.

Under California Fish and Game Code Sections 1600–1616, CDFW has the authority to regulate work that will substantially divert or obstruct the natural flow of, or substantially change or use any material from, the bed, channel, or bank of any river, stream, or lake. CDFW also has the authority to regulate work that will deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. This regulation takes the form of a requirement for a Lake or Streambed Alteration Agreement and is applicable to all projects. Applications to CDFW must include a complete, certified California Environmental Quality Act (CEQA) document.

California Native Plant Protection Act

The Native Plant Protection Act of 1977 (Sections 1900 et seq. of the California Fish and Game Code) directed CDFW to carry out the Legislature's intent to "preserve, protect and enhance rare and endangered plants in this State." The Native Plant Protection Act gave the California Fish and Game Commission the power to designate native plants as "endangered" or "rare," and protect endangered and rare plants from take. CESA expanded on the original Native Plant Protection Act and enhanced legal protection for plants, but the Native Plant Protection Act remains part of the California Fish and Game Code. To align with federal regulations, the categories of "threatened" and "endangered" species were added to CESA. All "rare" animals in CESA were converted to "threatened," but this did not change for rare plants. Thus, there are three listing categories for plants in California: rare, threatened, and endangered. Because rare plants are not included in CESA, mitigation measures for impacts to rare plants are specified in a formal agreement between CDFW and project proponents.

Nesting Birds

Section 3503 of the California Fish and Game Code states that it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.5 protects all birds of prey (raptors) and their eggs and nests. Section 3511 states that fully protected birds or parts thereof may not be taken or possessed at any time. Section 3513 states that it is unlawful to take or possess any migratory non-game bird as designated in the MBTA.

2.2.3 California Environmental Quality Act

CEQA requires identification of a project's potentially significant impacts on biological resources, and ways that such impacts can be avoided, minimized, or mitigated. CEQA also provides guidelines and thresholds for use by lead agencies for evaluating the significance of proposed impacts.

The State of California CEQA Guidelines (CEQA Guidelines) Section 15380(b)(1) defines endangered animals or plants as species or subspecies whose "survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors." A rare animal or plant is defined in CEQA Guidelines Section 15380(b)(2) as a species that, although not presently threatened with extinction, exists "in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or … [t]he species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered 'threatened' as that term is used in the federal Endangered Species Act." Additionally, an animal or plant may be presumed to be endangered, rare, or threatened if it meets the criteria for listing, as defined further in CEQA Guidelines Section 15380(c).

CDFW has developed a list of "Special Species" as "a general term that refers to all of the taxa the California Natural Diversity Database (CNDDB) is interested in tracking, regardless of their legal or protection status." This is a broader list than those species that are protected under FESA, CESA, and other California Fish and Game Code provisions, and includes lists developed by other organizations, including, for example, the Audubon Watch List. Guidance documents prepared by other agencies, including the Bureau of Land Management Sensitive Species and USFWS Birds of Special Concern, are also included on this CDFW Special Species list. Additionally, CDFW has concluded that plant species listed as California Rare Plant Rank (CRPR) 1 and 2 by the California Native Plant Society (CNPS), and potentially some CRPR 3 plants, are covered by CEQA Guidelines Section 15380.

Section IV, Appendix G, Environmental Checklist Form, of the CEQA Guidelines requires an evaluation of impacts to "any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service."

2.2.4 Porter–Cologne Water Quality Control Act

Pursuant to provisions of the Porter–Cologne Act, the RWQCBs regulate discharging waste, or proposing to discharge waste, within any region that could affect a water of the state (California Water Code Section 13260[a]). The State Water Resources Control Board defines a water of the state as "any surface water or groundwater, including saline waters, within the boundaries of the state" (California Water Code, Section 13050[e]). All waters of

the United States are waters of the state. Waters of the state include wetlands, and the State Water Resources Control Board definition of wetlands includes the following:

1. Natural wetlands.
2. Wetlands created by modification of a surface water of the state.
3. Artificial wetlands that meet any of the following criteria:
    a. Approved by an agency as compensatory mitigation for impacts to other waters of the state, except where the approving agency explicitly identifies the mitigation as being of limited duration.
    b. Specifically identified in a water quality control plan as a wetland or other water of the state.
    c. Resulted from historic human activity, is not subject to ongoing operation and maintenance, and has become a relatively permanent part of the natural landscape.
    d. Greater than or equal to 1 acre in size unless the artificial wetland was constructed and is currently used and maintained, primarily for one or more of the following purposes: industrial or municipal wastewater treatment or disposal; settling of sediment; detention, retention, infiltration, or treatment of stormwater runoff and other pollutants or runoff subject to regulation under a municipal, construction, or industrial permitting program; treatment of surface waters; agricultural crop irrigation or stock watering; fire suppression; industrial processing or cooling water; active surface mining–even if the site is managed for interim wetlands functions and values; log storage; treatment, storage, or distribution of recycled water; maximizing groundwater recharge (this does not include wetlands that have incidental groundwater recharge benefits); or fields flooded for rice growing.

Wetlands that may not meet all of USACE's wetland delineation criteria are considered wetland waters of the state if, "under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation" (SWRCB 2019). Additionally, aquatic resources that USACE determines to not be waters of the United States because they lack a significant nexus to a traditional navigable water or are above the OHWM limit of federal jurisdiction, may also be considered waters of the state. If a CWA Section 404 permit is not required for a project, the RWQCB may still require a permit (waste discharge requirements) for impacts to waters of the state under the Porter–Cologne Act.

2.2.5 California Native Desert Plants Act

The purpose of the California Desert Native Plants Act (CDNPA) is to protect certain species of California desert native plants from unlawful harvesting on both public and privately owned lands. The CDNPA only applies within the boundaries of Imperial, Inyo, Kern, Los Angeles, Mono, Riverside, San Bernardino, and San Diego Counties. Within these counties, the CDNPA prohibits the harvest, transport, sale, or possession of specific native desert plants unless a person has a valid permit or wood receipt, and the required tags and seals. The appropriate permits, tags, and seals must be obtained from the sheriff or commissioner of the county where collecting will occur, and the county will charge a fee. More information on the CDNPA, including the species protected under the law, is available by reading the provisions of the law.

2.3 Local

2.3.1 San Bernardino County Policy Plan and Development Code

The County of San Bernardino General Plan contains the goals and policies that guide future development within San Bernardino County (County of San Bernardino 2007a). Although the project site is located in the City of Twentynine Palms, staff confirmed that the City relies on San Bernardino Development Code (County of San Bernardino 2007b) Chapter 88.01.060 for compliance with the Desert Native Plant Act. Chapter 88.01.060, Desert Native Plant Protection, of the San Bernardino County Development Code is a subset of the Plant Protection and Management Code (Chapter 88.01 of the Development Code) and focuses on the conservation of specified desert plant species. Chapter 88.01.060 specifically states "Removal of all plants protected or regulated by the Desert Native Plants Act (Food and Agricultural Code Section 80001 et seq.) shall comply with the provisions of the Act before the issuance of development permit or approval of a land use application. All members of the family Cactaceae (Cactus Family) require a permit for harvesting under the Desert Native Plants Act." This ordinance contains provisions for the protection of certain desert native plants as follows:

- The following desert native plants with stems two inches or greater in diameter or six feet or greater in height:
  - *Psorothamnus spinosus* (smoketree).
  - All species of the genus *Prosopis* (mesquites).
- All species of the family Agavaceae (century plants, nolinas, yuccas).
- Creosote Rings, 10 feet or greater in diameter.
- All Joshua trees.
- Any part of any of the following species, whether living or dead:
  - *Olneya tesota* (desert ironwood).
  - All species of the genus *Prosopis* (mesquites).
  - All species of the genus *Cercidium* (palo verdes).

Riparian Plant Conservation, Chapter 88.01.080 of the San Bernardino County Development Code, is a subset of the Plant Protection and Management Code that is focused on promoting the health of riparian corridors in relation to their impact on waterways within the region, their use as habitat by various plant and wildlife species, and their stabilization of stream banks.

San Bernardino County Soil and Water Conservation Code, Chapter 88.02 of the San Bernardino County Development Code, provides regulatory framework to promote the health of soil communities within the County, limit soil erosion potential, and preserve air quality. This code primarily regulates ground-disturbing activities within the County.

2.3.2 City of Twentynine Palms General Plan

The City's Land Use and Conservation and Open Space Elements (City of Twentynine Palms 2012) contain goals and policies that address biological resources. The following goals and policies pertain to biological resources and are relevant to the project:

Goal LU-5. Preserve Twentynine Palms natural resources and protect the public health, safety and general welfare of City residents in areas adjacent to potentially hazardous natural and man-made features and facilities.

Policy LU-5.1. Development standards for the General Plan Overlays shall be established to protect the area's natural resources and better protect the public's health, safety and general welfare.

Policy LU-5.3. Development within the General Plan Overlays shall be environmentally sensitive, minimize adverse environmental impacts, and enhance existing natural resources.

Goal LU-7. Protect and preserve Twentynine Palms natural resources, promote the existing quality of life and prepare future residents by promoting superior sustainable development.

Policy LU-7.2. Development shall be sustainable in its use of land and shall limit impacts to natural resources, energy, and air and water quality.

Goal CO-1. Designate, maintain and enhance the quality of permanently protected open space used by both endangered and special status species.

Policy CO-1.2. Require focused surveys for the burrowing owl for development projects on vacant properties, to determine the occurrence of burrowing owl and prepare mitigation measures if necessary.

Policy CO-1.5. Coordinate with federal and state agencies and private conservation organizations to preserve environmentally sensitive open space and conservation areas.

Policy CO-1.8. Encourage developers to preserve, protect and at a minimum salvage naturally occurring desert plant materials for incorporation into project landscaping to the greatest extent possible.

Policy CO-1.9. Encourage preservation and utilization of on-site indigenous materials on project landscape plans.

Goal CO-3. Develop policies and programs to ensure an adequate supply of high quality water.

Policy CO 3-8. Prepare and adopt development policies, which respect the biological values and dynamic nature of water movement on alluvial fans and leaves intermittent and perennial streams in a natural and unobstructed state.

2.3.3 Twentynine Palms Municipal Code

Article 4, Chapter 19.98 of the Twentynine Palms Municipal Code requires a take permit from CDFW prior to the removal, relocation, or trimming of any Western Joshua tree (*Yucca brevifolia*) or any part thereof.

3 Methods

Data regarding biological resources present within the 241.3-acre biological survey area (BSA), which includes the project site and off-site areas plus a 100-foot buffer, and the future road dedication areas, was obtained through review of pertinent literature. Field reconnaissance, vegetation mapping, and protocol/focused surveys were conducted within the BSA which are described in detail in this section. However, field reconnaissance and protocol-focused surveys were not conducted for the western extension of Samarkand Drive (outside the BSA) (refer to Section 1.1.2 of this report for details). For purposes of this report, special-status resources are defined as follows:

- Special-status plant species include the following:
  - Species designated as either rare, threatened, or endangered by CDFW or USFWS and are protected under either CESA (California Fish and Game Code Section 2050 et seq.) or FESA (16 USC 1531 et seq.)
  - Species that are candidate species being considered or proposed for listing under FESA or CESA
  - Species that are included on the CDFW Special Vascular Plants, Bryophytes, and Lichens List (CDFW 2024a), or species with a CRPR of 1 or 2 in the CNPS Inventory of Rare and Endangered Plants of California (CNPS 2023)
  - Species protected under the CDNPA
- Special-status wildlife species include the following:
  - Species designated as either rare, threatened, or endangered by CDFW or USFWS and are protected under either CESA (California Fish and Game Code Section 2050 et seq.) or FESA (16 USC 1531 et seq.)
  - Species that are candidate species being considered or proposed for listing under FESA or CESA
  - Other species that are included on the CDFW Special Animals List (CDFW 2024b) as Species of Special Concern
  - Species designated by California Fish and Game Code Section 4000 as fur-bearing mammals
- Special-status vegetation communities are those designated as sensitive by CDFW (CDFW 2024c)

3.1 Literature Review

Prior to conducting a reconnaissance-level field survey, Dudek biologists conducted a literature search and database review to evaluate the biological resources present or potentially occurring within the BSA. Special-status biological resources present or potentially present on the BSA were identified through a literature search using the following sources: IPaC records (USFWS 2023a), U.S. Fish and Wildlife Service (USFWS) Critical Habitat for Threatened & Endangered Species (USFWS 2024), the most recent versions of the CNDDB and special-status species lists (CDFW 2023, 2024a; 2024b), and the CNPS Inventory (CNPS 2023). Potential and/or historical drainages and aquatic features were investigated based on a review of site-specific topographical data, aerial photographs, the USFWS National Wetland Inventory database (USFWS 2023b), the USGS National Hydrography Dataset (USGS 2023), and the National Resources Conservation Service Web Soil Survey (USDA 2023). Additionally, the Hydrology and Hydraulic Technical Study (Dudek 2025) for the project was reviewed in the context of the potential jurisdictional aquatic resources within the BSA. Searches were completed for the following USGS 7.5-minute quadrangle maps (which include the quadrangles on which the BSA occurs and the eight surrounding

quadrangles): Deadman Lake SW, Lead Mountain SW, Deadman Lake SE, Twentynine Palms Mountain, Queen Mountain, Indian Cove, Twentynine Palms, Sunfair, and Valley Mountain.

3.2 Field Surveys within BSA

Dudek conducted the following biological surveys between April 2023 and June 2024 within the BSA: an aquatic resources delineation, vegetation mapping, a general habitat assessment, protocol-level presence/absence surveys for Mojave desert tortoise (*Gopherus agassizii*), a western Joshua tree (*Yucca brevifolia*) inventory survey, a desert native plant survey, a focused rare plant survey, and protocol surveys for burrowing owl (*Athene cunicularia*). Table 1 lists the dates, focus, scope, conditions, and personnel for each survey.

Table 1. Survey Conditions

Date	Biologists	Survey Area	Pass	Times	Weather Conditions
Aquatic Resources Delineation					
04/28/2023	Katie Dayton Zarina Pringle	BSA	N/A	6:57 a.m.–2:50 p.m.	68°F–92°F; 0% cloud cover; 0–4 mph wind
08/09/2023	Britney Schultz Luz Badillo Sarah Greely	BSA	N/A	6:05 a.m.–11:55 a.m.	79°F–95°F; 10–60% cloud cover; 0–1 mph wind
12/15/2023	Sarah Greely	BSA	N/A	8:12 a.m.–2:12 p.m.	46°F–68°F; 0% cloud cover; 0–3 mph wind
06/17/2024	Callie Amoaku Britney Schultz	BSA	N/A	8:38 a.m.–3:21 p.m.	81°F–98°F; 0% cloud cover; 0–9 mph wind
Vegetation Mapping/Habitat Assessment					
11/20/2023	Eilleen Salas Josh Elson Luz Badillo	BSA	N/A	9:42 a.m.–3:15 p.m.	55°F–63°F; 0–20% cloud cover; 2–8 mph wind
11/21/2023	Eilleen Salas Josh Elson Luz Badillo	BSA	N/A	8:00 a.m.–12:11 p.m.	56°F–65°F; 0% cloud cover; 0–3 mph wind
Mojave Desert Tortoise Protocol Survey					
12/07/2023	Eilleen Salas Josh Elson Luz Badillo Tara Merryman	BSA	N/A	8:47 a.m.–3:10 p.m.	56°F–70°F; 0% cloud cover; 1–4 mph wind
12/08/2023	Eilleen Salas Josh Elson Luz Badillo Sarah Greely Tara Merryman	BSA	N/A	7:43 a.m.–4:14 p.m.	52°F–61°F; 0% cloud cover; 0–2 mph wind

Table 1. Survey Conditions

Date	Biologists	Survey Area	Pass	Times	Weather Conditions
12/14/2023	Josh Elson Luz Badillo Tara Merryman	BSA	N/A	8:22 a.m.–3:15 p.m.	54°F–68°F; 0–40% cloud cover; 0–2 mph wind
12/15/2023	Josh Elson Luz Badillo Tara Merryman Valarie Goodwin	BSA	N/A	8:10 a.m.–11:44 a.m.	51°F–61°F; 10% cloud cover; 0–3 mph wind
Western Joshua Tree Survey					
12/11/2023	Aida Castro Ana Pfleeger Hansen LeClair Janette Ly	BSA	N/A	9:00 a.m.–1:00 p.m.	52°F–57°F; 0%–10% cloud cover; 0–2 mph wind
Desert Native Plant Survey					
03/21/2024	Alex Chaney Sandra Nash	BSA	N/A	7:02 a.m.–4:07 p.m.	54–79°F; 10% cloud cover; 2–7 mph wind
03/22/2024	Alex Chaney Sandra Nash	BSA	N/A	7:00 a.m.–4:00 p.m.	52–77°F; 30–90% cloud cover; 5–9 mph wind
03/26/2024	Alex Chaney Sandra Nash Dilip Mahto Sarah Mendez	BSA	N/A	10:42 a.m.–4:00 p.m.	63–70°F; 10–20% cloud cover; 2–6 mph wind
03/27/2024	Alex Chaney Sandra Nash Dilip Mahto Sarah Mendez	BSA	N/A	10:25 a.m.–4:10 p.m.	61–73°F2; 1–7 mph wind
03/28/2024	Sandra Nash Dilip Mahto Sarah Mendez	BSA	N/A	11:30 a.m.–3:10 p.m.	72–76°F; 0–20% cloud cover; 1–9 mph wind
03/29/2024	Alex Chaney Sandra Nash Dilip Mahto Sarah Mendez	BSA	N/A	7:45 a.m.–11:30 a.m.	48–65°F; 0–10% cloud cover; 0–5 mph wind
Rare Plant Survey					
04/02/2024	Marcelo Ceballos Jr. Sarah Greely Britney Schultz	BSA	N/A	8:30 a.m.–3:30 p.m.	61°F–74°F; 0% cloud cover; 1–4 mph wind
04/09/2024	Erin Bergman	BSA	N/A	9:22 a.m.–6:44 p.m.	69°F–72°F; 0% cloud cover; 0–5 mph wind
04/19/2024	Valerie Goodwin Britney Schultz	BSA	N/A	10:15 a.m.–3:30 p.m.	78°F–87°F; 0%–10% cloud cover; 0–1 mph wind

Table 1. Survey Conditions

Date	Biologists	Survey Area	Pass	Times	Weather Conditions
04/23/2024	Erin Bergman	BSA	N/A	10:02 a.m.–7:03 p.m.	77°F–83°F; 0% cloud cover; 0–2 mph wind
Burrowing Owl Survey					
03/26/2024	Alex Chaney Sandra Nash Dilip Mahto Sarah Mendez	BSA	Pass 1	6:34 a.m.–10:00 a.m.	52°F–61°F1; 8–10 mph wind
03/27/2024	Alex Chaney Sandra Nash Dilip Mahto Sarah Mendez	BSA	Pass 1	6:17 a.m.–9:59 a.m.	48°F–61°F; 0–10% cloud cover; 0–3 mph wind
03/28/2024	Sandra Nash Dilip Mahto Sarah Mendez	BSA	Pass 1	6:22 a.m.–10:00 a.m.	50°F–71°F; 10% cloud cover; 1–3 mph wind
03/29/2024	Alex Chaney Sandra Nash Dilip Mahto Sarah Mendez	BSA	Pass 1	6:30 a.m.–7:45 a.m.	48°F; 0% cloud cover; 0–3 mph wind
04/23/2024	Alex Chaney Sandra Nash Megan Minter Gerry Avila	BSA	Pass 2	6:07 a.m.–10:00 a.m.	63°F–77°F; 0% cloud cover; 1–3 mph wind
04/24/2024	Megan Minter Gerry Avila	BSA	Pass 2	8:25 a.m.–6:00 a.m.	50°F–70°F; 0% cloud cover; 1–3 mph wind
05/21/2024	Alex Chaney Megan Minter	BSA	Pass 3	5:40 a.m.–10:00 a.m.	65°F–73°F; 0% cloud cover; 0–3 mph wind
05/22/2024	Alex Chaney Sandra Nash Megan Minter	BSA	Pass 3	5:54 a.m.–10:05 a.m.	63–81°F; 0% cloud cover; 1–4 mph wind
07/01/2024	Alex Chaney Sandra Nash	BSA	Pass 4	5:30 a.m.–10:00 a.m.	73°F–91°F; 0% cloud cover; 1–4 mph wind
07/02/2024	Alex Chaney Sandra Nash	BSA	Pass 4	5:30 a.m.–10:00 a.m.	75°F–87°F; 0% cloud cover; 0–5 mph wind

Notes: N/A = not applicable; F = Fahrenheit; mph = miles per hour.

3.2.1 Vegetation Community and Land Cover Mapping

Dudek biologists conducted vegetation mapping within the BSA on November 20 and 21, 2023. The survey date, biologist, and weather conditions are included in Table 1. Dudek biologists used CDFW's Protocols for Surveying

and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (CDFW 2018) and California Natural Communities List (CDFW 2024c), also referred to as the Natural Communities List, based on A Manual of California Vegetation, Online Edition (CNPS 2024), to map the entire BSA. These classification systems focus on a quantified, hierarchical approach that includes both floristic (plant species) and physiognomic (community structure and form) factors as currently observed (as opposed to predicting climax or successional stages). Vegetation communities and land covers were delineated to the vegetation alliance level and, where appropriate, the association level. Some modifications, such as the Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986; Oberbauer et al. 2008), were incorporated to accommodate the lack of conformity of the observed communities to those included in these references.

Vegetation mapping was conducted on foot to visually cover 100% of the BSA. Vegetation communities were mapped in the field using an Esri ArcGIS mobile application. Vegetation communities were classified based on site factors, descriptions, distribution, and characteristic species present within an area. Information was recorded, including dominant species and associated cover classes, aspect, canopy height, and visible disturbance factors.

Minimum mapping units were established at 1 acre for upland communities not considered sensitive and 0.25 acres for sensitive vegetation communities and riparian and wetland vegetation communities (CDFW 2024c). Visible disturbance factors were also noted during vegetation mapping.

Following completion of the fieldwork, Dudek GIS analysts digitized the vegetation boundaries as delineated by the field biologists and created a GIS coverage for vegetation communities.

3.2.2 Flora

Latin and common names for plant species with a CRPR follow the CNPS Inventory of Rare Plant Inventory (CNPS 2022). For plant species without a CRPR, Latin names follow the Jepson Interchange List of Currently Accepted Names of Native and Naturalized Plants of California (Jepson Flora Project 2023), and common names follow the California Natural Communities list (CDFW 2024c) or the U.S. Department of Agriculture's Natural Resources Conservation Service PLANTS Database (USDA 2022).

3.2.3 Fauna

All wildlife species detected during the field surveys by sight, vocalizations, burrows, tracks, scat, or other signs were recorded. The site was visually scanned with and without binoculars to identify wildlife. Latin and common names of animals follow Crother (2017) for reptiles and amphibians, American Ornithological Society (AOS 2022) for birds, and Mammal Diversity Database (2023) for mammals.

3.2.4 Special-Status and Regulated Resources

3.2.4.1 Special-Status Plant Survey

Based on the results of the literature review discussed in Section 3.1, 12 special-status plant species were determined to have a moderate potential to occur within the BSA based on known species distribution, species-specific habitat preferences, and habitat conditions on site: California ayenia (*Ayenia compacta*), alkali mariposa-lily (*Calochortus striatus*), Rau's jaffueliobryum moss (*Jaffueliobryum raui*), Wright's jaffueliobryum moss (*Jaffueliobryum wrightii*), little San Bernardino Mountains linanthus (*Linanthus maculatus* ssp. *maculatus*),

spear-leaf matelea (*Matelea parvifolia*), Mojave menodora (*Menodora spinescens* var. *mohavensis*), appressed muhly (*Muhlenbergia appressa*), Latimer's woodland-gilia (*Saltugilia latimeri*), salt spring checkerbloom (*Sidalcea neomexicana*), jackass-clover (*Wislizenia refracta* ssp. *refracta*), and western Joshua tree. Therefore, focused surveys were conducted for these target species. In addition, desert native plants, in accordance with the California Desert Native Plants Act and Chapter 88.01.060, of the San Bernardino County Development Code, were also considered target species and are further discussed in Section 3.2.4.3, Desert Native Plant Survey.

Dudek conducted a focused special-status plant survey within the BSA on April 2, 9, 19, and 23, 2024. Field survey methods and mapping of rare plants conformed to the CNPS Botanical Survey Guidelines (CNPS 2001), Protocols for Surveying and Evaluating Impacts to Special-Status Native Populations and Natural Communities (CDFW 2018), and General Rare Plant Survey Guidelines (Cypher 2002). The surveys consisted of one survey pass in April that provided 100% coverage of the BSA. Western Joshua tree mapping was conducted during a separate focused survey and is further discussed in Section 3.2.4.2, Western Joshua Tree Focused Survey.

Reference Population Check

Before conducting the surveys, Dudek botanists conducted a literature search on reference population checks to ensure the focal special-status plant species were in bloom and identifiable. Numerous California ayenia occurrences were observed in San Diego County in April 2024; three alkali mariposa-lily occurrences were observed in San Bernardino County in May 2024; and numerous little San Bernardino Mountains linanthus occurrences were observed in San Bernardino County in April 2024 (iNaturalist 2024). It should be noted that western Joshua tree is a conspicuous tree that can be identified outside the blooming period. Furthermore, rainfall data for Twentynine Palms from July 2023 through May 2024 totaled approximately 3.94 inches of precipitation (AgACIS 2024). The average annual precipitation is 4.24 inches (WRCC 2024); therefore, the area received average precipitation totals for the rain year thus far, thereby indicating that surveys for special-status plant species adequately covered flora that are known to bloom within the vicinity.

3.2.4.2 Western Joshua Tree Focused Survey

Per the CDNPA and the Western Joshua Tree Conservation Act (WJTCA), Dudek's International Society of Arboriculture (ISA)–certified arborists performed a western Joshua tree survey to inventory and evaluate the health and relocation potential for each western Joshua tree located within the BSA. Dudek ISA-certified arborists walked the entire BSA in parallel transects to ensure documentation of each western Joshua tree within the BSA.

3.2.4.3 Desert Native Plant Survey

A desert native plant survey was conducted in April 2024 within the BSA in accordance with the CDNPA. The survey date, biologist, and weather conditions are included in Table 1. All of the desert native plant target species are conspicuous shrubs that would have been identifiable during the survey.

In accordance with the Chapter 88.01.060, Desert Native Plant Protection, of the San Bernardino County Development Code, the following desert native plants were considered target species:

- The following desert native plants with stems two inches or greater in diameter or six feet or greater in height:
  - *Psorothamnus spinosus* (smoketree).
  - All species of the genus *Prosopis* (mesquites).

- All species of the family Agavaceae (century plants, nolinas, yuccas).
- Creosote Rings, 10 feet or greater in diameter.
- All Joshua trees.
- Any part of any of the following species, whether living or dead:
  - *Olneya tesota* (desert ironwood).
  - All species of the genus *Prosopis* (mesquites).
  - All species of the genus *Cercidium* (palo verdes).

In accordance with the CDNPA, Chapter 3, the following desert native plants, or any part thereof, may not be harvested except under a permit issued by the commissioner or the sheriff of the county in which the native plants are growing:

A. All species of the family Agavaceae (century plants, nolinas, yuccas).
B. All species of the family Cactaceae (cacti), except for the plants listed in subdivisions (b) and (c) of Section 80072 which may be harvested under a permit obtained pursuant to that section.
C. All species of the family Fouquieriaceae (ocotillo, candlewood).
D. All species of the genus Prosopis (mesquites).
E. All species of the genus Cercidium (palos verdes).
F. *Acacia greggii* (catclaw).
G. *Atriplex hymenelytra* (desert-holly).
H. *Dalea spinosa* (smoke tree).
I. *Olneya tesota* (desert ironwood), including both dead and live desert ironwood.

3.2.4.4 Desert Tortoise Protocol-Level Survey

On April 2, 1990, the Mojave population of the desert tortoise was listed by USFWS as threatened (55 FR 12178-12191). There is no USFWS-designated critical habitat for listed wildlife species overlapping the BSA (USFWS 2023a, 2024). However, proposed actions within the range of the desert tortoise fall under purview of FESA. Because the project lies within the range for desert tortoise (Zeiner et al. 1990) and in the Western Mojave Recovery Unit (USFWS 2011), Dudek conducted a focused survey for desert tortoise to determine the status of the species on site. To evaluate the impacts to desert tortoise, a protocol survey was conducted in accordance with the Mojave Desert Tortoise Pre-Project Field Survey Protocol section included in Preparing for Any Action That May Occur within the Range of the Mojave Desert Tortoise (*Gopherus agassizii*) (USFWS 2019). Following the small project survey protocol, which states surveys can be completed at any time of year, Dudek biologists conducted surveys between December 7 and 15, 2023, for the BSA. Biologists surveyed the area by walking approximately 10-meter-wide transects for 100% coverage of the BSA.

3.2.4.5 Burrowing Owl Protocol-Level Survey

Dudek conducted protocol burrowing owl surveys within the BSA to determine the presence or absence of burrowing owl. These surveys were conducted in accordance with Appendix D of the Staff Report on Burrowing Owl Mitigation (CDFG 2012). The protocol states that four survey passes shall be performed, with the first visits occurring between

February 15 and April 15 and the remaining three visits, at least three weeks apart, between April 15 and July 15, with at least one visit after June 15.

Concurrent with the first pass of the burrowing owl surveys, Dudek biologists walked the entirety of the BSA to identify areas with suitable burrowing owl habitat (i.e., relatively open habitat with low gradients and burrow resources) and mapped all suitable burrows or burrow surrogates (i.e., ground-level cavities with openings of 4 inches in diameter or greater) using ESRI Collector. Following completion of the first survey pass, which included the burrow survey, polygons were drawn around large clusters of burrow resources to create a burrowing owl survey area. The remaining three survey passes were conducted within this refined burrowing owl survey area and completing using a combination of pedestrian transects spaced approximately 20 meters apart and spot checks where suitable burrows and the surrounding areas were investigated to determine the status of suitable burrows in these areas. To ensure accurate documentation of observations and prevent inadvertent flushing of potential individuals, the burrows and surrounding area were initially scanned from a distance using binoculars. Any burrowing owl individuals and status of the burrow were documented. If needed, the biologists carefully approached the burrowing owl survey area while scanning the area for burrowing owl individuals and investigating suitably sized burrows for any signs of activity. The use of pedestrian transects, or spot checks was determined in the field by the spatial distribution and density of suitable burrows or burrow features.

If observed, any direct observations (visual or audible) or active burrow sign (e.g., molted feathers, pellets, prey remains, whitewash) of burrowing owls was recorded. The surveys were conducted when conditions were suitable for detecting owls (no rain, high winds [greater than 20 mph], dense fog, or temperatures over 90°F). If observed, any burrowing owl sightings, occupied burrows, and burrows with burrowing owl sign were mapped and recorded.

3.2.4.6 Aquatic Resources Delineation

Before conducting fieldwork for the jurisdictional delineation, Dudek reviewed the USFWS National Wetlands Inventory (USFWS 2023b) to determine if the BSA contained any features mapped by the U.S. Fish and Wildlife Service. Site-specific topographical data was reviewed in conjunction with, both current and historical, aerials (Google Earth 2023), to determine the potential presence of non-wetland waters. Current vegetation mapping was reviewed to assess whether the BSA supported hydrophytic vegetation and potential wetlands. No areas within the BSA supported hydrophytic vegetation, and therefore wetland data station forms were not completed. The surveys were conducted on foot to visually cover the BSA. Jurisdictional boundaries were mapped in the field using ESRI Collector on a mobile device with submeter accuracy. Remote sensing was not used for the delineation. Additionally, the Hydrology and Hydraulic Technical Study (Dudek 2024) for the project was reviewed in the context of the potential jurisdictional aquatic resources within the BSA.

Dudek conducted a delineation of state and federal jurisdictional waters and wetlands within the BSA in accordance with current policies. Federal wetlands were mapped based on the procedures in the Corps of Engineers Wetlands Delineation Manual (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (USACE 2008a). Non-wetland waters were mapped at the OHWM based on the procedures defined in A Field Guide to the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (USACE 2008b). In addition, each of the potential non-wetland waters within the BSA was evaluated to determine all features are ephemeral using the Beta Streamflow Duration Assessment Method for the Arid West (SDAM) (Mazor et al. 2023) and the Mapping Episodic Stream Activity (MESA) guidelines (Brady 2013). Waters of the state were mapped in accordance with the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (SWRCB 2021). CDFW jurisdictional areas were mapped to include

the bank of the stream/channel and outer dripline of adjacent riparian vegetation, as set forth under California Fish and Game Code Section 1602. Streambeds under the jurisdiction of CDFW were delineated using the Cowardin method of waters classification, which defines waters boundaries by a single parameter (i.e., hydric soils, hydrophytic vegetation, or hydrology) (Cowardin et al. 1979). CDFW also regulates riparian vegetation communities that occur beyond the limits of regulated streambeds.

To aid in the delineation and in conformance with the USACE 2008 Field Guide, eleven OHWM data sheets (OHMW-T-1 through T-11), four SDAM data sheets (SDAM-T-1 through SDAM-T-4), and eight MESA data sheets (MESA-T-1 through MESA-T-8) were recorded at potential non-wetland waters within the BSA to determine the OHWM indicators within those features and to determine all features are ephemeral. All forms are included in Appendix B, Aquatic Resources Delineation Report.

The limits of aquatic resources were collected in the field using a Trimble R1 GPS unit and ESRI Field Maps mobile application with sub-meter accuracy. The geographic extents were digitized in a GIS based on the GPS data and data collected directly onto field maps into a project-specific GIS using ArcGIS software.

3.2.5 Survey Limitations

Limitations of the surveys include a diurnal bias and the absence of trapping for reptiles, amphibians, and small mammals at night. The surveys were conducted during the daytime to maximize the detection of most wildlife. Most birds are active in the daytime, so diurnal surveys maximize the number of bird observations. Conversely, diurnal surveys usually result in few observations of mammals, many of which may only be active at night. In addition, many species of reptiles and amphibians are secretive in their habits and are difficult to observe using standard meandering transects.

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4 Environmental Setting

The purpose of this section is to describe the general existing conditions within and adjacent to the BSA to document the baseline conditions for this report and subsequent analysis.

4.1 Land Use

The BSA consists of open/vacant land located approximately 1.5 miles north of the Twentynine Palms Highway (SR-62). The BSA has not undergone any major land use changes since the mid-1990s. Active off-road-vehicle use by unknown third parties occurs within the ephemeral washes of the BSA.

The surrounding area is predominantly rural undeveloped land. Undeveloped land is located immediately to the south with single-family residential homes located approximately one-half mile south of the BSA. The area east of the BSA is vacant land, with the closest residences approximately 1,500 feet from the BSA. The Desert Congregational Church is located approximately one-half mile southeast, at the intersection of Two Mile Road and Sunrise Road. Properties north and west of the BSA are vacant undeveloped land.

4.2 Climate

The BSA is located in the Morongo Basin/High Desert region in San Bernardino County. Average annual temperatures in the Twentynine Palms area range from 52°F to 84°F; average annual snowfall is 0.7 inches; and the average annual precipitation is 4.24 inches (WRCC 2024).

4.3 Topography

The natural topography of the BSA slopes toward the north and northeast with elevations ranging from approximately 2,350 feet above mean sea level in the southwestern portion of the BSA to approximately 2,060 feet above mean sea level in the drainage crossing the northernmost part of the BSA (Google Earth 2023). The BSA forms the southern slope of a valley, with the area to the north sloping upwards from south to north and reaching similar elevations to those found in the southern portion of the BSA. The surrounding area follows this topographical trend.

4.4 Soils

According to the U.S. Department of Agriculture's Natural Resource Conservation Service's Web Soil Survey, no existing soil data is available for the BSA (USDA 2023). Soils observed within the BSA during field surveys conducted by Dudek were generally sandy/gravelly soils.

4.5 Watersheds and Hydrology

The BSA is within the Southern Mojave Subbasin, Hydrologic Unit Code 8 (18100100), and within Indian Cove–Rattlesnake Canyon sub-watershed Hydrologic Unit Code 12 (181001001802) of the Mesquite Lake watershed Hydrologic Unit Code 10 (1810010018) (Figure 3, Hydrologic Setting). The Southern Mojave subbasin comprises

approximately 8,867 square miles and spans both San Bernardino and Riverside Counties. The primary geographic and surface hydrologic feature of the watershed is the Mojave River, which flows northeast from the San Bernardino Mountains for approximately 100 miles until it reaches its terminus at Soda Lake near the community of Baker. Some reaches of the Mojave River flow underground in the confined riverbed channel. The Mojave River is approximately 70 miles southeast of the BSA. No drainages within the BSA flow to the Mojave River. The Mesquite Lake watershed comprises 60 square miles (63,450.75 acres) and is partially within the City of Twentynine Palms in San Bernardino County (USGS 2023).

There are no perennial streams within the Mesquite Lake watershed, and most water features only flow ephemerally in response to storms. Runoff is primarily generated in the surrounding mountains but is quickly lost as recharge to the mountain front alluvial deposits, leading to very little surface flow leaving this area (Troxell 1954). A substantial amount of runoff that does pass the mountain front area and reaches the basins is then lost to evaporation (Kennedy/Jenks/Todd LLC 2007). The San Bernardino and Little San Bernardino Mountains represent a large surface water divide, with channels on the north and east sides of the ranges tributary to the Great Basin, and channels on the south and west sides tributary to the Pacific Ocean (Troxell 1954). The BSA contains several ephemeral drainages that ultimately end in the various playa lakes, meaning that surface water is confined within the basins. In the event of an extraordinary stormflow, water may reach Dale Dry Lake, a dry playa just east of Twentynine Palms (Thompson 1929).

5 Results

This section describes the results of the literature review and field surveys within the 241.3-acre BSA.

5.1 Vegetation Communities and Land Covers

A total of six vegetation communities and land cover types were mapped in the BSA. The spatial distribution of the vegetation communities and land covers are presented on Figure 4, Vegetation Communities and Land Covers. The acreages of the mapped vegetation alliances/associations and other land covers in the BSA are presented in Table 2.

CDFW state rankings of 1, 2, or 3 are considered sensitive and impacts to these communities typically require mitigation. The following vegetation community within the BSA has a CDFW ranking of 3 and is therefore considered special status: desert willow–smoketree wash woodland. Vegetation communities considered sensitive biological resources by CDFW under CEQA (CDFW 2024c) are noted in Table 2 with an asterisk. Photos of the BSA can be found in Appendix C, Photo Documentation.

5.1.1 Creosote Bush–White Bursage Scrub (33.140.00)

The creosote bush–white bursage scrub alliance communities include white bursage scrub (*Ambrosia dumosa*) and creosote bush (L*arrea tridentata*) as co-dominant shrubs in the canopy. Creosote bush–white bursage scrub have a two-tiered, open to intermittent canopy less than 3 meters (9.8 feet) in height with a ground layer that is absent to intermittent with seasonal annuals (CNPS 2024). Species associated with the Creosote bush–white bursage scrub alliance include branched pencil cholla (*Cylindropuntia ramosissima*), desert holly (*Atriplex hymenelytra)*, *Ephedra* species, *Krameria* species, and paperbag bush (*Salazaria mexicana*).

The creosote bush–white bursage scrub alliance is ranked by the CDFW (2024d) as a G5S5 alliance. This ranking indicates that globally and within California the alliance is considered secure (CDFW 2024c; NatureServe 2024).

The associations within the creosote bush–white bursage scrub alliance mapped on-site are *Larrea tridentata–Ambrosia dumosa–Krameria (erecta, grayi)* and *Larrea tridentata–Ambrosia dumosa–Ambrosia salsola.* Neither association is ranked as sensitive by CDFW (2024d).

On site, *Larrea tridentata–Ambrosia dumosa–Ambrosia salsola* comprises a medium patch on the southwestern portion of the BSA. Associated species observed within this association in the field included cheesebush, creosote bush, bursage scrub, ephedra species, and Branched pencil cholla. *Larrea tridentata–Ambrosia dumosa–Krameria (erecta, grayi)* comprises most of the BSA and off-site improvement areas. Associated species observed within this association in the field included creosote bush, bursage scrub, and white rhatany.

Table 2. Vegetation Communities and Land Cover Types Within the BSA

Vegetation Community or Land Cover Type	Alliance	Association	Ranking[1]	Project-Level (Acres)			Future Road Dedications (Acres)			BSA Total[3]
				Project Site[2]	Off-Site	100-Foot Buffer	Amboy Road	Noels Knoll Road	Samarkand Drive	
Scrub										
Creosote Bush–White Bursage Scrub	*Larrea tridentata–Ambrosia dumosa*	*Larrea tridentata–Ambrosia dumosa–Krameria (erecta, grayi)*	G5S5	165.1	3.3	39.6	2.0	3.1	2.4	212.1
	Larrea tridentata–Ambrosia dumosa	*Larrea tridentata–Ambrosia dumosa–Ambrosia salsola*	G5S5	2.8	0	1.1	0	0	0.1	3.9
Cheesebush–Sweetbush Scrub	*Ambrosia salsola–Bebbia juncea*	*Ambrosia salsola–Larrea tridentata*	G4S4	12.2	0	2.3	0.4	0.2	<0.1	14.5
			Scrub Subtotal[3]	*180.1*	*3.3*	*43.2*	*2.4*	*3.3*	*2.4*	*230.7*
Riparian										
Desert Willow–Smoketree Wash Woodland*	*Chilopsis linearis–Psorothamnus spinosus*	*Psorothamnus spinosus*	G4G5 S3	4.0	0	2.2	0.3	0.4	0	6.2
			Riparian Subtotal[3]	*4.0*	*0*	*2.2*	*0.3*	*0.4*	*0*	*6.2*
Disturbed and Developed										
Disturbed Habitat	N/A	N/A	N/A	<0.1	<0.1	0.1	0	<0.1	1.8	1.9
Urban/ Developed	N/A	N/A	N/A	0	<0.1	2.7	0	0	0	2.7

Table 2. Vegetation Communities and Land Cover Types Within the BSA

Vegetation Community or Land Cover Type	Alliance	Association	Ranking[1]	Project-Level (Acres)			Future Road Dedications (Acres)			BSA Total[3]
				Project Site[2]	Off-Site	100-Foot Buffer	Amboy Road	Noels Knoll Road	Samarkand Drive	
Disturbed and Developed Subtotal[3]				*<0.1*	*<0.1*	*2.7*	*0*	*<0.1*	*1.8*	*4.6*
Total[3]				**184.0**	**3.3**	**48.0**	**2.7**	**3.6**	**4.3**	**241.3**

Source: CDFW 2024c.

Notes:

1 The conservation status of a vegetation community is designated by a number from 1 to 5, preceded by a letter reflecting the appropriate geographic scale of the assessment (G = global, N = national, and S = subnational). The numbers have the following meaning (NatureServe 2024):
1 = critically imperiled
2 = imperiled
3 = vulnerable to extirpation or extinction
4 = apparently secure
5 = demonstrably widespread, abundant, and secure
N/A = not applicable
GNR = unranked, global rank not yet assessed
SNA = unranked, subnational rank not yet assessed

2 Note this column includes the acreage of future road dedications that overlap the project site.

3 Totals do not sum due to overlap between the project site and the Future Road Dedication areas.

* Community is sensitive under CEQA and listed by California Department of Fish and Wildlife as sensitive (i.e., State Rank [S] 1, 2, or 3) (CDFW 2024c).

5.1.2 Cheesebush–Sweetbush Scrub (33.200.00)

The cheesebush–sweetbush scrub alliance communities include cheesebush (*Ambrosia salsola*), sweetbush (*Bebbia juncea*), woolly brickellbush (*Brickellia incana*), and/or desert senna (*Senna armata*) as the dominant or co-dominant shrub in the canopy. Shrubs have an open to intermittent canopy less than 2 meters (6.6 feet) in height with a sparse or seasonally present ground layer (CNPS 2024). Species associated with the cheesebush–sweetbush scrub alliance include Wiggin's cholla (*Cylindropuntia echinocarpa)*, brittlebush, California buckwheat (*Eriogonum fasciculatum*), California joint fir (*Ephedra californica*), and purple sage (*Salvia dorrii).*

The cheesebush–sweetbush alliance is ranked by the CDFW (2024d) as a G4S4 alliance. This ranking indicates that the alliance is apparently secure both globally and within California (CDFW 2024c; NatureServe 2024).

The only association within the cheesebush–sweetbush scrub alliance mapped on-site is *Ambrosia salsola–Larrea tridentata.*

On site, cheesebush–sweetbush scrub occurs in one large and one small patch in the northeastern portion of the BSA. Another large patch transects the middle of the BSA from north to south. Associated species observed within this alliance in the field included creosote bush and cheesebush.

5.1.3 Desert-Willow–Smoketree Wash Woodland (61.555.00)

Desert-willow–smoketree wash woodland alliance communities include desert willow (*Chilopsis linearis)* and/or smoke tree as the dominant or co-dominant tree or tall shrub in the canopy. Desert-willow–smoketree wash woodland has an open to intermittent tree canopy less than 8 meters (26.2 feet) in height with an open to intermittent shrub layer and a sparse to seasonally abundant herbaceous layer of annuals (CNPS 2024). Species associated with the desert-willow–smoketree wash woodland alliance include cheesebush (*Ambrosia Salsola*), ironwood (*Olneya tesota*), western Joshua tree, Mojave rabbitbrush (*Ericameria paniculata*), and sweetbush (*Bebbia juncea*). The only association within the desert-willow–smoketree wash woodland alliance mapped on site is *Psorothamnus spinosus*.

The desert-willow–smoketree wash woodland alliance is ranked by the CDFW (2024d) as a G4S3 alliance. This ranking indicates that the alliance is apparently secure globally but vulnerable to extirpation or extinction within California (CDFW 2024c; NatureServe 2024). Therefore, this alliance is considered a sensitive natural community by CDFW.

On site, desert-willow–smoketree wash woodland occurs in a medium linear patch that stretches diagonally along the northwestern corner of the BSA and a small patch in the northeastern portion. Associated species observed within this alliance in the field included smoketree, creosote bush, and cheesebush.

5.1.4 Disturbed Habitat

Disturbed habitat land covers refer to areas that have been physically disturbed (by previous legal human activity) and are no longer recognizable as a native or naturalized vegetation association, but that continue to retain a soil substrate. If vegetation is present, it is typically composed of non-native plant species such as ornamentals or ruderal exotic species that take advantage of disturbance (Oberbauer et al. 2008).

Disturbed habitat is not a listed vegetation community under the California Natural Community List (CDFW 2024c), but it has been used in this report because it best describes what was observed in the field. As such, this community is not globally, or state ranked and is not considered a sensitive natural community under CEQA.

On site, disturbed habitat comprises an east–west trending dirt road, representing an undeveloped portion of Samarkand Drive, that runs along the southern boundary of the BSA.

5.1.5 Urban and Developed

Urban or developed land covers refer to areas that have been constructed on or otherwise physically altered to the point where vegetation is no longer present. Urban or developed areas are characterized by permanent or semi-permanent structures, hardscapes, and landscaped areas that require irrigation (Oberbauer et al. 2008).

Urban or developed land is not a listed vegetation community under the California Natural Community List (CDFW 2024c), but it has been used in this report because it best describes what was observed in the field. As such, this community is not globally, or state ranked and is not considered a sensitive natural community under CEQA.

Within the BSA, the urban/developed land cover consists of Two Mile Road, an off-site paved road, and a section of the nearby Southern California Edison Carodean Substation.

5.2 Plants and Wildlife Observed

5.2.1 Plants

A total of 104 species of native or naturalized plants, 99 native (95%) and 5 non-native (5%), were recorded within the BSA. A list of observed plant species observed is provided in Appendix D, Plant Compendium.

5.2.2 Wildlife

A total of 38 wildlife species, consisting of 37 native species (97%) and one non-native species (domestic dog) (3%), were recorded within the BSA or vicinity during surveys (Appendix E, Wildlife Compendium).

Birds detected on or within the vicinity of the BSA included California species of special concern loggerhead shrike (*Lanius ludovicianus*) and vermilion flycatcher (*Pyrocephalus rubinus*). Additionally, more common bird species found within the BSA include house finch (*Haemorhous mexicanus*), common raven (*Corvus corax*), Gambel's quail (*Callipepla gambelii*), blue-gray gnatcatcher (*Polioptila caerulea*), mourning dove (*Zenaida macroura*), black-throated sparrow (*Amphispiza bilineata*), Bell's sparrow (*Artemisiospiza belli*), and white-crowned sparrow (*Zonotrichia leucophrys*). Mammals detected include coyote (*Canis latrans*), domestic dog (*Canis familiaris*), black-tailed jackrabbit (*Lepus californicus*), and desert cottontail (*Sylvilagus audubonii*). Reptiles detected included federally and state listed Mojave Desert tortoise. Additional reptiles observed included zebra-tailed lizard (*Callisaurus draconoides*), desert horned lizard (*Phrynosoma platyrhinos*), western fence lizard (*Sceloporus occidentalis*), common side-blotched lizard (*Uta stansburiana*), western banded gecko (*Coleonyx variegatus*), tiger whiptail (*Aspidoscelis tigris*), desert iguana (*Dipsosaurus dorsalis*), coachwhip (*Coluber flagellum*), gophersnake (*Pituophis catenifer*), and sidewinder (*Crotalus cerastes*). Common invertebrates observed included painted lady (*Vanessa cardui*), sleepy orange (*Eurema nicippe*), dainty sulphur (*Nathalis iole*), cloudless sulphur (*Phoebis sennae*), and checkered white (*Pontia protodice*). All other species observed are listed in Appendix E.

5.3 Special-Status and Regulated Resources

Appendix F and Appendix G provide tables of all special-status species (plants and wildlife, respectively) whose geographic ranges fall within the general BSA vicinity. Special-status species' potential to occur within the BSA were evaluated based on known species distribution, species-specific habitat preferences, and Dudek biologists' knowledge of regional biological resources. Species potentially occurring within the BSA are identified as having moderate or high potential to occur based on habitat conditions on site, and species for which there is little or no suitable habitat are identified as not expected to occur or having low potential to occur.

5.3.1 Special-Status Plants

Special-status plants include those listed, or candidates for listing, as threatened or endangered by USFWS and CDFW, and species with a CRPR of 1 or 2. Dudek biologists performed an extensive desktop review of literature, existing documentation, and GIS data to evaluate the potential for special-status plant species to occur within the BSA. Each special-status plant species was assigned a rating of "not expected," "low," "moderate," or "high" potential to occur based on relative location to known occurrences, vegetation community, soil, and elevation.

Listed species with any potential to occur and non-listed special-status species with a moderate or higher potential to occur are discussed herein. Those special-status plant species that occur in the region but are not expected or have low potential to occur in the BSA due to a lack of suitable habitat, the BSA being located outside the species' known geographic or elevation range, or not being observed during the focused 2024 special-status plant survey are also included in Appendix F; however, these species are not discussed further because no significant direct or indirect impacts to them are expected. In addition, there is no USFWS-designated critical habitat for listed plant species overlapping the BSA (USFWS 2023a, 2024).

Based on the results of the literature review and database searches, 21 special-status plant species were reported in the CNDDB and CNPS databases as occurring in the nine USGS 7.5-minute quadrangles containing and surrounding the BSA. Of these, 12 species were determined to have a moderate to high potential to occur based on suitable soils and vegetation communities present within the BSA and historical occurrences: California ayenia, alkali mariposa-lily, Rau's jaffueliobryum moss, Wright's jaffueliobryum moss, little San Bernardino Mountains linanthus, spear-leaf matelea, Mojave menodora, appressed muhly, Latimer's woodland-gilia, salt spring checkerbloom, jackass-clover, and western Joshua tree. Therefore, focused surveys for these species were conducted in April 2024. No special-status plant species, including the target species, were observed during the 2024 survey. These target species are discussed in further detail in Appendix F and their potential to occur has been updated based on the results of 2024 special-status plant focused surveys. There were no additional special-status plant species that were determined to have a moderate or high potential to occur within the BSA, based on the soils, vegetation communities (habitat) present, elevation range, and previous known locations based on the CNDDB and CNPS Inventory (Appendix F).

Two CRPR 4.2 species, Utah vine milkweed (*Funastrum utahense*) and Thurber's beardtongue (*Penstemon thurberi*), and one CRPR 4.3 species, Joshua Tree poppy (*Eschscholzia androuxii*), were observed during the 2024 special-status plant focused surveys. These species were not included as a target species for the 2024 focused surveys because they are either CRPR 4.2 or CRPR 4.3 species. Species with CRPR 4 are not considered rare, but only limited in distribution or infrequent throughout a broader range in California (e.g., "Watch List" species) (CNPS 2023a).

Desert Native Plants

The BSA includes 4,562 desert native plant species which were mapped during the desert native plant survey (Figure 5, California Desert Native Plant Act Survey Results). These species consisted of silver cholla (*Cylindropuntia echinocarpa*), branched pencil cholla (*Cylindropuntia ramosissima*), cottontop cactus (*Echinocactus polycephalus* var. *polycephalus*), California barrel cactus (*Ferocactus cylindraceus*), beavertail pricklypear (*Opuntia basilaris* var. *basilaris*), Mojave yucca (*Yucca schidigera*), smoke tree (*Psorothamnus spinosus*), and catclaw acacia (*Senegalia greggii*). No western Joshua trees were observed within the BSA during the desert native plant surveys or the western Joshua tree focused survey.

5.3.2 Special-Status Wildlife

Special-status wildlife include those listed, or candidates for listing, as threatened or endangered by USFWS and CDFW, and those designated as fully protected or species of special concern by CDFW and as sensitive by USFWS. Similar to special-status plants, Dudek biologists performed an extensive desktop review of literature, existing documentation, and GIS data to evaluate the potential for special-status wildlife species to occur within the BSA. Each special-status wildlife species was assigned a rating of "not expected," "low," "moderate," or "high" potential to occur based on relative location to known occurrences and vegetation community/habitat association. Listed species with any potential to occur and non-listed special-status species with a moderate or higher potential to occur are discussed herein. Those special-status wildlife species that are not expected or have low potential to occur in the BSA are also included in Appendix G; however, these species are not discussed further as no significant direct or indirect impacts are expected.

Based on the results of the literature review and database searches, 21 special-status wildlife species were reported in the CNDDB and USFWS databases as occurring in the vicinity of the BSA. Of these 21 species, two special-status wildlife species were determined to have a moderate or high potential to occur within the BSA based on habitat present and/or the BSA's proximity to previous known locations in CNDDB records: burrowing owl and Mojave desert tortoise; therefore, focused surveys for these species were conducted. Protocol-level surveys for Mojave desert tortoise were positive. Burrowing owl sign (i.e., pellets) and suitable burrows were observed, however, no burrowing owl individuals or active (i.e., recent) sign were observed during the 2024 focused surveys. These species, in addition to the species observed and those with the potential to occur within the BSA, are detailed in the following discussion. The details for these species are presented below in Table 3A.

There is no USFWS-designated critical habitat for listed wildlife species overlapping the BSA (USFWS 2023a, 2024).

Table 3A. Special-Status Wildlife Species Observed or with Moderate or High Potential to Occur Within the BSA

Scientific Name	Common Name	Status (Federal/State)	Habitat	Potential to Occur
Athene cunicularia (burrow sites and some wintering sites)	burrowing owl	BCC/SSC, SCE	Nests and forages in grassland, open scrub, and agriculture, particularly with ground squirrel burrows	**Moderate potential to occur.** There is open scrub present for overwintering individuals. Burrowing owl sign (i.e., pellets) was observed at one burrow located within the northwestern portion of the BSA. The BSA

Table 3A. Special-Status Wildlife Species Observed or with Moderate or High Potential to Occur Within the BSA

Scientific Name	Common Name	Status (Federal/State)	Habitat	Potential to Occur
				contains numerous suitable burrows that did not contain burrowing owl sign. No burrowing owls were observed during the 2024 focused surveys.
Gopherus agassizii	Mojave desert tortoise	FT/ST	Arid and semi-arid habitats in Mojave and Sonoran Deserts, including sandy or gravelly locations along riverbanks, washes, sandy dunes, canyon bottoms, desert oases, rocky hillsides, creosote flats, and hillsides	**Observed**. Active sign (i.e., scat, burrow, carcass) and individuals were observed within the BSA during the 2023 Desert Tortoise-focused surveys and during other field surveys conducted in 2023 and 2024 (refer to Table 3B below for additional observation details).
Lanius ludovicianus (nesting)	loggerhead shrike	None/SSC	Nests and forages in open habitats with scattered shrubs, trees, or other perches	**Observed.** Suitable nesting and foraging habitat occur within the BSA. This species was observed immediately outside the 100-foot buffer.
Pyrocephalus rubinus (nesting)	vermilion flycatcher	None/SSC	Nests in riparian woodlands, riparian scrub, and freshwater marshes; typical desert riparian with cottonwood, willow, mesquite adjacent to irrigated fields, ditches, or pastures	**Observed.** Suitable foraging habitat occurs within the BSA. This species is not known to nest within the vicinity. This species was observed foraging and perching on a Mojave yucca within the northwestern portion of the site.
Vulpes macrotis arsipus	desert kit fox	None/None[1]	Sparse vegetated scrub habitats such as creosote scrub communities that support abundant rodent populations (Center for Biological Diversity 2013).	**Moderate potential to occur**. The BSA contains sparse desert scrub habitats such creosote scrub; however, areas surrounding the BSA are conducive to stray dogs and further limit desert kit fox habitat potential in the area. Desert kit fox sign (i.e., tracks) was observed during the 2024 burrow surveys.

Status Designations
Federal
BCC: U.S. Fish and Wildlife Service Bird of Conservation Concern
FT: Federally listed as threatened
State
SSC: California Species of Special Concern
SSE: State Candidate for listing as endangered

ST: State listed as threatened
Notes: BSA = biological survey area.
[1] Although desert kit fox is not considered listed by the USFWS or CDFW under any special-status designation, this species is considered a "fur-bearing mammal," protected from take under the California Fish and Game Commission's Mammal Hunting Regulations (Subdivision 2, Chapter 5), which effectively protects it from take.

Mojave Desert Tortoise

Desert tortoise is a federally and state-listed threatened species. The range of the Mohave population of the desert tortoise includes portions of the Mojave Desert and the Colorado Desert in Southern California (parts of Inyo, Kern, Los Angeles, San Bernardino, and Riverside Counties), southern Nevada (Clark, Esmeralda, Nye, and Lincoln Counties), northwestern Arizona (Mohave County), and southwestern Utah (Washington County).

Typical habitat for desert tortoise in the Mojave Desert is creosote bush scrub where precipitation ranges from 2 to 8 inches, with relatively high diversity of perennial plants and high productivity of ephemeral plants. Throughout most of the Mojave Desert, desert tortoises occur most commonly on gently sloping terrain with sandy gravel soils and where there is sparse cover of low-growing shrubs, which allows for the establishment of herbaceous plants. Soils must be friable enough for digging burrows, but firm enough that burrows do not collapse (USFWS 2008). Although populations of desert tortoise are not generally known to inhabit elevations much above 4,000 feet above mean sea level, they occur from below sea level to an elevation of 7,300 feet above mean sea level. Occupied habitat varies from flats and slopes dominated by creosote bush scrub at low elevations, to rocky slopes in blackbrush and juniper woodland ecotones at higher elevations (USFWS 2008).

The 2023 Mojave desert tortoise protocol-level surveys conducted within the BSA were positive for desert tortoise individuals and desert tortoise presence (occupancy) was confirmed. Active suitable burrows were present with desert tortoise sign such as scat, burrows, as well as one bone fragment and one carcass observed. Figure 6A, Desert Tortoise Protocol Survey Results and Incidental Observations, depicts the 2023 Mojave desert tortoise protocol-level survey results as well as additional incidental desert tortoise individual and/or desert tortoise sign observations mapped during other field survey efforts in 2023 and 2024. Specifically, 13 Class 1 burrows, meaning that burrows were considered currently active and occupied, with desert tortoise or recent sign were mapped. Fifteen Class 2 burrows were mapped, meaning burrows were of good condition, confirmed desert tortoise burrow; however, no evidence of recent use observed. Eight Class 3 burrows were mapped, meaning deteriorated condition which included collapsed burrow and confirmed desert tortoise burrow. Additionally, 23 Class 4 and 5 burrows were mapped, meaning they were of good or deteriorated condition and possible desert tortoise burrow. Desert tortoise data sheets can be found in Appendix H, Desert Tortoise Forms.[9] Table 3B summarizes the live individuals observed during both the 2023 protocol-level surveys and incidental observations that occurred during other field survey efforts in 2023 and 2024. Locations and dates for each live desert tortoise observation, separated by protocol-level survey observations and incidental observations, are shown on Figure 6B, Desert Tortoise Live Individuals. Note that each individual observation does not necessarily signify a different individual tortoise. Additional protocol-level surveys are planned in 2025 during the desert tortoise's most active periods (April through May or September through October) to provide a more accurate count of the specific number of individual desert tortoises within the BSA.

[9] Desert tortoise forms include only those burrows and live tortoises mapped during the 2023 protocol survey efforts; additional burrows and live tortoises incidentally mapped during the 2023 aquatic resources delineation and 2024 focused burrowing owl surveys are not included in the forms as they were not part of the desert tortoise protocol-level surveys. However, all desert tortoise burrows and live desert tortoise observations from 2023 and 2024 are included on Figures 6A and 6B, respectively.

Table 3B. Live Desert Tortoise Individuals Observed within the BSA

Date	Observation Notes	Live Individuals
Mojave Desert Tortoise Protocol Survey		
12/07/2023	No live tortoises were detected during this survey.	0
12/08/2023	All individuals were observed within burrows at 2 locations (i.e., two individuals were located within one burrow and 1 individual was located in a separate burrow).	3
12/14/2023	No live tortoises (one carcass observed) were detected during this survey.	0
12/15/2023	No live tortoises were detected during this survey.	0
	Protocol Survey Total	*3*
Incidental Observations		
08/09/2023	Three individuals observed: two within burrows and one walking/foraging.	3
03/21/2024	One subadult (6 inches) observed resting under pencil cholla.	1
03/26/2024	Three individuals observed: one within burrow, one resting, one walking.	4
03/27/2024	Three individuals observed foraging and resting.	3
03/29/2024	One individual observed.	1
04/23/2024	One individual observed resting on dirt road.	1
05/21/2024	One individual observed within a burrow.	1
07/02/2024	Two individuals observed, each within separate burrows.	2
	Incidental Observations	*16*
	Total Live Tortoise Observations	**19**

Burrowing Owl

Burrowing owl is a USFWS bird of conservation concern and a candidate for listing under CESA. With a relatively wide-ranging distribution throughout the west, burrowing owls are considered to be habitat generalists (Lantz et al. 2004). In California, burrowing owls are yearlong residents of open, dry grassland and desert habitats, and in grass, forb and open shrub stages of pinyon-juniper and ponderosa pine habitats (Zeiner et al. 1990). Preferred habitat is generally typified by short, sparse vegetation with few shrubs, level to gentle topography, and well-drained soils (Haug et al. 1993).

The presence of burrows is the most essential component of burrowing owl habitat as they are required for nesting, roosting, cover, and caching prey (Coulombe 1971; Martin 1973; Green and Anthony 1989; Haug et al. 1993). In California, western burrowing owls most commonly live in burrows created by California ground squirrels (*Spermophilus beecheyi*). Burrowing owls may occur in human-altered landscapes such as agricultural areas, ruderal grassy fields, vacant lots, and pastures if the vegetation structure is suitable (i.e., open and sparse); usable burrows are available; and foraging habitat occurs in close proximity (Gervais et al. 2008). Debris piles, riprap, culverts, and pipes can be used for nesting and roosting.

Burrowing owl has moderate potential to occur within the BSA. During the 2024 focused surveys, burrowing owl sign (i.e., pellets) was observed at one burrow within the northwestern portion of the BSA. Numerous suitable burrows were observed; however, no burrowing owl sign was observed. No burrowing owl individuals were observed during the surveys. No California ground squirrels were observed within the BSA during surveys. Burrow locations are shown on Figure 7, Burrowing Owl Survey Results.

Loggerhead Shrike

Loggerhead shrike is a California Species of Special Concern. It is widespread throughout the United States, Mexico, and portions of Canada (Humple 2008). The species is a yearlong resident in most of the United States, including from California east to Virginia and south to Florida, and in Mexico. In California, while shrikes are widespread at the lower elevations in the state, the largest breeding populations are located in portions of the Central Valley, the Coast Ranges, and the southeastern deserts (Humple 2008).

Preferred habitats for loggerhead shrikes are open areas that include scattered shrubs, trees, posts, fences, utility lines, or other structures that provide hunting perches with views of open ground, as well as nearby spiny vegetation or human-made structures (such as the top of chain-link fences or barbed wire) that provide a location to impale prey items for storage or manipulation (CDFW 2024d; Humple 2008). Loggerhead shrikes occur most frequently in riparian areas along the woodland edge, grasslands with sufficient perch and butcher sites, scrublands, and open canopied woodlands, although they can be quite common in agricultural and grazing areas, and can sometimes be found in mowed roadsides, cemeteries, and golf courses. Loggerhead shrikes occur only rarely in heavily urbanized areas. For nesting, the height of shrubs and presence of canopy cover are most important (Yosef 1996).

Loggerhead shrike was observed during biological surveys along the northern boundary of the BSA.

Vermilion Flycatcher

Vermilion flycatcher is a California Species of Special Concern. This species is a rare, yearlong resident along the lower Colorado River Valley, especially in vicinity of Blythe in Riverside County (CDFW 2024d; Myers 2008). Small, scattered breeding populations are also known from southern desert areas in the Imperial, Morongo, and Yucca Valleys (Myers 2008). Its range during the winter fluctuates with winter conditions; in some winters, the species wanders along river corridors outside its normal range (Grinnell and Miller 1944). This species nests in cottonwood, willow, mesquite, and other vegetation in desert riparian habitat adjacent to irrigated fields, irrigation ditches, pastures and other open, mesic areas in isolated patches throughout central southern California (CDFW 2024d).

One vermilion flycatcher was observed, during a survey in March 2024, foraging and perching on a Mojave yucca within the northwestern portion of the BSA.

Desert Kit Fox

Although desert kit fox is not considered listed by the USFWS or CDFW under any special-status designation, this species is considered a “fur-bearing mammal,” protected from take under the California Fish and Game Commission’s Mammal Hunting Regulations (Subdivision 2, Chapter 5), which effectively protects it from hunting and trapping pressure. No hunting or trapping is proposed or would be allowed under the proposed project. However, project implementation would not be allowed take of this species. Desert kit fox lives in the open desert, on creosote bush flats, and amongst sand dunes. The BSA includes suitable desert scrub including creosote bush flats, and larger areas of open scrub. Desert kit fox has a moderate potential to occur within the BSA due to the presence of suitable habitat and sign (i.e., tracks) observed during the 2024 burrow surveys and potentially suitable burrows are shown on Figure 7.

5.3.3 Potential Jurisdictional Aquatic Resources

The jurisdictional aquatic resources delineation identified 7.39 acres of potential jurisdictional aquatic resources that are summarized in Table 4 and shown on Figure 8, Jurisdictional Aquatic Resources. These features are under

RWQCB and CDFW jurisdiction, however, no features within the BSA are regulated by USACE given (1) that they are ephemeral and temporary in nature and are not permanent, standing, or continuously flowing bodies of water, and (2) their lack of downstream connection to a traditional navigable water. Areas of streambeds that overlap the desert-willow–smoketree wash woodland vegetation community were classified as CDFW riparian habitat.

Table 4. Potential Jurisdictional Aquatic Resources Within the BSA

Feature Name	Total Acreage[1]
Non-Wetland Water (RWQCB)/Streambed (CDFW)	
NWW-1	0.91
NWW-1a	1.18
NWW-1b	0.72
NWW-1c	0.80
NWW-1d	0.74
Streambed Subtotal	*4.35*
Non-Wetland Water (RWQCB)/Riparian Habitat (CDFW)	
NWW-1	2.33
NWW-1c	0.71
Riparian Habitat Subtotal	*3.04*
Total	**7.39**

Notes: RWQCB = Regional Water Quality Control Board; CDFW = California Department of Fish and Wildlife; NWW = non-wetland water.
[1] Totals may not sum precisely due to rounding.

The BSA occurs within an alluvial fan, a landform typically associated with episodic sediment transport and deposition within a system of braided channels. Geologic mapping (Dibblee 1968) shows that the BSA is underlain by "Older Alluvium" which is an erosion resistant unit exposed in a topographically higher position than the thin, discontinuous veneer of recently transported "Recent Alluvium" deposits observed on aerial photographs as an apparent network of braided channels. However, field surveys found a number of swale features created from sheet flow runoff that lack evidence of sediment deposition, continuous fluvial features such as channel banks, floodplain or bar surfaces, and/or bankfull. Many of these swale features appear on aerial photographs but are actually sandy off-highway vehicle tracks or relic features that did not exhibit recent fluvial activity. Therefore, due to the presence of the older alluvium and lack of fluvial indicators, these relic swale features were not mapped as watercourses. Furthermore, the Hydrology and Hydraulic Technical Study (Dudek 2025) for the project was reviewed in the context of the potential jurisdictional aquatic resources within the BSA.

The ultimate decision on the amount and location of jurisdictional resources is made by the resource agencies (i.e., USACE, CDFW, and RWQCB), and, therefore, potential aquatic resources may increase or decrease. See Appendix B for further descriptions of these resources.

5.4 Wildlife Corridors and Habitat Linkages

Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the migration of animals. Wildlife corridors contribute to population viability by ensuring continual exchange of genes between populations, providing access to adjacent habitat areas for foraging and mating, and providing routes for recolonization of habitat after local extirpation or ecological catastrophes (e.g., fires).

Habitat linkages are small patches that join larger blocks of habitat and help reduce the adverse effects of habitat fragmentation. Habitat linkages provide a potential route for gene flow and long-term dispersal of plants and animals and may also serve as primary habitat for smaller animals, such as reptiles and amphibians. Habitat linkages may be continuous habitat or discrete habitat islands that function as steppingstones for dispersal. The BSA occurs within multiple established wildlife corridors and/or habitat linkage areas as described in detail below and shown on Figure 9, Wildlife Corridors and Habitat Linkages.

The BSA is mapped within a desert tortoise core linkage, burrowing owl patch linkage, and is approximately 800 feet to the east of a bighorn sheep "less than patch" linkage as designated by the California Desert Linkage Network (Penrod et al. 2012) with access provided through CDFW's Biogeographic Information and Observation System (BIOS) (CDFW 2024e) (Figure 9). A desert tortoise core linkage is a potentially continuous area of suitable habitat large enough to support and sustain at least 50 desert tortoise individuals for several generations (Penrod et al. 2012). A burrowing owl patch is defined as suitable habitat large enough to support a breeding pair of burrowing owls (Penrod et al. 2012). A bighorn sheep "less than patch" are areas that are smaller than both the core areas and patches. The BSA is also mapped as a CDFW Area of Conservation Emphasis (ACE), Rank 1 (CDFW 2024f) (Figure 9). According to CDFW (2019), ACE Rank 1 is defined as:

> ACE Rank 1: Limited connectivity opportunity. Areas where land use may limit options for providing connectivity (e.g., agriculture, urban) or no connectivity importance has been identified in models. Includes lakes. Some DOD [Department of Defense] lands are also in this category because they have been excluded from models due to lack of conservation opportunity, although they may provide important connectivity habitat.

Additionally, Exhibit CO-3 of the City's General Plan Conservation and Open Space Element shows the BSA overlapping a Wildlife Linkage Area (City of Twentynine Palms 2012). The mapping on this exhibit is based on the potential movement corridors for bobcat and additional habitats required to meet their needs identified in *A Linkage Design for the Joshua Tree-Twentynine Palms Connection* (Penrod et. al. 2008). The portion of the corridor that the BSA overlaps is mapped as low and moderate permeability with no areas of high permeability in this particular corridor (refer to Figure 9 in Penrod et al. 2008).

Summary

The BSA is currently undeveloped land located within the established habitat linkage areas for desert tortoise and burrowing owl that would allow for viable populations of smaller terrestrial species and/or species' dispersal movements through the BSA and the vicinity. As further described in Appendix G of this report, larger mammal species (e.g., bighorn sheep and mountain lion) are not anticipated to use the BSA or immediate vicinity due to the openness of the site (e.g., lack of escape terrain for bighorn sheep, lack of rocky outcrops, dense brush, or steep terrain preferred by mountain lion), which doesn't provide enough cover for these species (i.e., the BSA is located outside any bighorn sheep linkages). This also applies for larger mammal species that are not considered special-status wildlife, such as bobcat (*Lynx rufus*), in that the openness of the site (e.g., lack of steep terrain preferred by bobcat). Additionally, the BSA has a limited connectivity opportunity (ACE Rank 1) and therefore would not be considered a significant regional wildlife corridor. Therefore, in summary, the BSA provides live-in habitat for desert tortoise and other small terrestrial species but is not anticipated to significantly contribute to regional movement of larger species through the surrounding habitat.

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6 Project Impacts

This chapter addresses direct and indirect impacts to biological resources that would result from implementation of the project, provides the significance determinations for proposed or potential impacts, and proposes mitigation.

6.1 Explanation of Findings of Significance

Impacts to special-status vegetation communities, plant and wildlife species, and jurisdictional waters, including wetlands, must be quantified and analyzed to determine whether such impacts are significant under CEQA. CEQA Guidelines Section 15064(b) states that an ironclad definition of "significant" effect is not possible, because the significance of an activity may vary with the setting. CEQA Guidelines Appendix G, however, does provide "examples of consequences which may be deemed to be a significant effect on the environment" (14 CCR 15064[e]). These effects include substantial effects on rare or endangered species of animal or plant or the habitat of the species. CEQA Guidelines Section 15065(a) is also helpful in defining whether a project may have a significant effect on the environment. Under that section, a proposed project may have a significant effect on the environment if the project has the potential to (1) substantially degrade the quality of the environment, (2) substantially reduce the habitat of a fish or wildlife species, (3) cause a fish or wildlife population to drop below self-sustaining levels, (4) threaten to eliminate a plant or animal community, (5) reduce the number or restrict the range of a rare or endangered plant or animal, or (6) eliminate important examples of a major period of California history or prehistory.

The following are the significance thresholds for biological resources provided in the CEQA Guidelines Appendix G Environmental Checklist, which states that a project would potentially have a significant effect if it would do any of the following:

Impact BIO-1	Has a substantial adverse effect, 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.
Impact BIO-2	Has a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by CDFW or USFWS.
Impact BIO-3	Has a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
Impact BIO-4	Interferes substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impedes the use of native wildlife nursery sites.
Impact BIO-5	Conflicts with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
Impact BIO-6	Conflicts with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

The evaluation of whether an impact to a particular biological resource is significant must consider both the resource itself and the role of that resource in a regional context. Substantial impacts are those that contribute to, or result in, permanent loss of an important resource, such as a population of a special-status plant or wildlife species. Impacts may be important locally because they result in an adverse alteration of existing site conditions but considered not significant because they do not contribute substantially to the permanent loss of that resource regionally. The severity of an impact is the primary determinant of whether that impact can be mitigated to a level below significance.

6.2 Definition of Impacts

This section addresses potential impacts (permanent, temporary, direct, and indirect), as defined below, to special-status biological resources that could result from implementation of the project. CEQA significance threshold and potential impacts are discussed on Section 6.3, Impacts Analysis, and applicable mitigation measures are presented in Chapter 7, Mitigation.

For the purposes of this analysis, impacts were evaluated separately for the "Project-Level" (i.e., project site including on—site access roads and PV installation area and off-site gen-tie and access road alignment), and for the "Future Road Dedications" (i.e., City requested future extensions of Samarkand Drive, Amboy Road, and Noels Knoll Road). It should be noted that mitigation for biological resource impacts within the Future Road Dedications will only be implemented if and when these roads are built.

6.2.1 Project-Level Impacts

Permanent Impacts result in the permanent long-term loss of a biological resource (e.g., loss of suitable habitat for special-status plant and wildlife species). Permanent impacts associated with the proposed project include the installation of the solar arrays, on-site substation, solar facility access roads, two bridges (i.e., bridge abutments), perimeter fencing, along with construction of the off-site access road and gen-tie line.

Temporary Impacts refer to areas directly and indirectly impacted for the duration of construction only. Temporary impacts associated with the project include a 14-foot work area for the off-site underground gen-tie line installation along the northside of Two Mile Road and for the on-site gen-tie trench work area, and a 5-foot temporary construction easement on the west and east side of the proposed off-site access road.

Direct Impacts include the alteration, disturbance, or destruction of biological resources that would result from project-related activities. Direct impacts can include temporary impacts, such as the disturbance or removal of vegetation that returns to pre-activity conditions, or permanent impacts, which could result, for example, from construction of the solar facility arrays, on-site substation, on-site and off-site access roads and associated bridge abutments.

Indirect Impacts are reasonably foreseeable effects caused by project implementation on biological resources outside the area of direct impact (usually the limits of work areas). Indirect impacts may include increased human activity, elevated noise and dust levels, and chemical pollutant spills. Indirect impacts may be short-term and construction-related, or long-term and associated with development in proximity to biological resources.

Cumulative impacts refer to the combined environmental effects of a project and other relevant projects. These impacts may be minor when analyzed individually but become collectively significant as they occur over time. Cumulative impacts are addressed in the project's environmental impact report.

6.2.2 Future Road Dedication Impacts

Permanent Impacts result in the permanent long-term loss of a biological resource (e.g., loss of suitable habitat for special-status plant and wildlife species). The Future Road Dedications are not currently proposed to be constructed, as there are other parcels in between the existing roads and the site where the roads would need to be constructed for the extensions adjacent to the site to be serviceable. The proposed roads are not required by the project and are not proposed to be utilized by the project. Nevertheless, because the requested dedications make road construction reasonably foreseeable, the future construction of Amboy Road, Noels Knoll Road, and Samarkand Drive are characterized as a permanent impact to represent the worst-case scenario.

Temporary Impacts refer to areas directly and indirectly impacted for the duration of construction only. No temporary impacts are currently proposed for the Future Road Dedications.

Direct Impacts include the alteration, disturbance, or destruction of biological resources that would result from project-related activities. Direct impacts can include permanent impacts, which could result, for example, from construction of the Future Road Dedications

Indirect Impacts are reasonably foreseeable effects caused by project implementation on biological resources outside the area of direct impact (usually the limits of work areas). Indirect impacts may include increased human activity, elevated noise and dust levels, and chemical pollutant spills. Indirect impacts may be short-term and construction-related, or long-term and associated with development in proximity to biological resources.

Cumulative impacts refer to the combined environmental effects of a project and other relevant projects. These impacts may be minor when analyzed individually but become collectively significant as they occur over time. Cumulative impacts are addressed in the project's environmental impact report.

The evaluation of project impacts is organized below using Appendix G of the CEQA Guidelines.

6.3 Impacts Analysis

A total of 143.9 acres, specifically 142.2 acres of permanent impacts and 1.8 acres of temporary impacts, would be impacted with Project-Level implementation and a total of 11.7 acres would be permanently impacted by the Future Road Dedications as summarized in Table 5A. The acreage of Project-Level impacts to vegetation communities and land cover types is provided in Table 5B and the acreage of Future Road Dedication impacts to vegetation communities and land cover types is provided in Table 5C. Figure 10, Impacts to Vegetation Communities and Land Covers, depicts the areas where permanent and temporary impacts to vegetation communities and land cover types are anticipated to occur for both the Project-Level impacts and the Future Road Dedication impacts.

Table 5A. Project-Level and Future Road Dedication Impact Summary (Acres)

Impact Location	Permanent Impact	Temporary Impact
Project-Level		
Project Site Impacts		
Access Roads	9.0	0
PV Installation Area	131.4	0
Gen-Tie Trench Work Area	0	<0.1
Substation	0.2	0
Project Site Impacts Subtotal	*140.6*	*<0.1*
Off-Site Impacts		
Gen-Tie Interconnection Pole Footprint	<0.1	0
Gen-Tie Trench Installation/Two Mile Road	0	1.1
Gen-Tie/Access Road Alignment and Gen-Tie Trench Work Area	1.6	0.6
Off-Site Impacts Subtotal	*1.6*	*1.7*
Project-Level Total[1]	**142.2**	**1.8**
Future Road Dedications		
Amboy Road	*2.7*	0
Noels Knoll Road	*3.6*	0
Samarkand Drive (within BSA)	*4.3*	0
Samarkand Drive (outside BSA)	*1.0*	0
Future Road Dedication Total[1]	**11.7**	**0**

Notes: Future Road Dedication impacts are separated from the Project-Level impacts as they are not required by the project and are not proposed to be utilized by the project.

[1] Totals may not sum due to rounding.

Source: CDFW 2024c.

Table 5B. Project-Level Impacts to Vegetation Communities and Land Cover Types

Vegetation Community or Land Cover Type	Alliance	Association	Ranking[1]	Project Site (acres)		Off-Site (acres)		Total Impacts (acres)
				Permanent	Temporary	Permanent	Temporary	
Scrub								
Creosote Bush–White Bursage Scrub	*Larrea tridentata–Ambrosia dumosa*	*Larrea tridentata–Ambrosia dumosa–Krameria (erecta, grayi)*	G5S5	139.1	<0.1	1.5	1.7	142.4
	Larrea tridentata–Ambrosia dumosa	*Larrea tridentata–Ambrosia dumosa–Ambrosia salsola*	G5S5	0.1	0	0	0	0.1
Cheesebush–Sweetbush Scrub	*Ambrosia salsola–Bebbia juncea*	*Ambrosia salsola–Larrea tridentata*	G4S4	1.4	0	0	0	1.4
		Scrub Subtotal[2]		*140.6*	*<0.1*	*1.5*	*1.7*	*143.9*
Riparian								
Desert Willow–Smoketree Wash Woodland*	*Chilopsis linearis–Psorothamnus spinosus*	*Psorothamnus spinosus*	G4G5 S3	0	0	0	0	0
		Riparian Subtotal[2]		*0*	*0*	*0*	*0*	*0*
Disturbed and Developed								
Disturbed Habitat	N/A	N/A	N/A	0	0	<0.1	<0.1	<0.1
Urban/Developed	N/A	N/A	N/A	0	0	<0.1	<0.1	<0,.1
		Disturbed and Developed Subtotal[2]		*0*	*0*	*<0.1*	*<0.1*	*<0.1*
		Total[2]		**140.6**	**<0.1**	**1.6**	**1.7**	**143.9**

Notes:

[1] The conservation status of a vegetation community is designated by a number from 1 to 5, preceded by a letter reflecting the appropriate geographic scale of the assessment (G = global, N = national, and S = subnational). The numbers have the following meaning (NatureServe 2024):
1 = critically imperiled
2 = imperiled
3 = vulnerable to extirpation or extinction
4 = apparently secure
5 = demonstrably widespread, abundant, and secure
N/A = not applicable
GNR = unranked, global rank not yet assessed

SNA = unranked, subnational rank not yet assessed
2 Totals may not sum due to rounding.
* Community is sensitive under CEQA and listed by California Department of Fish and Wildlife as sensitive (i.e., State Rank [S] 1, 2, or 3) (CDFW 2024c).

Table 5C. Future Road Dedication Permanent Impacts to Vegetation Communities and Land Cover Types (Acres)

Vegetation Community or Land Cover Type	Alliance	Association	Ranking[1]	Amboy Road	Noels Knoll Road	Samarkand Drive–Within BSA	Samarkand Drive–Outside BSA[2]
Scrub							
Creosote Bush–White Bursage Scrub	*Larrea tridentata–Ambrosia dumosa*	*Larrea tridentata–Ambrosia dumosa–Krameria (erecta, grayi)*	G5S5	2.0	3.1	2.4	0.6
	Larrea tridentata–Ambrosia dumosa	*Larrea tridentata–Ambrosia dumosa–Ambrosia salsola*	G5S5	0	0	0.1	0
Cheesebush–Sweetbush Scrub	*Ambrosia salsola–Bebbia juncea*	*Ambrosia salsola–Larrea tridentata*	G4S4	0.4	0.2	<0.1	0
			Scrub Subtotal[2]	*2.4*	*3.3*	*2.5*	*0.6*
Riparian							
Desert Willow–Smoketree Wash Woodland*	*Chilopsis linearis–Psorothamnus spinosus*	*Psorothamnus spinosus*	G4G5 S3	0.3	0.4	0	0
			Riparian Subtotal[2]	*0.3*	*0.4*	*0*	*0*
Disturbed and Developed							
Disturbed Habitat	N/A	N/A	N/A	0	<0.1	1.8	0.4
Urban/Developed	N/A	N/A	N/A	0	0	0	0
			Disturbed and Developed Subtotal[2]	*0*	*<0.1*	*1.8*	*0.4*
			Total[3]	**2.7**	**3.6**	**4.3**	**1.0**

Notes:
1 The conservation status of a vegetation community is designated by a number from 1 to 5, preceded by a letter reflecting the appropriate geographic scale of the assessment (G = global, N = national, and S = subnational). The numbers have the following meaning (NatureServe 2024):
1 = critically imperiled
2 = imperiled
3 = vulnerable to extirpation or extinction

4 = apparently secure
5 = demonstrably widespread, abundant, and secure
N/A = not applicable
GNR = unranked, global rank not yet assessed
SNA = unranked, subnational rank not yet assessed

[2] Dudek conducted vegetation mapping through a combination of a desktop analysis and using aerial signatures from within the BSA where field surveys were completed. Totals may not sum due to rounding.

* Community is sensitive under CEQA and listed by California Department of Fish and Wildlife as sensitive (i.e., State Rank [S] 1, 2, or 3) (CDFW 2024c).

6.3.1 Impact BIO-1: Special-Status Species

6.3.1.1 Impacts to Special-Status Plants

6.3.1.1.1 Direct Impacts

Project-Level Impacts

Focused surveys for special-status plants conducted in 2024 as a part of the proposed project were negative for special-status plants. As such, no special-status plants are expected to occur within the BSA. Therefore, **no direct impacts** to special-status plant species are anticipated and no avoidance or compensatory mitigation measures are required.

The project site does not occur within federally designated critical habitat for special-status plant species. Therefore, no impacts to critical habitat would occur with project implementation.

Three non-listed special-status plant species, Joshua Tree poppy, Utah vine milkweed, and Thurber's beardtongue were observed within the BSA. These species were not included as a target species for the 2024 focused surveys because they are either CRPR 4.2 or CRPR 4.3 species. Species with CRPR 4 are not considered rare, but only limited in distribution or infrequent throughout a broader range in California (e.g., "Watch List" species) (CNPS 2023a). Thus, given that CEQA requires findings of significance for projects that "threaten to … reduce the number or restrict the range of a rare or endangered plant," these three species are not analyzed further.

Future Road Dedication Impacts

Within BSA

Direct impacts to special-status plants from the Future Road Dedication areas would be the same as Project-Level impacts. Therefore, **no direct impacts** to special-status plant species are anticipated and no avoidance or compensatory mitigation measures are required.

Outside BSA

Focused surveys for special-status plants were not conducted outside the BSA for Samarkand Drive. Future development outside the BSA has the potential to result in direct impacts to special-status plants, including California ayenia, alkali mariposa-lily, Rau's jaffueliobryum moss, Wright's jaffueliobryum moss, little San Bernardino Mountains linanthus, spear-leaf matelea, Mojave menodora, appressed muhly, Latimer's woodland-gilia, salt spring checkerbloom, jackass-clover, and western Joshua tree, through clearing, trampling, or grading, if present. Any potential impact to a federal- or state-listed plant species would be significant. Potential impacts to non-listed special-status plants from future development are potentially significant depending on the location and size of the impact. Project implementation of **Mitigation Measure (MM) BIO-1** (Future Road Dedication Focused Surveys, Avoidance, and Mitigation Outside BSA) would reduce potential direct impacts to a less-than-significant level through focused special-status plant surveys, avoidance and minimization measures, a salvage and relocation plan, and/or compensatory mitigation to comply with CEQA. Therefore, direct impacts to special-status plant species would be **less than significant with mitigation incorporated**.

6.3.1.1.2 Indirect Impacts

Project-Level Impacts

Construction-Related

Potential short-term or temporary indirect impacts to special-status plant species resulting from construction activities include inadvertent spillover impacts, including unintentional clearing, trampling, or grading outside the project footprint; generation of fugitive dust; changes in hydrology resulting from construction, including sedimentation and erosion; and the release of chemical pollutants. These potential construction-related indirect impacts to off-site special-status plant species would be potentially significant absent mitigation.

Project implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) would reduce potential indirect impacts during construction to a less-than-significant level by requiring implementation of biological monitoring and a Worker Environmental Awareness Program (WEAP) Training that will cover the special-status resources and mitigation requirements for the project; delineation of project boundaries; implementation of standard dust control measures; completion and approval of a stormwater pollution prevention plan (SWPPP); and ensuing toxicants are not discharged. With implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources), the effect of construction-related indirect impacts to off-site special-status plant species would be minimized to **less than significant with mitigation incorporated.**

Long-Term

Potential long-term indirect impacts that could result from operations and maintenance of the solar facility near off-site special-status plant species or their suitable habitat would be chemical releases such as oils and grease from vehicles that could degrade habitat; increased invasive plant species that may degrade habitat; and trampling of vegetation and soil compaction by humans, which could affect soil moisture, water penetration, surface flows, and erosion. These potential long-term indirect impacts to off-site special-status plant species would be potentially significant absent mitigation.

The solar facility will be operated on an unstaffed basis and monitored remotely, with on-site personnel visitations for security, maintenance, and system monitoring on an as-needed and likely in-frequent basis. However, project implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) would reduce potential long-term indirect impacts to a less-than-significant level by requiring measures to ensure runoff is not altered from existing conditions and toxicants are not discharged; application of a native seed mix to promote passive restoration of temporary impact areas that does not include species from the California Invasive Plant Council (Cal-IPC) California Invasive Plant Inventory; and incorporation of perimeter fencing to prevent operations and maintenance staff access to areas outside of the project that may result in trampling of vegetation and soil compaction of potential off-site habitat for special-status plants. With implementation of **MM-BIO-2**, the effect of long-term indirect impacts to special-status plant species would be minimized to **less than significant with mitigation incorporated.**

Future Road Dedication Impacts

Within BSA

Indirect impacts to special-status plants from the Future Road Dedication areas would be the same as Project-Level impacts. With implementation of **MM-BIO-2**, the effect of construction-related and long-term indirect impacts to special-status plant species would be minimized to **less than significant with mitigation incorporated.**

Outside BSA

Focused surveys for special-status plants were not conducted outside the BSA for Samarkand Drive. Future development outside the BSA has the potential to result in indirect impacts to special-status plants, including California ayenia, alkali mariposa-lily, Rau's jaffueliobryum moss, Wright's jaffueliobryum moss, little San Bernardino Mountains linanthus, spear-leaf matelea, Mojave menodora, appressed muhly, Latimer's woodland-gilia, salt spring checkerbloom, jackass-clover, and western Joshua tree. Indirect impacts to special-status plants outside the BSA would be the same as Project-Level impacts. With implementation of **MM-BIO-2**, the effect of construction-related and long-term indirect impacts to special-status plant species outside the BSA would be minimized to **less than significant with mitigation incorporated.**

6.3.1.2 Impacts to Special-Status Wildlife

A total of five special-status wildlife species were observed or determined to have a moderate potential to occur within the BSA based on known species distribution, species-specific habitat preferences, and habitat conditions on the BSA: Mojave Desert tortoise, loggerhead shrike, vermilion flycatcher, and desert kit fox, and burrowing owl.

The BSA does not occur within federally designated critical habitat for special-status wildlife species. Therefore, no impacts to critical habitat would occur with project implementation.

6.3.1.2.1 Direct Impacts

Project-Level Impacts

Mojave Desert Tortoise

Mojave Desert tortoise individuals and sign were observed within impact areas of the BSA during the protocol-level surveys as well as during other field surveys conducted for the project in 2023 and 2024 (Figures 11A and 11B). A total of 142.1 acres of suitable desert scrub habitat would be permanently impacted and 1.7 acres of suitable desert scrub habitat would be temporarily impacted by the proposed project (Table 5B). Suitable habitat impact totals do not include impacts to disturbed habitat and urban/developed land cover types. Occupied habitat is defined as areas that include the presence of either live tortoises or tortoise sign (burrows, scats, and carcasses) and areas within the BSA that are comprised with similar habitats and that may be affected directly or indirectly with implementation of the project. Even though neither tortoises nor tortoise sign were found within some portions of the BSA at the time of the survey, the area may reasonably be part of tortoise's home range. The annual home range of a female desert tortoise averages around 35 to 40 acres, about one third the size of male home ranges, which are variable, and a home range of a male desert tortoise can be greater than 500 acres (USFWS 2009). Given the homogeneity of the vegetative and topographic resources, desert tortoises would be expected to have potential to occupy the entire site. The vast majority of threats to the desert tortoise or its habitat are associated

with human land uses, including habitat loss and fragmentation, that either directly or indirectly affect desert tortoise (USFWS 2011). Habitat loss is defined in the Revised Recovery Plan for the Mojave Population of the Desert Tortoise (USFWS 2011) as the complete removal (i.e., grading of the landscape) of food and shelter resources necessary for desert tortoise occupation. Habitat fragmentation resulting from new roads or solar energy facilities can inhibit desert tortoise movement (USFWS 2011). Therefore, direct impacts to Mojave Desert tortoise individuals and occupied habitat from the proposed project would be considered significant absent mitigation.

Direct impacts to desert tortoise individuals would be avoided through implementation of **MM-BIO-3** (Desert Tortoise Avoidance and Minimization Measures), which would require permanent desert tortoise exclusion fencing around the project site and temporary fencing along the access road during construction, and **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources), which would require biological monitoring and WEAP training. All temporary impact areas shall be recontoured to natural grade and revegetated with application of a native seed mix in accordance with **MM-BIO-2**. The application of a native seed mix would promote passive restoration of temporary impact areas and restore suitable desert tortoise habitat to near pre-project conditions. Permanent impacts to occupied desert tortoise habitat would be mitigated at a 1:1 ratio in accordance with **MM-BIO-4** (Desert Tortoise Habitat Compensatory Mitigation). Compensatory mitigation can help contribute to land acquisitions that ensure landscape-level conservation and habitat connectivity reducing the potential for fragmentation, as well as assisting in recovery efforts (USFWS 2011). The project applicant shall also be required to obtain an Incidental Take Permit (ITP) from CDFW under Section 2081 of California Fish and Game Code and from the USFWS under Section 7 and/or Section 10 of the Endangered Species Act, as directed by **MM-BIO-4**. Therefore, direct impacts to Mohave Desert tortoise would be **less than significant with mitigation incorporated**.

Burrowing Owl

No burrowing owl were detected during the 2024 protocol burrowing owl surveys. However, as shown on Figure 12, one suitable burrow contained sign (i.e., pellet); however, this burrow is located outside of the project-level impact area. Numerous inactive burrows were observed within the impact area of the BSA during surveys as depicted on Figure 12 and burrowing owls are a transient species and have the potential to occupy the site prior to initiation of construction activities. Adult burrowing owls can reside below ground and therefore are susceptible to injury and mortality during construction activities. CDFW has determined the following activities have the potential to take burrowing owls, their nests or eggs, or destroy or degrade burrowing owl habitat: grading, disking, cultivation, earthmoving, burrow blockage, heavy equipment compacting and crushing burrow tunnels (CDFG 2012). Therefore, direct impacts from implementation of the proposed project to burrowing owl individuals and potentially occupied habitat would be significant absent mitigation.

Pursuant to the California Fish and Game Code and MBTA, a pre-construction survey in compliance with the Staff Report on Burrowing Owl Mitigation (CDFG 2012) would be necessary to reevaluate the locations of potential burrowing owl burrows within the project site so that take of owls and/or active owl nests are avoided. The Staff Report on Burrowing Owl Mitigation (CDFG 2012) outlines the most effective manner for conducting surveys to determine burrowing owl presence according to scientific literature and field experience supports the determination of timing for the surveys. Consistent with **MM-BIO-5** (Pre-Construction Burrowing Owl Surveys and Avoidance), a pre-construction survey for burrowing owls would be conducted in areas supporting potentially suitable habitat and within 14 days prior to the start of construction activities. If burrowing owl is not observed during the pre-construction survey, no further mitigation would be required.

As further described in **MM-BIO-5**, if burrowing owls are detected, and if impacts to burrowing owl cannot be feasibly avoided, the project applicant will consult with CDFW and obtain appropriate take authorization from the CDFW through the CESA Incidental Take Permit process. In the event an Incidental Take Permit is needed, mitigation for direct impacts to burrowing owl shall be fulfilled through compensatory mitigation at a minimum 1:1 habitat replacement of equal or better functions and values to those impacted by the Project, through the purchase of credits at a CDFW approved mitigation bank or other conservation mechanism approved by CDFW, or as otherwise determined through the Incidental Take Permit process as further detailed in **MM-BIO-5**. In addition, implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources), which would require biological monitoring and WEAP training would reduce potential direct impacts to burrowing owl individuals to less than significant. Therefore, direct impacts to burrowing owl would be **less than significant with mitigation incorporated**.

Desert Kit Fox

No desert kit fox individuals were observed during the desert tortoise or burrowing owl surveys, or incidentally observed during other focused surveys conducted within the BSA. However, desert kit fox tracks and suitable burrows were observed within the BSA during surveys. Therefore, this species has moderate potential to occupy the BSA prior to construction. Potential direct impacts to kit fox individuals would be significant absent mitigation.

To avoid potential direct impacts to desert kit fox, a pre-construction survey for desert kit fox would be conducted within 10 days prior to the start of construction to determine the presence/absence of this species pursuant to **MM-BIO-6** (Pre-Construction Survey for Desert Kit Fox and Avoidance). If the pre-construction survey determines desert kit fox are present, a desert kit fox relocation and mitigation plan would need to be prepared consistent with the standards identified in **MM-BIO-6** to ensure that potential impacts to this species are less than significant. Direct impacts to desert kit fox would also be avoided through implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources), which would require biological monitoring and WEAP training. With the incorporation of mitigation, impacts associated with desert kit fox would be **less than significant with mitigation incorporated**.

Loggerhead Shrike

Loggerhead shrike was incidentally observed within the BSA during surveys. The BSA contains open habitats with scattered shrubs and trees suitable for nesting and foraging (CDFW 2024d). Due to the amount of suitable nesting and foraging habitat occurring within the surrounding region (i.e., according to Penrod et al. 2008, more than 200,000 acres of desert scrub habitat within the Joshua Tree-Twentynine Palms linkage is protected), direct impacts to 143.9 acres of suitable nesting and foraging habitat for loggerhead shrike would be less than significant. Direct impacts to loggerhead shrike individuals from construction are generally unlikely due to its high mobility and access to adjacent habitat. However, potential significant direct impacts may occur to nesting loggerhead shrike during vegetation removal. Therefore, in accordance with the federal MBTA (16 USC 703–711), implementation of **MM-BIO-7** (Pre-Construction Nesting Bird Survey) would minimize potential direct impacts to a less-than-significant level through performance of a nesting bird survey if vegetation is removed during the general nesting season (January 1 through July 31), and avoidance buffers and monitoring if active nests are found. Therefore, direct impacts to nesting loggerhead shrike would be **less than significant with mitigation incorporated**.

Vermilion Flycatcher

Vermilion flycatcher was incidentally observed foraging within the BSA during surveys. The BSA contains desert riparian woodlands potentially used for nesting and other suitable habitats used for foraging by this species. Due to the amount of suitable foraging habitat occurring within the surrounding region (i.e., according to Penrod et al. 2008 more than 200,000 acres of desert scrub habitat within the Joshua Tree-Twentynine Palms linkage is protected), direct impacts to 143.9 acres of suitable foraging habitat for vermilion flycatcher would be less than significant. This species is not known to nest within the project site vicinity and all potential nesting habitat (i.e., desert-willow–smoketree wash woodland) would be avoided at the Project-Level. Furthermore, direct impacts to vermilion flycatcher individuals from construction are generally unlikely due to its high mobility and access to adjacent habitat. Therefore, no direct impacts are anticipated to occur to vermilion flycatchers from project implementation. However, in accordance with the federal MBTA (16 USC 703–711), implementation of **MM-BIO-7** (Pre-Construction Nesting Bird Survey) would provide additional protection through performance of a nesting bird survey if vegetation is removed during the general nesting season (January 1 through July 31), and avoidance buffers and monitoring if active nests are found. Therefore, direct impacts to nesting vermilion flycatcher would be **less than significant with mitigation incorporated**.

Migratory and Nesting Birds

The BSA contains suitable habitat for migratory and native nesting birds. Migratory and native nesting bird species are protected by California Fish and Game Code Sections 3503 and 3503.5 and by the federal MBTA (16 USC 703–711). In particular, Section 3503 provides that it is unlawful to take, possess, or needlessly destroy the active nests or eggs of any bird in California; Section 3503.5 protects all raptors and their eggs and active nests; and the MBTA prohibits the take (including killing, capturing, selling, trading, and transport) of native migratory bird species throughout the United States. Currently, California considers any nest that is under construction or modification or is supporting eggs, nestlings, or juveniles as "active." Therefore, impacts to nesting migratory birds and raptors would be considered significant absent mitigation under CEQA.

Project implementation of **MM-BIO-7** (Pre-Construction Nesting Bird Survey) would reduce potential direct impacts to a less-than-significant level through a requirement for a pre-construction nesting bird survey by a qualified biologist conducted prior to vegetation removal if vegetation is removed during the nesting bird season, and avoidance buffers and monitoring if active nests are found. Therefore, direct impacts to nesting birds would be **less than significant with mitigation incorporated.**

Lake Effect on Migratory Birds

Additionally, potential long-term indirect impacts that could result from operations and maintenance of the solar facility to migratory birds would be a result of a potential "lake effect." The lake effect hypothesis (LEH) is an attraction where PV panels are thought to reflect ultraviolet light rays, which confuse birds into misidentifying the solar facility as a body of water (Kagan et al. 2014). The birds then either collide with the solar facility and are injured or killed or are stranded because they require water to take flight (e.g., ducks).

For the most part, CEQA evaluation of the effects of "lake effect" on avian species would be in regard to the following CEQA Checklist items:

- Section IV(a) (Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?)
- IV(d) (Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?)

Within North America, there are four major migratory flyways or routes, the Atlantic, Mississippi, and Pacific (Pacific Flyway Council 2024; Pacific Birds 2024). The Pacific Flyway is a major north-south route for migratory birds in the Americas, stretching from Alaska to Patagonia and includes portions of Alaska, Arizona, California, Idaho, Nevada, Oregon, Utah, Washington, and those portions of Colorado, Montana, New Mexico, and Wyoming west of the Continental Divide within the United States. This flyway is essential for millions of birds that travel between their breeding and wintering grounds each year. The peak use periods for the Pacific Flyway are during the spring and fall migrations. In the spring, birds travel north to their breeding grounds, while in the fall, they head south to their wintering areas. These migrations are timed to coincide with the availability of food and suitable breeding or wintering habitats.

The Pacific Flyway, particularly in California, encompasses several key paths and focused routes. Many birds follow the coastline, taking advantage of the rich feeding grounds provided by estuaries, wetlands, and coastal habitats. This route is particularly important for shorebirds and waterfowl. Some species travel through the interior, using river valleys and mountain ranges as navigational aids. The Central Valley of California and Salton Sea areas are important stopover locations for many species, particularly water birds and raptors.

The Pacific Flyway supports a diverse array of bird species, including waterfowl like the northern pintail (*Anas acuta*), mallard (*A. platyrhynchos*), and snow goose (*Anser caerulescens*); shorebirds such as the western sandpiper (*Calidris mauri*), dunlin (*C. alpina*), and long-billed dowitcher (*Limnodromus scolopaceus*); raptors including the bald eagle (*Haliaeetus leucocephalus*) and American peregrine falcon (*Falco peregrinus anatum*); and many passerines like the yellow warbler (*Setophaga petechia*) and Swainson's thrush (*Catharus ustulatus*). Conservation efforts along the Pacific Flyway focus on protecting critical habitats, such as wetlands, estuaries, and stopover sites that provide essential resources for migrating birds.

Along this interior route, most birds fly along the west coast of mainland Mexico, and up through the southern estuaries of the Colorado River where they meet the Gulf of California., then up through Imperial County to and through the Salton Sea area, and north along both sides of the mountain ranges (Peninsular, San Bernardino), over the Transverse Ranges and into the Central Valley. The BSA's setting in the Pacific flyway and its proximity to the Salton Sea, a Birdlife International endangered priority site (ID296; Birdlife International 2014), suggest that migratory birds could use the site. The Salton Sea is located approximately 44 miles to the south of the BSA and is considered an extremely important migratory stop-over site where millions of birds, including waterbirds and shorebirds, rest and forage along the Pacific flyway (Audubon 2023; Patten et al. 2003). Additionally, the BSA is in the Mojave Desert. eBird (2023) and CDFW's Areas of Conservation Emphasis (ACE) (CDFW 2017) are two online public data sources that provide information on bird species occurring in the region. The eBird hotspot "Joshua Tree NP—Indian Cove area," approximately 5 miles southwest of the BSA, represents one of the closest hotspots with similar habitat to that on site and contains records of resident and migratory species. Also, Joshua Tree National

Park, located approximately 5 miles south of the BSA, has extensive data on bird occurrences and provides another assemblage of species that may occur on or near the site. Over 250 bird species have been recorded within the park boundary, most of which are migrants and vagrants due to the park's location on the inland portion of the Pacific flyway (NPS 2023).

Biological surveys were conducted within the BSA in April, August, November, December 2023, and March, April, May, June, and July 2024. Bird species observed within the BSA were documented during each of the main bird use seasons (breeding, migration non-breeding/winter) and provide baseline data and a representative sample of species occurring throughout the year. Seventeen bird species were detected on or within the vicinity of the BSA and include California species of special concern loggerhead shrike (*Lanius ludovicianus*) and vermilion flycatcher (*Pyrocephalus rubinus*). The remaining fifteen birds species observed include American kestrel (*Falco sparverius*), house finch, lesser nighthawk (*Chordeiles acutipennis*), common raven, northern mockingbird (*Mimus polyglottos*), Gambel's quail, turkey vulture (*Cathartes aura*), blue-gray gnatcatcher, mourning dove, greater roadrunner (*Geococcyx californianus*), cactus wren (*Campylorhynchus brunneicapillus*), black-throated sparrow, Bell's sparrow, Brewer's sparrow (*Spizella breweri*), and white-crowned sparrow (Appendix E). No aquatic birds were detected on or within the vicinity of the BSA nor were any observed flying over the BSA during the 2023 and 2024 survey efforts.

Research to date has documented that solar energy facilities can potentially cause bird mortality from exposure or impact trauma by creating a lake effect, which attracts local or migrating birds at abundances greater than the surrounding landscape, exposing them to hazards such as stranding or collisions with facility infrastructure (Kagan et al. 2014; Smith and Dwyer 2016). The lake effect hypothesis (LEH) is a method of attraction where photovoltaic panels are thought to reflect ultraviolet light rays, which confuse birds into misidentifying the solar facility as a body of water (Kagan et al. 2014; CEC 2024). The birds then either collide with the solar facility and are injured or killed or are stranded because they require water for running to take flight (e.g., ducks, grebes). According to a California Energy Commission (CEC) study, aquatic habitat birds were more common at solar facilities located in an irrigated agricultural landscape than in desert or grassland habitats (CEC 2024). The nearest agricultural lands to the BSA are located within the Coachella Valley approximately 33 miles south, and agricultural lands surrounding the Colorado River near Blythe, approximately 90 miles east of the BSA. Further, the BSA is not located between or near water bird attractants such as water bodies or irrigated fields. Aquatic bird detections were not made in the desert/scrub and grassland reference areas during the CEC study, and no evidence was found of aquatic birds attempting to land nor were flocks observed circling facilities (CEC 2024). The major water body in the vicinity of the CEC study sites in the desert/scrub and agricultural habitat was the Salton Sea, similar to the BSA. Furthermore, data from the CEC study suggest that mortality at PV facilities was low compared with the regional abundance and diversity of birds (CEC 2024).

Research on this topic is ongoing, but recent studies suggest that solar facilities are unlikely to imitate a lake at all times to all aquatic birds (i.e., lake effect is a rather nuanced process) (Kosciuch et al. 2021; CEC 2024). The findings of the CEC study indicate that certain species of aquatic birds may be drawn to PV solar facilities; however, the extent of this attraction remains unclear across the various species (CEC 2024). Furthermore, although some findings from the CEC study are consistent with the main predications and assumptions of the LEH, it concludes that it is unknown if the LEH is correct and recommends further study on the issue (CEC 2024).

Given the above discussion, there is no evidence that the project would result in a reasonably foreseeable effect to migratory birds (Section IV(d), specifically LEH). Information needed to fully and comprehensively identify the specific effects on migratory birds and the LEH is incomplete. Additionally, there are no known special status avian species (Section IV(a), particularly water birds such as rails, in the area that would be expected to be affected by

LEH. Therefore, direct and indirect impacts to migratory birds and special status species would be **less than significant**.

Future Road Dedication Impacts

Within BSA

Mojave Desert Tortoise

No Mojave Desert tortoise individuals or sign were observed during the 2023 focused surveys conducted within the Future Road Dedication areas; however, individuals, sign, and suitable burrows were incidentally observed immediately outside and adjacent to these areas during the burrowing owl protocol-level surveys conducted for the project (Figures 11A and 11B). A total of 8.8 acres of suitable desert scrub habitat would be permanently impacted by the Future Road Dedications, including 2.7 acres along the Amboy Road dedication, 3.6 acres along the Noels Knoll Road dedication, and 2.5 acres along the Samarkand Drive dedication. Impact totals do not include impacts to disturbed habitat and urban/developed land cover types.

Direct impacts to Mojave Desert tortoise from the Future Road Dedication areas would be the same as Project-Level impacts. Direct impacts to Mojave Desert tortoise would be minimized to **less than significant with mitigation incorporated,** including implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources), which would require biological monitoring and WEAP training, **MM-BIO-3** (Desert Tortoise Avoidance and Minimization Measures), which would require temporary desert tortoise exclusion fencing, and **MM-BIO-4** (Desert Tortoise Habitat Compensatory Mitigation), which would require occupied desert tortoise habitat be mitigated at a 1:1 ratio.

Burrowing Owl

One suitable burrow contained sign (i.e., pellet) adjacent to Amboy Road within the northwestern portion of the BSA (Figure 12). Direct impacts to burrowing owl from the Future Road Dedication areas would be the same as Project-Level impacts. Direct impacts to burrowing owl would be minimized to **less than significant with mitigation incorporated,** including implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources), which would require biological monitoring and WEAP training, and **MM-BIO-5** (Pre-Construction Burrowing Owl Surveys and Avoidance), which requires a pre-construction survey for burrowing owl and compensatory mitigation for permanent loss of burrowing owl habitat if individuals are observed.

Desert Kit Fox

Direct impacts to desert kit fox from the Future Road Dedication areas would be the same as Project-Level impacts. Direct impacts to desert kit fox would be minimized to **less than significant with mitigation incorporated,** including implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources), which would require biological monitoring and WEAP training, and **MM-BIO-6** (Pre-Construction Survey for Desert Kit Fox and Avoidance), which requires a pre-construction survey and relocation and mitigation plan if individuals are observed.

Loggerhead Shrike

Direct impacts to loggerhead shrike from the Future Road Dedication areas would be the same as Project-Level impacts. Direct impacts to loggerhead shrike would be minimized to **less than significant with mitigation incorporated,** including implementation of **MM-BIO-7** (Pre-Construction Nesting Bird Survey), which requires a nesting bird survey if vegetation is removed during the general nesting season (January 1 through July 31), and avoidance buffers and monitoring if active nests are found.

Vermilion Flycatcher

A total of 0.7 acres of suitable nesting habitat (Desert Willow–Smoketree Wash Woodland) would be permanently impacted by the Future Road Dedications, including 0.3 acres along the Amboy Road dedication and 0.4 acres along the Noels Knoll Road dedication within the BSA. Direct impacts to vermilion flycatcher would be minimized to **less than significant with mitigation incorporated,** including implementation of **MM-BIO-7** (Pre-Construction Nesting Bird Survey), which requires a nesting bird survey if vegetation is removed during the general nesting season (January 1 through July 31), and avoidance buffers and monitoring if active nests are found.

Migratory and Nesting Birds

Direct impacts to migratory and nesting birds from the Future Road Dedication areas would be the same as Project-Level impacts. Direct impacts to migratory and nesting birds would be minimized to **less than significant with mitigation incorporated,** including implementation of **MM-BIO-7** (Pre-Construction Nesting Bird Survey), which requires a nesting bird survey if vegetation is removed during the general nesting season (January 1 through July 31), and avoidance buffers and monitoring if active nests are found.

Outside BSA

Surveys were not conducted outside the BSA for Samarkand Drive; therefore, there is a potential for burrowing owl, Mojave desert tortoise, desert kit fox, loggerhead shrike, vermilion flycatcher, and migratory birds to occur outside the BSA. Project implementation of **MM-BIO-1** (Future Road Dedication Focused Surveys, Avoidance, and Mitigation Outside the BSA) would reduce potential direct impacts to a less-than-significant level through focused special-status wildlife surveys, avoidance and minimization measures, and/or compensatory mitigation to comply with CEQA. Therefore, direct impacts to special-status wildlife species and migratory birds would be **less than significant with mitigation incorporated**.

6.3.1.2.2 Indirect Impacts

Project-Level Impacts

Mojave Desert Tortoise

Construction-Related

Potential short-term or temporary indirect impacts to desert tortoises resulting from construction activities include adverse effects from the generation of fugitive dust, noise and vibration, and increased human presence, including generation of trash that may attract desert tortoise predators (e.g., ravens, domestic dogs). Potential short-term or temporary indirect impacts to desert tortoise are considered significant absent mitigation.

Project implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) would reduce potential indirect impacts during construction to a less-than-significant level by requiring implementation of biological monitoring and a WEAP Training that will cover the special-status resources and mitigation requirements for the project; delineation of project boundaries; and implementation of standard dust control measures. Additionally, implementation of **MM-BIO-3** (Desert Tortoise Avoidance and Minimization Measures) would require installation of exclusion fencing prior to the initiation of vegetation clearing, removal of tortoises from the area by the authorized biologist if the appropriate state and federal permits have been obtained or be allowed to move off site on their own by creating a gap in the fence, desert tortoise clearance surveys, trash removal, biological monitors with stop work authority, and speed limit restrictions. Security fencing shall be placed inside of the desert tortoise exclusion fencing, which shall remain in place for the duration of project operations (e.g., excluding all wildlife from entering the project), as recommended by USFWS and CDFW (Lalumiere, pers. comm. 2025). With implementation of **MM-BIO-2** and **MM-BIO-3** (Desert Tortoise Avoidance and Minimization Measures), the effect of construction-related indirect impacts to desert tortoise would be minimized to **less than significant with mitigation incorporated.**

Long-Term

Potential long-term indirect impacts that could result from operations and maintenance of the solar facility near desert tortoise individuals or their suitable habitat located outside the project site would be chemical releases such as oils and grease from vehicles that could degrade habitat; increased invasive plant species that may degrade habitat; and trampling of vegetation and soil compaction by humans, which could affect soil moisture, water penetration, surface flows, and erosion. These potential long-term indirect impacts to desert tortoise would be potentially significant absent mitigation.

The solar facility will be operated on an unstaffed basis and monitored remotely, with on-site personnel visitations for security, maintenance, and system monitoring on an as-needed and likely in-frequent basis. However, project implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) would reduce potential long-term indirect impacts to a less-than-significant level by requiring measures to ensure runoff is not altered from existing conditions and toxicants are not discharged; incorporation of perimeter fencing to prevent access during construction; and application of a native seed mix to promote passive restoration of temporary impact areas that does not include species from the California Invasive Plant Council (Cal-IPC) California Invasive Plant Inventory; and prevent operations and maintenance staff access to areas outside of the project that may result in trampling of vegetation and soil compaction that could degrade habitat. With implementation of **MM-BIO-2**, the effect of long-term indirect impacts to desert tortoise would be minimized to **less than significant with mitigation incorporated.**

Burrowing Owl

Construction-Related

Potential short-term or temporary indirect impacts to burrowing owl resulting from construction activities include the release of chemical pollutants; generation of fugitive dust; adverse effects from noise and vibration and increased human presence. These potential construction-related indirect impacts to burrowing owl would be potentially significant absent mitigation.

Project implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) would reduce potential indirect impacts during construction to a less-than-significant level by requiring

implementation of biological monitoring and a WEAP Training that will cover the special-status resources and mitigation requirements for the project; delineation of project boundaries; ensuring that construction will not be conducted at night; ensuring toxicants are not discharged; and implementation of standard dust control measures. With implementation of **MM-BIO-2**, the effect of construction-related indirect impacts to burrowing owl would be minimized to **less than significant with mitigation incorporated.**

Long-Term

Potential long-term indirect impacts that could result from operations and maintenance of the solar facility near burrowing owl individuals or their suitable habitat would be chemical releases such as oils and grease from vehicles that could degrade habitat; increased invasive plant species that may degrade habitat; and trampling of vegetation and soil compaction by humans, which could affect soil moisture, water penetration, surface flows, and erosion. These potential long-term indirect impacts to burrowing owl would be potentially significant absent mitigation.

The solar facility will be operated on an unstaffed basis and monitored remotely, with on-site personnel visitations for security, maintenance, and system monitoring on an as-needed and likely in-frequent basis. However, project implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) would reduce potential long-term indirect impacts to a less-than-significant level by requiring measures to ensure runoff is not altered from existing conditions and toxicants are not discharged; incorporation of perimeter fencing to prevent access to areas with potential habitat for burrowing owl; and application of a native seed mix to promote passive restoration of temporary impact areas that does not include species from the California Invasive Plant Council (Cal-IPC) California Invasive Plant Inventory; and prevent operations and maintenance staff access to areas outside of the project that may results in trampling of vegetation and soil compaction that could degrade habitat. With implementation of **MM-BIO-2**, the effect of long-term indirect impacts to burrowing owl would be minimized to **less than significant with mitigation incorporated.**

Migratory and Nesting Birds, Loggerhead Shrike, Vermilion Flycatcher

Construction-Related

Potential short-term or temporary indirect impacts to migratory and nesting birds, loggerhead shrike, and vermilion flycatcher resulting from construction activities include the release of chemical pollutants; generation of fugitive dust; adverse effects from noise and, vibration, and increased human presence. These potential construction-related indirect impacts to migratory and nesting birds, loggerhead shrike, and vermilion flycatcher would be potentially significant absent mitigation.

Project implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) would reduce potential indirect impacts during construction to a less-than-significant level by requiring implementation of biological monitoring and a WEAP Training that will cover the special-status resources and mitigation requirements for the project; delineation of project boundaries; ensuring that construction will not be conducted at night; ensuring toxicants are not discharged; and implementation of standard dust control measures. Project implementation of **MM-BIO-7** (Pre-Construction Nesting Bird Survey) would reduce potential indirect impacts to a less-than-significant level through a pre-construction nesting bird survey by a qualified biologist would be required prior to vegetation removal during nesting season. If an active bird nest is found, the nest shall be flagged and mapped on the construction grading plans, along with an appropriate buffer established around the nest, which shall be determined by the biologist based on the species' sensitivity to disturbance (typically 300 feet for passerines and 500 feet for raptors and special-status species). The nest area shall be avoided until the nest is

vacated and the juveniles have fledged. The nest area shall be demarcated in the field with flagging and stakes or construction fencing. On-site construction monitoring shall be conducted when construction occurs in close proximately to an active nest buffer. No project activities shall encroach into established buffers without the consent of a monitoring biologist. The buffer shall remain in place until it is determined that the nestlings have fledged and the nest is no longer active. With implementation of **MM-BIO-2** and **MM-BIO-7**, the effect of construction-related indirect impacts to nesting birds, loggerhead shrike, and vermilion flycatcher would be minimized to **less than significant with mitigation incorporated.**

Long-Term

Potential long-term indirect impacts that could result from operations and maintenance of the solar facility near nesting birds or their suitable habitat would be chemical releases such as oils and grease from vehicles that could degrade habitat; increased invasive plant species that may degrade habitat; and trampling of vegetation and soil compaction by humans, which could affect soil moisture, water penetration, surface flows, and erosion. These potential long-term indirect impacts to nesting birds, loggerhead shrike, vermilion flycatcher would be potentially significant absent mitigation.

The solar facility will be operated on an unstaffed basis and monitored remotely, with on-site personnel visitations for security, maintenance, and system monitoring on an as-needed and likely in-frequent basis. However, project implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) would reduce potential long-term indirect impacts to a less-than-significant level by requiring measures to ensure runoff is not altered from existing conditions and toxicants are not discharged; stipulations that night-lighting will not be directed towards open space areas; and application of a native seed mix to promote passive restoration of temporary impact areas that does not include species from the California Invasive Plant Council (Cal-IPC) California Invasive Plant Inventory; and prevent operations and maintenance staff access to areas outside of the project that may results in trampling of vegetation and soil compaction that could degrade habitat. With implementation of **MM-BIO-2**, the effect of long-term indirect impacts to burrowing owl would be minimized to **less than significant with mitigation incorporated.**

Future Road Dedication Impacts

Within BSA

Construction-related and long-term indirect impacts to desert tortoise, burrowing owl, loggerhead shrike, vermilion flycatcher, and migratory birds from the Future Road Dedication areas would be the same as Project-Level impacts. Indirect impacts would be minimized to **less than significant with mitigation incorporated,** including implementation of **MM-BIO-1** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources Outside the BSA), which would require biological monitoring and a WEAP Training, delineation of project boundaries, implementation of noise measures, and implementation of standard dust control measures; **MM-BIO-3** (Desert Tortoise Avoidance and Minimization Measures) would require trash removal, biological monitors with stop work authority, and speed limit restrictions; and **MM-BIO-7** (Pre-Construction Nesting Bird Survey), which would require avoidance buffers and monitoring if active nests are found during the pre-construction nesting bird survey.

Outside BSA

Surveys were not conducted outside the BSA for Samarkand Drive. Future development outside the BSA has the potential to result in indirect impacts to special-status wildlife, including desert tortoise, burrowing owl, desert kit

fox, loggerhead shrike and vermilion flycatcher, as well as migratory and nesting birds. Indirect impacts to special-status wildlife and migratory birds outside the BSA would be the same as Project-Level impacts. With implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources), the effect of construction-related and long-term indirect impacts to special-status wildlife and migratory birds outside the BSA would be minimized to **less than significant with mitigation incorporated**.

6.3.2 Impact BIO-2: Sensitive Vegetation Communities

As stated in Section 5.1, Vegetation Communities and Land Covers, CDFW state rankings of 1, 2, or 3 are considered high priority for inventory or special-status and impacts to these communities typically require mitigation. Within the BSA, the following vegetation community is considered a sensitive biological resource by CDFW under CEQA: desert willow–smoketree wash woodland.

6.3.2.1 Direct Impacts

Project-Level Impacts

The proposed project will not result in direct impacts to desert willow–smoketree wash woodland (Table 5B); therefore, **no direct impacts** to special-status vegetation communities are anticipated and no avoidance or compensatory mitigation measures are required.

Future Road Dedication Impacts

Within BSA

The Future Road Dedications will potentially impact 0.7 acres of desert willow–smoketree wash woodland, as summarized in Table 6.

Table 6. Future Road Dedication Permanent Impacts Within the BSA to Sensitive Vegetation Communities (Acres)

Vegetation Community	Alliance	Association	Ranking	Amboy Road	Noels Knoll Road	Samarkand Drive
Riparian						
Desert Willow–Smoketree Wash Woodland[1]	*Chilopsis linearis–Psorothamnus spinosus*	*Psorothamnus spinosus*	S3	0.3	0.4	0
			Total[2]	**0.3**	**0.4**	**0**

Notes:
1 Community is sensitive under CEQA and listed by California Department of Fish and Wildlife as sensitive (i.e., State Rank [S] 1, 2, or 3) (CDFW 2024c).
2 Totals may not sum due to rounding.

If avoidance of the desert willow–smoketree wash woodland is not feasible, then mitigation for direct permanent impacts from the Future Road Dedications to this sensitive vegetation community would occur at a minimum of a 1:1 mitigation ratio through either on-site and/or off-site mitigation or through purchase of credits at a CDFW-approved mitigation bank as required in **MM-BIO-8** (Sensitive Vegetation Communities and Jurisdictional

Resources Mitigation). Therefore, impacts to sensitive vegetation communities from the Future Road Dedications would be **less than significant with mitigation incorporated**.

Outside BSA

Surveys were not conducted outside the BSA for Samarkand Drive. Dudek conducted vegetation mapping through a combination of a desktop analysis and using aerial signatures from the BSA. Based on desktop mapping, the Future Road Dedications outside the BSA will not result in direct impacts to desert willow–smoketree wash woodland (Table 5B); however, this vegetation mapping shall be confirmed prior to issuance of any grading permit associated with the extension of Samarkand Drive. Therefore, vegetation mapping shall be conducted prior to issuance of any grading permit associated with the extension of Samarkand Drive in accordance with the methods presented in Section 3.2.1, Vegetation Community and Land Cover Mapping, of this report to determine the presence or absence of sensitive vegetation communities. Future development outside the BSA has the potential to result in impacts to sensitive vegetation communities if present. Direct impacts to sensitive vegetation communities outside the BSA, if present, would be the same as Project-Level impacts. With implementation of **MM-BIO-1** (Future Road Dedication Focused Surveys, Avoidance, and Mitigation Outside the BSA) and **MM-BIO-8** (Sensitive Vegetation Communities and Jurisdictional Resources Mitigation), direct impacts to sensitive vegetation communities if present outside the BSA would be minimized to **less than significant with mitigation incorporated**.

6.3.2.2 Indirect Impacts

Project-Level Impacts

Construction-Related

Potential short-term or temporary indirect impacts to sensitive vegetation communities (i.e., desert willow-smoketree wash woodland) resulting from construction activities include inadvertent spillover impacts, including unintentional clearing, trampling, or grading outside the project footprint; generation of fugitive dust; changes in hydrology resulting from construction, including sedimentation and erosion; and the release of chemical pollutants. These potential construction-related indirect impacts to sensitive vegetation communities would be potentially significant absent mitigation.

Project implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) would reduce potential indirect impacts during construction to a less-than-significant level by requiring implementation of biological monitoring and a WEAP Training that will cover the special-status resources and mitigation requirements for the project; delineation of project boundaries; implementation of standard dust control measures; completion and approval of a stormwater pollution prevention plan (SWPPP); and toxicants are not discharged. With implementation of **MM-BIO-2**, the effect of construction-related indirect impacts to sensitive vegetation communities would be minimized to **less than significant with mitigation incorporated.**

Long-Term

Potential long-term indirect impacts that could result from operations and maintenance of the solar facility near sensitive vegetation communities would be chemical releases such as oils and grease from vehicles that could degrade habitat; increased invasive plant species that may degrade habitat; and trampling of vegetation and soil compaction by humans, which could affect soil moisture, water penetration, surface flows, and erosion. These

potential long-term indirect impacts to sensitive vegetation communities would be potentially significant absent mitigation.

The solar facility will be operated on an unstaffed basis and monitored remotely, with on-site personnel visitations for security, maintenance, and system monitoring on an as-needed and likely in-frequent basis. However, project implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) would reduce potential long-term indirect impacts to a less-than-significant level by requiring operation and maintenance personnel to watch a WEAP Training recording, and requiring measures to ensure runoff is not altered from existing conditions and toxicants are not discharged; application of a native seed mix to promote passive restoration of temporary impact areas that does not include species from the California Invasive Plant Council (Cal-IPC) California Invasive Plant Inventory; and incorporation of perimeter fencing to prevent access to areas occupied by sensitive vegetation communities. With implementation of **MM-BIO-2**, the effect of long-term indirect impacts to sensitive vegetation communities would be minimized to **less than significant with mitigation incorporated.**

Future Road Dedication Impacts

Within BSA

Indirect impacts to sensitive vegetation communities from the Future Road Dedication areas would be the same as Project-Level impacts. With implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources), the effect of construction-related and long-term indirect impacts to vegetation communities would be minimized to **less than significant with mitigation incorporated.**

Outside BSA

Field surveys were not conducted outside the BSA for Samarkand Drive. Future development outside the BSA has the potential to result in indirect impacts to sensitive vegetation communities. Indirect impacts to sensitive vegetation communities outside the BSA would be the same as Project-Level impacts. With implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources), the effect of construction-related and long-term indirect impacts to sensitive vegetation communities outside the BSA would be minimized to **less than significant with mitigation incorporated.**

6.3.3 Impact BIO-3: State or Federally Protected Waters

The results of the jurisdictional delineation concluded there are approximately 7.39 acres of non-wetland waters of the state under the jurisdiction of the RWQCB and streambed or riparian habitat under CDFW jurisdiction within the BSA (Figure 8). A jurisdictional delineation was not conducted for Future Road Dedication areas outside the BSA (Samarkand Drive).

6.3.3.1 Direct Impacts

Project-Level Impacts

There are no state- or federally protected wetlands within the Project-Level impact area; therefore, **no direct impacts** to wetlands are anticipated and no avoidance or compensatory mitigation measures are required.

The Project-Level area has been designed to completely avoid all impacts to jurisdictional non-wetland waters through construction of one bridge within the central portion of the site and one off-site bridge along the gen-tie access road. The bridge abutments would occur outside the mapped non-wetland waters, allowing for flows conveyed within the features to continue to provide pre-project function and value for the site. Additionally, the solar arrays have been setback at of minimum of approximately 25 feet away the non-wetland waters to ensure impacts to these features are avoided. Therefore, **no direct impacts** to non-wetland waters of the state under the jurisdiction of the RWQCB and streambed under CDFW are anticipated and therefore no compensatory mitigation measures are required (Figure 13, Impacts to Jurisdictional Aquatic Resources).

Future Road Dedication Impacts

Within BSA

If avoidance of jurisdictional aquatic resources is not feasible within the Future Road Dedication impact areas, then a total of 0.63 acres of non-wetland waters under RWQCB jurisdiction and streambeds or riparian habitat under CDFW jurisdiction would be impacted by the Future Road Dedication areas (Figure 13). Table 7 summarizes the impacts by jurisdictional resource for each of the dedication areas.

Table 7. Future Road Dedication Permanent Impacts to Aquatic Resources Within BSA

RWQCB/CDFW Jurisdictional Resource	Future Road Dedications Permanent Impacts (Acres)			Total (Acres)
	Amboy Road	Noels Knoll Road	Samarkand Drive	
Non-Wetland Water/Streambed	0.06	0.13	0.04	0.24
Non-Wetland Water/Riparian Habitat	0.11	0.28	0	0.40
Total	**0.17**	**0.42**	**0.04**	**0.63**

Notes: RWQCB = Regional Water Quality Control Board; CDFW = California Department of Fish and Wildlife.

Permits would be required from each of the aquatic resource regulatory agencies (i.e., RWQCB and CDFW) and mitigation to offset the impacts and loss of beneficial uses, functions, and values to the jurisdictional waters. **MM-BIO-8** (Sensitive Vegetation Communities and Jurisdictional Resources Mitigation) would require obtaining permits from each of the regulatory agencies (RWQCB and CDFW). A Waste Discharge Requirement from the RWQCB would be required if waters of the state are impacted, as there is no federal action (such as a 404 permit) for the project at the time of this report. A notification of a Streambed Alteration Agreement to CDFW also would be required prior to modification of jurisdictional streambeds. Applications for any of these permits would require demonstration of avoidance and minimization of aquatic resources to the maximum extent practicable, and compensatory mitigation would be required for permanent loss of waters or functions and values of waters. **MM-BIO-8** will mitigate for direct, permanent impacts to waters of the state through either an approved mitigation bank or through a combination of on-site and/or off-site mitigation.

In addition, **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) would require that all workers complete WEAP training, would require biological monitoring and compliance with all biological resource mitigation requirements, and require that impacts occur within the fenced, staked, or flagged area that is clearly delineated within the project impact footprint. The construction crew would be responsible for unauthorized impacts from construction activities to waters of the state that are outside the permitted project

footprint, if applicable. Therefore, impacts to jurisdictional aquatic resources from the Future Road Dedications would be **less than significant with mitigation incorporated**.

Outside BSA

An aquatic resources delineation was not conducted for the portion of Samarkand Drive located outside the BSA. Therefore, an aquatic resources delineation shall be conducted prior to issuance of any grading permit associated with the extension of Samarkand Drive in accordance with the methods presented in Section 3.2.4.6, Aquatic Resources Delineation, of this report to determine the presence or absence jurisdictional aquatic resources. If present, and if avoidance is not feasible, direct impacts to jurisdictional aquatic resources from the Future Road Dedication areas would be the same as Future Road Dedications within the BSA impacts. Direct impacts to jurisdictional aquatic resources, if present, would be minimized to **less than significant with mitigation incorporated,** including implementation of **MM-BIO-1** (Future Road Dedication Focused Surveys, Avoidance, and Mitigation Outside the BSA), **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources), and **MM-BIO-8** (Sensitive Vegetation Communities and Jurisdictional Resources Mitigation).

6.3.3.2 Indirect Impacts

Project-Level Impacts

Construction-Related

Potential short-term or temporary indirect impacts to jurisdictional aquatic resources resulting from construction activities include inadvertent spillover impacts, including unintentional clearing, trampling, or grading outside the project footprint; generation of fugitive dust; changes in hydrology resulting from construction, including sedimentation and erosion; and the release of chemical pollutants. These potential construction-related indirect impacts to jurisdictional aquatic resources would be potentially significant absent mitigation.

Project implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) would reduce potential indirect impacts during construction to a less-than-significant level by requiring implementation of biological monitoring and a WEAP Training that will cover the special-status resources and mitigation requirements for the project; delineation of project boundaries; implementation of standard dust control measures; completion and approval of a stormwater pollution prevention plan (SWPPP); and toxicants are not discharged.

Implementation of **MM-BIO-9** (Avoidance and Minimization of Impacts to Potential Jurisdictional Aquatic Resources) would require avoidance and minimization measures when ground-disturbing activities occur within 25 feet of waters of the state and/or jurisdictional streambeds. With implementation of **MM-BIO-2** and **MM-BIO-9**, impacts to jurisdictional aquatic resources would be minimized to **less than significant with mitigation incorporated.**

Long-Term

Potential long-term indirect impacts that could result from operations and maintenance of the solar facility near jurisdictional aquatic resources would be chemical releases such as oils and grease from vehicles that could degrade habitat; increased invasive plant species that may degrade habitat; and trampling of vegetation and soil compaction by humans, which could affect soil moisture, water penetration, surface flows, and

erosion. These potential long-term indirect impacts to jurisdictional aquatic resources would be potentially significant absent mitigation.

The solar facility will be operated on an unstaffed basis and monitored remotely, with on-site personnel visitations for security, maintenance, and system monitoring on an as-needed and likely in-frequent basis. However, project implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) would reduce potential long-term indirect impacts to a less-than-significant level by requiring operation and maintenance personnel to watch a WEAP Training recording, and requiring measures to ensure runoff is not altered from existing conditions and toxicants are not discharged; application of a native seed mix to promote passive restoration of temporary impact areas that does not include species from the California Invasive Plant Council (Cal-IPC) California Invasive Plant Inventory; and incorporation of perimeter fencing to prevent access to areas occupied by jurisdictional aquatic resources. With implementation of **MM-BIO-2**, the effect of long-term indirect impacts to jurisdictional aquatic resources would be minimized to **less than significant with mitigation incorporated.**

Future Road Dedication Impacts

Within BSA

Indirect impacts to jurisdictional aquatic resources from the Future Road Dedication areas would be the same as Project-Level impacts. With implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) and **MM-BIO-9** (Avoidance and Minimization of Impacts to Potential Jurisdictional Aquatic Resources), the effect of construction-related and long-term indirect impacts to jurisdictional aquatic resources would be minimized to **less than significant with mitigation incorporated.**

Outside BSA

An aquatic resources delineation was not conducted for the portion of Samarkand Drive located outside the BSA. Future development outside the BSA has the potential to result in indirect impacts to jurisdictional aquatic resources. Indirect impacts to jurisdictional aquatic resources outside the BSA would be the same as Project-Level impacts. With implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources), the effect of construction-related and long-term indirect impacts to jurisdictional aquatic resources outside the BSA would be minimized to **less than significant with mitigation incorporated.**

6.3.4 Impact BIO-4: Wildlife Corridors and Habitat Linkages

6.3.4.1 Direct Impacts

Project-Level Impacts

The BSA is currently undeveloped land located within the established habitat linkage areas for desert tortoise and burrowing owl that would also allow for viable populations of smaller terrestrial species and/or species' dispersal movements through the BSA and the immediate vicinity. The proposed project is required to avoid impacts to desert tortoise individuals as directed by **MM-BIO-3** (Desert Tortoise Avoidance and Minimization Measures), avoid impacts to burrowing owl individuals and mitigation for potential occupied habitat as directed by **MM-BIO-5** (Pre-Construction Burrowing Owl Surveys and Avoidance), and **MM-BIO-4** (Desert Tortoise Habitat Compensatory Mitigation) would provide mitigation for loss of desert tortoise. Smaller terrestrial species dispersal movement would not be disrupted

by project implementation due to the significant amount of vacant and undeveloped land for wildlife to cross through within the surrounding area. However, compensatory mitigation for loss of desert tortoise occupied habitat would also provide habitat for these smaller terrestrial species using the project site. The BSA also overlaps a potential movement corridor with low to moderate permeability for bobcat (i.e., Joshua Tree-Twentynine Palms Connection) but is outside any bighorn sheep linkages. Larger mammal species (e.g., bighorn sheep, mountain lion, bobcat) are not anticipated to use the BSA or immediate vicinity due to the openness of the site, which would not provide enough cover for these species (i.e., site lacks escape terrain for bighorn sheep, and rocky outcrops, dense brush, or steep terrain preferred by mountain lion and bobcats). The BSA has a limited connectivity opportunity (ACE Rank 1) and would not be considered a significant regional wildlife corridor. Project implementation would not disrupt any existing regional migratory patterns on or near the site as there is a significant amount of vacant and undeveloped land for wildlife to cross through within the surrounding area. Furthermore, the desert tortoise fencing shall remain in place for the duration of project operations (e.g., excluding all wildlife from entering the project) as recommended by USFWS and CDFW. Therefore, direct impacts to wildlife movement and corridors would be **less than significant**.

Future Road Dedication Impacts

Within BSA

Direct impacts to wildlife movement and corridors from the Future Road Dedication areas would be the same as Project-Level impacts. Direct impacts to wildlife movement and corridors from the Future Road Dedication areas would be **less than significant**.

Outside BSA

Direct impacts to wildlife movement and corridors from the Future Road Dedication areas outside the BSA would be the same as Project-Level impacts. Direct impacts to wildlife movement and corridors from the Future Road Dedication areas would be **less than significant**.

6.3.4.2 Indirect Impacts

Project-Level Impacts

Construction-Related

Potential short-term or temporary indirect impacts to wildlife movement resulting from construction activities include adverse effects from noise and vibration and increased human presence. These potential construction-related indirect impacts to wildlife movement would be potentially significant absent mitigation.

Project implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) would reduce potential indirect impacts during construction to a less-than-significant level by requiring implementation of biological monitoring and a WEAP Training that will cover the special-status resources and mitigation requirements for the project, delineation of project boundaries, and ensuring that construction will not be conducted at night. With implementation of **MM-BIO-2**, the effect of construction-related indirect impacts to wildlife movement would be minimized to **less than significant with mitigation incorporated.**

Long-Term

Potential long-term indirect impacts to wildlife movement that could result from operations and maintenance of the solar facility would be chemical releases such as oils and grease from vehicles that could degrade habitat; increased invasive plant species that may degrade habitat; and trampling of vegetation and soil compaction by humans, which could affect soil moisture, water penetration, surface flows, and erosion; and nighttime lighting. These potential long-term indirect impacts to wildlife movement would be potentially significant absent mitigation.

The solar facility will be operated on an unstaffed basis and monitored remotely, with on-site personnel visitations for security, maintenance, and system monitoring on an as-needed and likely in-frequent basis. However, project implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) would reduce potential long-term indirect impacts to a less-than-significant level by requiring operation and maintenance personnel to watch a WEAP Training recording, and requiring measures to ensure runoff is not altered from existing conditions and toxicants are not discharged; stipulations that night-lighting will not be directed towards open space areas; and application of a native seed mix to promote passive restoration of temporary impact areas. With implementation of **MM-BIO-2**, the effect of long-term indirect impacts to wildlife movement would be minimized to **less than significant with mitigation incorporated.**

Future Road Dedication Impacts

Within BSA

Indirect impacts to wildlife movement and corridors from the Future Road Dedication areas would be the same as Project-Level impacts. With implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources), the effect of construction-related and long-term indirect impacts to wildlife movement and corridors would be minimized to **less than significant with mitigation incorporated.**

Outside BSA

Indirect impacts to wildlife movement and corridors from the Future Road Dedication areas outside the BSA would be the same as Project-Level impacts. With implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources), the effect of construction-related and long-term indirect impacts to wildlife movement and corridors would be minimized to **less than significant with mitigation incorporated.**

6.3.5 Impact BIO-5: Associated with Local Policies and Ordinances

California Desert Native Plants

A total of 4,562 desert native plants were observed within the BSA during the focused desert native plant survey, including the following species: silver cholla, branched pencil cholla, cottontop cactus, Engelmann's hedgehog cactus, California barrel cactus, beavertail prickly pear, honey mesquite, Mojave yucca, smoke tree, and catclaw acacia.

Riparian Plant and Soil and Water Conservation

Chapter 88.01.080 of the San Bernardino County Development Code is focused on promoting the health of riparian corridors in relation to their impact on waterways within the region, including stabilization of stream banks. San Bernardino County Soil and Water Conservation Code, Chapter 88.02 of the San Bernardino County Development Code, provides regulatory framework to promote the health of soil communities within the County, limit soil erosion potential, and preserve air quality.

City staff has confirmed that the City defers to County requirements with regard to riparian corridors and health of soil communities and therefore, consistency with City requirements is not explicitly addressed here.

6.3.5.1 Direct Impacts

Project-Level Impacts

California Desert Native Plants

A total of 3,088 desert native plant individuals are located within the Project-Level impact footprint (Figure 14, Impacts to California Desert Native Plants) including: 1,019 silver cholla, 1,869 branched pencil cholla, 3 cottontop cactus, 13 California barrel cactus, 9 beavertail prickly pear, and 175 Mojave yucca individuals. Therefore, in accordance with the CDNPA and Chapter 88.01.060, Desert Native Plant Protection, of the San Bernardino County Development Code, the project applicant shall submit an application and applicable fees paid to City of Twentynine Palms for removal of protected native desert plants as required by **MM-BIO-10** (Desert Native Plants Removal Permit). If relocation is proposed, a relocation plan shall be prepared, including detailed specifications on the transplant location and watering schedule as determined by the qualified desert native plant expert. With implementation of **MM-BIO-10**, impacts to desert native plants would be minimized to **less than significant with mitigation incorporated.**

Riparian Plant and Soil and Water Conservation

The project has been designed to avoid all impacts to jurisdictional waterways. Implementation of **MM-BIO-9** (Avoidance and Minimization of Impacts to Potential Jurisdictional Aquatic Resources) would require avoidance and minimization measures when ground-disturbing activities occur within 25 feet of waters of the state and/or jurisdictional streambeds, and implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) would reduce potential soil erosion and air quality through implementation of standard dust control measures and development of a stormwater pollution prevention plan (SWPPP). With implementation of **MM-BIO-9** and **MM-BIO-2**, impacts to waterways and soils protected under the San Bernardino County Development Code would be minimized to **less than significant with mitigation incorporated.**

Future Road Dedication Impacts

California Desert Native Plants

Within BSA

A total of 146 desert native plant individuals are located within the Future Road Dedication areas (Figure 14) including: 37 silver cholla, 86 branched pencil cholla, 5 beavertail prickly pear, 6 smoketree wash, and 12 Mojave

yucca individuals. Specifically, a total of 2 desert native plants would be impacted by Amboy Road, 42 desert native plants would be impacted by Noels Knoll Road, and 102 desert native plants would be impacted by Samarkand Drive. Similar to the Project-Level impacts, compliance with the CDNPA and Chapter 88.01.060, Desert Native Plant Protection, of the San Bernardino County Development Code would be required for the Future Road Dedication areas. With implementation of **MM-BIO-10** (Desert Native Plants Removal Permit), direct impacts to desert native plants from the Future Road Dedication areas would be **less than significant with mitigation incorporated**.

Outside BSA

Desert native plant surveys were not conducted outside the BSA for Samarkand Drive. Therefore, Future development outside the BSA has the potential to result in impacts to desert native plants if present. Direct impacts to desert native plants outside the BSA would be the same as Future Road Dedication impacts within the BSA. With implementation of **MM-BIO-1** (Future Road Dedication Focused Surveys, Avoidance, and Mitigation Outside the BSA), **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources), and **MM-BIO-10** (Desert Native Plants Removal Permit), direct impacts to desert native plants if present outside the BSA would be **less than significant with mitigation incorporated**.

Riparian Plant and Soil and Water Conservation

Within BSA

The Future Road Dedication areas would result in impacts to resources regulated under Chapter 88.01.080 and Chapter 88.02 of the San Bernardino County Development Code. Implementation of **MM-BIO-8** (Sensitive Vegetation Communities and Jurisdictional Resources Mitigation) will mitigate for direct, permanent impacts to waters of the state through either an approved mitigation bank or through a combination of on-site and/or off-site mitigation. In addition, **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) would require that all workers complete WEAP training, would require biological monitoring and compliance with all biological resource mitigation requirements, and require that impacts occur within the fenced, staked, or flagged area that is clearly delineated within the project impact footprint. The construction crew would be responsible for unauthorized impacts from construction activities to waters of the state that are outside the permitted project footprint, if applicable. Therefore, impacts to resources regulated under Chapter 88.01.080 and Chapter 88.02 of the San Bernardino County Development Code from the Future Road Dedications would be **less than significant with mitigation incorporated**.

Outside BSA

Surveys were not conducted outside the BSA for Samarkand Drive. Therefore, Future development outside the BSA has the potential to result in impacts to resources regulated under Chapter 88.01.080 and Chapter 88.02 of the San Bernardino County Development Code if present. Direct impacts to resources regulated under Chapter 88.01.080 and Chapter 88.02 of the San Bernardino County Development Code outside the BSA would be the same as Future Road Dedication impacts within the BSA if present. With implementation of **MM-BIO-1** (Future Road Dedication Focused Surveys, Avoidance, and Mitigation Outside the BSA), **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) and **MM-BIO-8** (Sensitive Vegetation Communities and Jurisdictional Resources Mitigation), direct impacts to resources regulated under Chapter 88.01.080 and Chapter 88.02 of the San Bernardino County Development Code if present outside the BSA would be **less than significant with mitigation incorporated**.

6.3.5.2 Indirect Impacts

Project-Level Impacts

Construction-Related

Potential short-term or temporary indirect impacts to desert native plant species resulting from construction activities include inadvertent spillover impacts, including unintentional clearing, trampling, or grading outside the project footprint; generation of fugitive dust; changes in hydrology resulting from construction, including sedimentation and erosion; and the release of chemical pollutants. These potential construction-related indirect impacts to desert native plant species would be potentially significant absent mitigation.

Project implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) would reduce potential indirect impacts during construction to a less-than-significant level by requiring implementation of biological monitoring and a WEAP Training that will cover the special-status resources and mitigation requirements for the project; delineation of project boundaries; implementation of standard dust control measures; development of a stormwater pollution prevention plan (SWPPP); and ensuing toxicants are not discharged. With implementation of **MM-BIO-2**, the effect of construction-related indirect impacts to desert native plant species would be minimized to **less than significant with mitigation incorporated.**

Long-Term

Potential long-term indirect impacts that could result from operations and maintenance of the solar facility near desert native plant species would be chemical releases such as oils and grease from vehicles that could degrade habitat; increased invasive plant species that may degrade habitat; and trampling of vegetation and soil compaction by humans, which could affect soil moisture, water penetration, surface flows, and erosion. These potential long-term indirect impacts to desert native plant species would be potentially significant absent mitigation.

The solar facility will be operated on an unstaffed basis and monitored remotely, with on-site personnel visitations for security, maintenance, and system monitoring on an as-needed and likely in-frequent basis. However, project implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources) would reduce potential long-term indirect impacts to a less-than-significant level by requiring operation and maintenance personnel to watch a WEAP Training recording, and requiring measures to ensure runoff is not altered from existing conditions and toxicants are not discharged; application of a native seed mix to promote passive restoration of temporary impact areas and not include species from the California Invasive Plant Council (Cal-IPC) California Invasive Plant Inventory; and incorporation of perimeter fencing to prevent access to areas with potential habitat for special-status plants. With implementation of **MM-BIO-2**, the effect of long-term indirect impacts to desert native plant species would be minimized to **less than significant with mitigation incorporated.**

Future Road Dedication Impacts

Within BSA

Indirect impacts to desert native plants from the Future Road Dedication areas would be the same as Project-Level impacts. With implementation of **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources), the effect of construction-related and long-term indirect impacts to desert native plants would be minimized to **less than significant with mitigation incorporated.**

Outside BSA

Desert native plant surveys were not conducted outside the BSA for Samarkand Drive. Future development outside the BSA has the potential to result in indirect impacts to desert native plants. Indirect impacts to desert native plants outside the BSA would be the same as Project-Level impacts. With implementation of **MM-BIO-2**, the effect of construction-related and long-term indirect impacts to desert native plants outside the BSA would be minimized to **less than significant with mitigation incorporated.**

6.3.6 Impact BIO-6: Habitat Conservation Plans

There are no adopted habitat conservation plans overlapping the BSA or outside the BSA along Samarkand Drive. Therefore, the proposed project is not in conflict with any HCPs or NCCPs. Furthermore, the proposed project and its mitigation program is compliant with all local and regional plans and policies, as well as state and federal regulations. Therefore, the proposed project would not prevent any future HCPs from being approved. **No impact** would occur.

7 Mitigation

MM-BIO-1 Future Road Dedication Focused Surveys, Avoidance, and Mitigation Outside the BSA. If the portion of Samarkand Drive subject to the Future Road Dedication outside the biological survey area (BSA) is constructed by the City of Twenty-Nine Palms, prior to issuance of a grading permit for the Future Road Dedication area, the following surveys shall be conducted: a general biological reconnaissance survey, including vegetation mapping, special-status plant survey, western Joshua Tree focused survey, desert native plant survey, desert tortoise (*Gopherus agassizii*) protocol-level survey, burrowing owl (*Athene cunicularia*) protocol-level survey, and an aquatic resources delineation. Focused surveys shall be conducted in accordance with the methods described in Section 3.2.4, Special-Status and Regulated Resources, of the project-specific Biological Resources Technical Report. If surveys determine there are no sensitive natural vegetation communities, no potentially jurisdictional aquatic resources, and no special-status species occurrences, then no further CEQA documentation or mitigation measures would be required.

If the results of the general biological reconnaissance survey determine there are biological resources that are not evaluated in the Biological Resources Technical Report, then additional CEQA documentation would be required by the project applicant. If the general biological reconnaissance survey determines there are sensitive natural vegetation communities, and if jurisdictional aquatic resources, and/or desert native plants, desert tortoise, or burrowing owl are determined present, then the following applicable mitigation measures outlined below shall be implemented: **MM-BIO-2** (Construction-Related and Operational-Related Indirect Impacts to Biological Resources), **MM-BIO-3** (Desert Tortoise Avoidance and Minimization Measures), **MM-BIO-4** (Desert Tortoise Habitat Compensatory Mitigation), **MM-BIO-5** (Pre-Construction Burrowing Owl Surveys and Avoidance), **MM-BIO-6** (Pre-Construction Survey for Desert Kit Fox and Avoidance), **MM-BIO-7** (Pre-Construction Nesting Bird Survey), **MM-BIO-8** (Sensitive Vegetation Communities and Jurisdictional Resources Mitigation), **MM-BIO-9** (Avoidance and Minimization to Potential Jurisdictional Aquatic Resources), and **MM-BIO-10** (Desert Native Plants Removal Permit).

Should special-status plant species and/or western Joshua Tree be determined present and directly or indirectly impacted, then the following additional mitigation measures shall be implemented:

Special-Status Plants

Impacts to special-status plant occurrences shall be avoided to the greatest extent possible and minimized where avoidance is not feasible. Where Future Road Dedication impacts to special-status plant species cannot be avoided, mitigation is required. For direct impacts to special-status plant species, one or a combination of the following strategies shall be implemented:

- **Avoidance and Minimization.** Impacts to special-status plant occurrences shall be avoided to the greatest extent possible and minimized where avoidance is not feasible. Where Future Road Dedication impacts to special-status plant species cannot be avoided, mitigation is required and is discussed further below.
- **Salvage.** If impacts to special-status plants cannot be avoided and it is feasible to effectively salvage the plants, a qualified ecologist shall develop a restoration and mitigation plan based

on the life history of the species impacted, as necessary, to mitigate project impacts. The plan shall include, at minimum, (a) collection/salvage measures for plants and/or seed banks to retain intact soil conditions and maximize success likelihood; (b) details regarding storage of plants and/or seed banks; (c) location of the proposed recipient site and detailed site preparation and plant introduction techniques details for top soil storage, as applicable; (d) time of year that the salvage and replanting or seeding shall occur and the methodology of the replanting; (e) a description of the irrigation, if used; (f) success criteria; and (g) a detailed monitoring program, commensurate with the plan's goals.

Western Joshua Tree

Impacts to western Joshua tree shall be avoided to the greatest extent possible and minimized where avoidance is not feasible. If direct and indirect impacts to western Joshua tree cannot be avoided, mitigation is required. If avoidance is not feasible, and the construction of the Future Road Dedication will result in direct removal of western Joshua tree, a Westen Joshua Tree Conservation Act Incidental Take Permit or a Section 2081 Incidental Take Permit from CDFW shall be required prior to construction.

If the portion of Samarkand Drive subject to the Future Road Dedications outside the BSA is constructed by the City of Twenty-Nine Palms, the project applicant shall be responsible for implementing this mitigation measure within such area prior to construction.

MM-BIO-2 Construction-Related and Operational-Related Indirect Impacts to Biological Resources. For each phase of project implementation, suitable habitat for special-status species (i.e., all undeveloped land within the project site) with potential to occur in the project, the project's Applicant/Developer shall include the following in the construction contractor's plans and specifications to address indirect construction-related impacts to special-status species:

- **Biological Monitoring.** A qualified project biologist shall conduct monthly checks throughout the duration of project construction in order to inspect construction fencing, ensure that practicable measures are being employed to avoid incidental disturbance of habitat, species of concern, and other sensitive biological resources outside the project footprint, and ensure that all applicable requirements from the mitigation measures are being upheld.
- **Worker Environmental Awareness Training.** Prior to grading, a pre-construction meeting shall be required that includes a training session for project personnel by the biological monitor. The training shall include (1) a description of the species of concern and its habitats; (2) the general provisions of the applicable regulations pertaining to biological resources, including the Endangered Species Act and the Clean Water Act; (3) the need to adhere to the provisions of the Endangered Species Act, the Clean Water Act, and other applicable regulations; (4) the penalties associated with violating the provisions of the Endangered Species Act, Clean Water Act, and other applicable regulations; (5) the general measures that are being implemented to conserve the species of concern as they relate to the project; and (6) the access routes to and from disturbance area boundaries within which the project activities must be accomplished. Additionally, the training shall include the measures and mitigation requirements for the applicable resources. Copies of the mitigation measures and any required permits from the resource agencies shall be made available to construction personnel. The video can be

recorded so that multiple personnel are able to watch the material. The training shall be provided in alternate languages, as needed. In addition, operations and maintenance personnel shall be required to watch the recorded training prior to entering the Project during operations, with the only exception including emergency situations. Copies of the mitigation measures and any required permits from the resource agencies shall be made available to operations and maintence personnel.

- **Delineation of Property Boundaries.** Before beginning activities that would cause impacts, the contractor shall, in consultation with the biological monitor, clearly delineate the boundaries with fencing, stakes, or flags, consistent with the grading plan, within which the impacts will take place. All impacts outside the fenced, staked, or flagged areas shall be avoided, and all fencing, stakes, and flags shall be maintained until the completion of impacts in that area. In addition, any avoided environmental resources shall be clearly delineated. Prior to implementing construction activities, the biological monitor shall verify that the flagging clearly delineates the construction limits and any sensitive environmental resources to be avoided.
- **Standard Dust Control Measures.** Standard dust control measures as per the Mojave Desert Air Quality Management District shall be implemented to reduce dust impacts on nearby conserved lands, plants, and wildlife. Measures include controlling speed to 15 mph or less on unpaved roads, replacing ground cover in disturbed areas as quickly as possible, frequently watering active work sites, installation of shaker plates, and suspending excavation and grading operations during periods of high winds.
- **Stormwater Pollution Prevention Plan.** Prior to issuance of a grading permit for construction, the applicant shall submit a stormwater pollution prevention plan (SWPPP) to the City of Twentynine Palms that specifies best management practices to prevent all construction pollutants from contacting stormwater, with the intent of keeping sedimentation or any other pollutants from moving off site and into receiving waters. The requirements of the SWPPP shall be incorporated into design specifications and construction contracts.
- **Minimize Spills of Hazardous Materials.** All vehicles and equipment shall be maintained in proper condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. Hazardous spills and contaminated soil shall be immediately cleaned up and the contaminated soil shall be properly handled or disposed of at a licensed facility. Servicing of construction equipment shall take place only at a designated staging area. Staging areas shall not be located within the project's avoidance areas.
- **Wildlife Hazards.** The following measures shall be implemented to ensure that wildlife do not become trapped, entangled, injured, or poisoned by constructuction activities:
  - Structures in which wildlife may become trapped (e.g., open pipes, pits, trenches, etc.) shall be tightly covered at the end of each work day. If covering the structure is not possible, an escape ramp shall be provided to allow any wildlife that falls in to safely escape.
  - Debris piles, construction materials, equipment, and other items that may be used as wildlife refuge shall be inspected for wildlife at the start of each work day and prior to disturbance. If wildlife is discovered, it shall either be moved out of harm's way by a qualified biologist or allowed to move off of the study area on its own.
  - Nets and mesh shall be made of loose-weave material that is not fused at the intersections of the weave, as nets with welded weaves present an entanglement risk.

- Toxic materials and garbage shall be removed from the work site and safely stored or disposed of at the end of each work day.

- **Invasive Weeds.** The project applicant shall be required to replant all temporarily impacted areas with native plants and remove invasive plants. The species proposed for replanting shall not include any plants found on the most recent version of the Cal-IPC California Invasive Plant Inventory (http://www.cal-ipc.org/ip/inventory/index.php).
- **Noise.** Proposed noise-generating land uses affecting suitable habitat for special-status species shall incorporate setbacks, berms, or walls to minimize the effects of noise on resources pursuant to applicable rules, regulations, and guidelines related to land use noise standards. For planning purposes, wildlife are not expected to be subjected to noise that would exceed rural residential noise standards.
- **Fencing.** The solar array site shall include a 7-foot-high perimeter fence upon completion of construction and through the duration of operation to minimize the impact on sensitive or special-status biological resources occurring adjacent to the site.
- **Lighting**. All construction activities shall be conducted during the daytime, and lights shall not be kept on overnight in the construction area. While night lighting is not currently proposed, if it is required for security purposes during construction activities or operational activities, all exterior lighting along undeveloped land shall be fully shielded and directed downward in a manner that will prevent light spillage or glare into the adjacent avoidance areas. As applicable, emergency maintenance work on the solar arrays at night would be performed using battery or gas-powered light stands that would be directed to the active work area.

MM-BIO-3 Desert Tortoise Avoidance and Minimization Measures. Relocation and/or take of a desert tortoise may not occur without consultation with the USFWS and CDFW. The phrases “authorized biologist” and “desert tortoise monitor,” as used herein, are taken from the most up to date USFWS guidance (USFWS 2009), and the definitions, roles, and responsibilities of each will be adhered to during construction. Also, in accordance with guidance in USFWS (2019), if tortoises or fresh sign are observed during project construction, all activities that could result in take of desert tortoise should cease immediately until an authorized biologist can confirm that no desert tortoise is present or the desert tortoise moves off the site on its own.

Project Site

Desert tortoise exclusion fencing shall be installed around all construction areas prior to the initiation of vegetation clearing. Once the area is fenced, desert tortoises shall be removed from the area by the authorized biologist if the appropriate state and federal permits have been obtained or be allowed to move off site on their own by creating a gap in the fence. Note that they cannot be “harassed” or otherwise directly encouraged to move off site without obtaining a federal take permit (or as directly authorized/directed by the USFWS and possibly CDFW). If the desert tortoise is allowed to move off site on its own, the gap in the exclusion fence will be closed once the tortoise has left the fenced area. After desert tortoise is no longer inside the fence, the fence shall be maintained in place until construction is completed. The purpose of the fence is to preclude all desert tortoises from the construction impact zone, including desert tortoises that may try to get back to their on-site burrow(s). A minimum of two tortoise-free pre-construction clearance survey passes conducted by the authorized biologist or desert tortoise monitor, after exclusion fencing

has been installed, are required to ensure that desert tortoises are no longer on the site and construction may commence. If the fence fails or is subject to gaps then two more tortoise-free survey passes must occur before work can resume.

The fence shall be constructed of 0.5-inch mesh hardware cloth and extend 18 inches above ground and 12 inches below ground. Where burial of the fence is not possible, the lower 12 inches shall be folded outward against the ground and fastened to the ground so as to prevent desert tortoise entry. The fence shall be supported sufficiently to maintain its integrity, be checked at least weekly during construction by the authorized biologist or desert tortoise monitor, and maintained when necessary, by the project proponent to ensure its integrity. Access points will be protected by installing the latest specification entrance gates/grates/etc. In all cases, the protection system will not include gaps sufficient for even the smallest hatchling to pass through. Common raven perching deterrents shall be installed as part of the fence construction. If unsupervised gaps are detected, then pre-construction clearance surveys will be required after remediation and prior to resumption of work.

All project-related facilities and construction-related areas, such as staging areas and personnel parking areas, other than the access road and Two Mile Road discussed below, shall occur within the fenced area. All related infrastructure shall also remain within the fenced area.

As part of the Worker Environmental Awareness Program (WEAP) training, all workers shall be informed to check beneath any parked vehicle immediately prior to moving the vehicle while in desert tortoise habitat outside fenced impact areas. After the desert tortoise-exclusion fence has been installed, all personal vehicles and construction equipment shall be parked inside the fenced area. Vehicular travel outside of established roads (including Samarkand Road, Sunrise Road, and private roads (once constructed) prior to removal of desert tortoises shall be prohibited. If a desert tortoise is found beneath a vehicle, the authorized biologist shall be contacted to move it from harm's way, if the appropriate state and federal permits have been obtained. Alternatively, the vehicle shall not be moved until the desert tortoise has left of its own accord. The authorized biologist shall be responsible for taking appropriate precautions to ensure that any desert tortoise moved in this manner is not exposed to temperature extremes that could be harmful to the animal.

The desert tortoise exclusion fence during construction shall have as part of its design either a desert-tortoise-proof cattle guard, desert tortoise exclusion gate, exclusion grate, or a breakaway portion of fence that can be opened and closed to allow vehicle access. The gate or modified fence shall remain closed at all times during construction except to allow vehicles to enter or leave the site. This measure may be modified if the desert tortoise monitor, based on surveys of surrounding areas, determines that there is little or no likelihood of desert tortoises entering the site through the opening. If the authorized biologist determines that the gate may be left open and subsequently finds that a desert tortoise has entered the construction area through that opening, a gate or modified fence shall be installed and kept closed after desert tortoise has left the site.

Prior to installing the fence, the authorized biologist shall survey the area along which the fence will be installed, with the goal of establishing a fenced area that allows for as many desert tortoise burrows to remain outside the fenced area while still accommodating project construction. The authorized biologist shall consider the direction of the burrow and know that burrows may be 30 to

40 feet long. So, not only the burrow opening, but also the burrow's end, shall be considered and excluded if the fence line is to be altered. Any desert tortoise burrows found within the proposed fence line that cannot be avoided shall be hand excavated by the authorized biologist prior to clearing of the fence line or installation of the fence. Burrow excavation procedures are discussed in Desert Tortoise Council (1999). The authorized biologist or desert tortoise monitors shall remain on-site to monitor the installation of the fence.

After installing the fence, and before any other activities occur within the fenced area, the authorized biologist shall survey the site for desert tortoises. If possible, the surveys shall occur immediately after installation of the fence and several days prior to brushing or grading activities. The site shall be searched at least two consecutive times with a negative survey result, meaning if the site is searched and desert tortoise are found, two additional surveys must be completed until the result is negative. Burrows shall either be excavated as they are found or flagged for excavation later. Each burrow shall also be carefully checked for viable desert tortoise eggs. If found, the authorized biologist shall have a plan for disposition of these eggs outside the impact zone but within the adjacent area and move the eggs in such a way that the viability of the eggs is not adversely affected by their movement (Desert Tortoise Council 1999). Handling of desert tortoise eggs would require consultation with CDFW and the USFWS.

Security fencing shall be placed inside of the desert tortoise exclusion fencing, which shall remain in place for the duration of project operations (e.g., excluding all wildlife from entering the Project), as recommended by USFWS and CDFW (Lalumiere, pers. comm. 2025).

Off-Site Gen-Tie Line/Access Road Alignment/Substation and Future Road Dedications

Prior to conducting vegetation clearing or grading activities in desert tortoise habitat outside permanently fenced areas of the project site (i.e., off-site access road, gen-tie alignment, and substation), the authorized biologist or desert tortoise monitor under the supervision of an authorized biologist will survey the access road impact area immediately prior to conducting these activities to ensure that no desert tortoises are present. Because of the linear nature of the access road, the applicant may conduct surveys at any time of year but shall avoid impacts to potential and known desert tortoise burrows, in addition to avoiding impacts to desert tortoises. Potential burrows will be buffered by 30 feet unless they can be shown to be unoccupied, or the authorized biologist believes a smaller buffer is appropriate in order to protect underground burrows. Examples of situations where smaller buffers may be appropriate may include the following: burrow entrances are obviously oriented away from the impact area; the type of activity near the burrow is not likely to impact desert tortoise (e.g., the activity will not have the potential to crush a burrow); the burrow is adjacent to an existing thoroughfare that receives vehicle use already and the proposed activity is similar in nature; etc. Temporary desert tortoise exclusion fencing will be installed along the access road. Once construction along the access road is completed, the desert tortoise exclusion fencing shall be removed. No vehicle or equipment parked outside any of the fenced areas will be moved prior to inspecting the ground beneath the vehicle or equipment for the presence of desert tortoise. If present, the desert tortoise will be left to move on its own.

In addition to the mitigation measures described above by project location, the following additional avoidance and minimization measures will be implemented for both the project site, and the access road:

- Prior to initiation of construction activities, the applicant shall develop a WEAP, to be presented to all construction and contractor personnel, that includes the following information and requirements for desert tortoise:
  - A description of the desert tortoise, including adults and juveniles
  - Color photographs of desert tortoise
  - Protections to the desert tortoise under the Federal and California Endangered Species Acts and potential penalties for violating the Federal and California Endangered Species Acts
  - Measures implemented under the project to protect desert tortoises and to conserve their habitat
  - The requirement that all workers shall check beneath any parked vehicle immediately prior to moving the vehicle while in desert tortoise habitat outside fenced impact areas and what to do if a desert tortoise is found
  - Information for contacting the authorized biologist or desert tortoise monitor in case personnel observe one or more desert tortoises on the project site
  - All trash that may attract desert tortoise predators (e.g., ravens, domestic dogs) shall be removed from the work site at the end of each day.
  - If desert tortoises occur in a work area and will not leave of their own accord, then it will be necessary to coordinate with the USFWS and CDFW. Physical relocation of a desert tortoise may not occur unless approved by the wildlife agencies, and this may require authorizations pursuant to Incidental Take Permits from the USFWS and CDFW.
  - The biological monitors shall have the authority to stop work at all times, if proper avoidance measures are not in place or project activities may potentially result in impacts to desert tortoises.
  - A speed limit of 15 mph shall be maintained at all times except on county/state roads.
  - Work shall be restricted to daylight hours at all times when working within or adjacent to desert tortoise habitat, except in an emergency, to avoid vehicle traffic when tortoise may be on access roads at times of poor visibility.

If the roads subject to the Future Road Dedications are constructed by the City of Twenty-Nine Palms, the project applicant shall be responsible for implementing this mitigation measure within the Future Road Dedication areas prior to construction, in the same manner as described for the access road above.

MM-BIO-4 Desert Tortoise Habitat Compensatory Mitigation. The project applicant shall implement habitat mitigation for 142.1 acres of permanent impacts to occupied desert tortoise habitat. Permanent impacts to occupied desert habitat shall be compensated at a minimum 1:1 ratio either through one or a combination of the following:

1. Purchase of off-site habitat mitigation lands that contain suitable habitat for desert tortoise (the off-site habitat mitigation lands would be conserved through a conservation easement,

include the preparation of a long-term Preserve Management Plan, managed in perpetuity by a suitable management entity, and funded by a non-wasting endowment informed by a PAR analysis [or similar estimator])

2. Purchase of mitigation credits at a mitigation bank for desert tortoise

The applicant shall submit a document outlining the permanent impacts to desert tortoise habitat, along with a compensatory mitigation plan, to the USFWS and CDFW for review and approval.

The project applicant shall also be required to obtain an Incidental Take Permit (ITP) from the California Department of Fish and Wildlife (CDFW) under Section 2081 of California Fish and Game Code and from the USFWS under Section 7 and/or Section 10 of the Endangered Species Act. The ITP process shall be coordinated with the CDFW and USFWS regional offices. The ITP shall include an analysis of whether project impacts would jeopardize the continued existence of the species, provide suitable avoidance and minimization measures to reduce potential impacts, and adequate mitigation through conservation or mitigation banking. Unavoidable impacts to occupied suitable habitat shall be compensated at a minimum of 1:1, as described above, in addition to implementing all other measures and conditions of the ITPs.

If the roads subject to the Future Road Dedications are constructed by the City of Twenty-Nine Palms, the project applicant shall be responsible for mitigation of 9.4 acres of permanent impacts to occupied desert tortoise habitat within the Future Road Dedication areas, including 2.7 acres along the Amboy Road dedication, 3.6 acres along the Noels Knoll Road dedication, and 3.1 acres along the Samarkand Drive dedication, in the same manner as described above for Project-Level impacts.

MM-BIO-5 Pre-Construction Burrowing Owl Surveys and Avoidance. One pre-construction burrowing owl survey shall be completed no more than 14 days before initiation of site preparation or grading activities and a second survey shall be completed within 24 hours of the start of site preparation or grading activities. If ground-disturbing activities are delayed or suspended for more than 30 days after the pre-construction surveys, the project site shall be resurveyed. Surveys for burrowing owl shall be conducted in accordance with protocols established in the Staff Report on Burrowing Owl Mitigation (prepared by the California Department of Fish and Game [now California Department of Fish and Wildlife; CDFW]) in 2012 or current version.

If burrowing owls are detected, and if impacts to burrowing owl cannot be feasibly avoided, the project applicant will consult with California Department of Fish and Wildlife (CDFW) and obtain appropriate take authorization from the CDFW through the California Endangered Species Act (CESA) Incidental Take Permit process.

In the event an Incidental Take Permit is needed, mitigation for direct impacts to burrowing owl shall be fulfilled through compensatory mitigation at a minimum 1:1 habitat replacement of equal or better functions and values to those impacted by the Project, or as otherwise determined through the Incidental Take Permit process. Mitigation shall be accomplished either through off-site conservation or through a CDFW-approved mitigation bank. If mitigation is not purchased through a mitigation bank, and lands are conserved separately, a cost estimate shall be prepared to estimate the initial start-up costs and ongoing annual costs of management activities for the management of the conservation easement area(s) in perpetuity. The funding source shall be in

the form of an endowment to help the qualified natural lands management entity that is ultimately selected to hold the conservation easement(s). The endowment amount shall be established following the completion of a Project-specific Property Analysis Record to calculate the costs of in-perpetuity land management. The Property Analysis Record shall take into account all management activities required in the Incidental Take Permit to fulfill the requirements of the conservation easement(s), which are currently in review and development.

MM-BIO-6 Pre-Construction Survey for Desert Kit Fox and Avoidance. A pre-construction survey for desert kit fox shall be conducted within 10 days before initiation of site preparation or grading activities to determine the presence/absence of desert kit fox.

If desert kit fox is detected, the Desert Kit Fox Relocation and Mitigation Plan shall be implemented. As required by the Desert Kit Fox Relocation and Mitigation Plan, if an active non-natal desert kit fox den is detected, a 200-foot no disturbance buffer shall be established around the active den, unless otherwise authorized by the California Department of Fish and Wildlife (CDFW). Where required buffering will not be feasible, passive relocation, as outlined in the Desert Kit Fox Relocation and Mitigation Plan, shall be allowed with concurrence from the City of Twentynine Palms, CDFW, and U.S. Fish and Wildlife Service. If an active natal desert kit fox den is detected, an initial 200 foot no disturbance buffer shall be established around the natal den, and this buffer shall be maintained until the den can be verified to not host pups. Construction activities shall not be permitted in this area until the den has been vacated. Once the den is vacated, and if in danger by construction, it can be collapsed, if deemed necessary by a qualified biologist.

A report to evaluate the success of the relocation efforts and any subsequent re-occupation, if applicable, shall be provided (including a comprehensive summary, tables, maps, and other necessary materials) at the end of the construction period. Data shall be readily available to the CDFW upon request. If an injured, sick, or dead desert kit fox is detected on any area associated with the project, the designated CDFW personnel at both the Ontario office and the Wildlife Investigation Lab shall be notified as described within the Desert Kit Fox Relocation and Mitigation Plan.

MM-BIO-7 Pre-Construction Nesting Bird Survey. If construction activities must occur during the migratory bird nesting season (typically January 1 through July 31), an avian nesting survey of the project site and within 500 feet of all impact areas must be conducted to determine the presence/absence of fully protected species, protected migratory birds, and active nests. The avian nesting survey shall be performed by a qualified wildlife biologist within 72 hours prior to the start of construction in accordance with the Migratory Bird Treaty Act and California Fish and Game Code Sections 3503, 3503.5, and 3513. If an active bird nest is found, the nest shall be flagged and mapped on the construction plans along with an appropriate buffer established around the nest, which shall be determined by the biologist based on the species' sensitivity to disturbance (typically 300 feet for passerines and 500 feet for raptors and special-status species). The nest area shall be avoided until the nest is vacated and the juveniles have fledged. The nest area shall be demarcated in the field with flagging and stakes or construction fencing. On-site construction monitoring shall also be conducted when an active nest buffer is in place. No project activities may encroach into established buffers without the consent of a monitoring biologist. The buffer shall remain in place until it is determined the nestlings have fledged and the nest is no longer considered active.

MM-BIO-8 Sensitive Vegetation Communities and Jurisdictional Resources Mitigation. If the roads subject to the Future Road Dedications are constructed by the City of Twenty-Nine Palms, prior to issuance of a grading permit for the Future Road Dedication areas, permanent impacts to the sensitive vegetation community (e.g., desert willow–smoketree wash woodland), will be mitigated at not less than a 1:1 ratio through preservation of the same vegetation community either on site, off site, or through a CDFW approved mitigation bank. The Future Road Dedication areas shall also mitigate to ensure no-net-loss of jurisdictional aquatic resources at a minimum of 1:1 with purchase of credits at an approved mitigation bank including Regional Water Quality Control Board/California Department of Fish and Wildlife jurisdiction. Mitigation shall be completed through use of a mitigation bank (e.g., Black Mountain Conservation Bank) or other applicant-sponsored mitigation either on site or off site. Final mitigation ratios and credits shall be determined in consultation with the resource agencies but will be no less than a 1:1 mitigation ratio. Should applicant-sponsored mitigation be implemented, a Habitat Mitigation and Monitoring Plan (HMMP) shall be prepared. The HMMP shall include a conceptual planting plan including planting zones, grading, and irrigation, as applicable; a conceptual planting plant palette; a long-term maintenance and monitoring plan; annual reporting requirements; and proposed success criteria. Any applicant-sponsored mitigation shall be conserved and managed in perpetuity.

Best management practices shall be implemented to avoid any indirect impacts on jurisdictional waters and sensitive vegetation communities as described in **MM-BIO-9** (Avoidance and Minimization of Impacts to Potential Jurisdictional Aquatic Resources).

MM-BIO-9 Avoidance and Minimization of Impacts to Potential Jurisdictional Aquatic Resources. The following avoidance and minimization measures would be implemented when ground-disturbing activities occur within 25 feet of waters of the state and/or jurisdictional streambeds (i.e., jurisdictional aquatic resources):

- All jurisdictional aquatic resources within 25 feet of project activities shall be fenced or flagged as environmentally sensitive areas prior to any ground disturbance.
- A biological monitor shall be present during construction activities within 25 feet of jurisdictional aquatic resources to ensure avoidance.
- Best Management Practices shall be implemented to avoid indirect impacts to jurisdictional waters, including:
  - Water containing mud, silt, or other pollutants from grading or other activities shall not be allowed to enter jurisdictional aquatic resources or be placed in locations that may be subjected to high storm flows.
  - Spoil sites shall not be located within jurisdictional aquatic resources or in locations that may be subject to high storm flows, where spoils might be washed into drainages.
  - Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous, resulting from project-related activities, shall be prevented from entering jurisdictional aquatic resources.
  - Equipment maintenance shall occur outside jurisdictional aquatic resources and in such a manner that no petroleum products or other pollutants from the equipment enters on- or off-site state-jurisdictional aquatic resources either directly or indirectly.

MM-BIO-10 Desert Native Plants Removal Permit. Prior to the issuance of grading permits, the project applicant shall submit an application and applicable fees paid to City of Twentynine Palms for removal of protected native desert plants under the California Desert Native Plants Act and Chapter 88.01.060 of the San Bernardino County Development Code. The project shall comply with any conditions of approval imposed by the City of Twentynine Palms upon issuance of the permit.

The permit application shall specify information outlined in the California Desert Native Plant Act Section 80114, which includes but is not limited to, the number and species of native plants to be removed, a description of the real property from which the plants are to be removed, and in the case that relocation is required, the destination of the native plants and the manner in which the plants are to be salvaged. Pursuant to the California Desert Native Plants Act, tags or seals issued by the City of Twentynine Palms must be attached to the native plants at the time of harvesting and before transporting to their permanent relocation site(s) and must remain attached to the plant until transplanted into its ultimate destination. Transport of salvaged plants will occur as prescribed by the City of Twentynine Palms.

If relocation is required by the applicable review authority, the following actions shall also be implemented to ensure successful relocation of desert native plants:

- Salvaged plants shall be transplanted expeditiously to either their final on-site location, or to an approved off-site area. If the plants cannot be expeditiously taken to their permanent relocation area at the time of excavation, they may be transplanted in a temporary area (stockpiled) prior to being moved to their permanent relocation site(s).
- Plants designated for relocation shall be marked on their north facing side prior to excavation. Transplanted plants shall be planted in the same orientation as they currently occur on the project site, with the marking on the north side of the trees facing north at the relocation site(s).
- Transplanted plants shall be watered prior to and at the time of transplantation. The schedule of watering shall be determined by the qualified desert native plant expert(s) to maintain plant health. Watering of the transplanted plants shall continue under the guidance of qualified desert native plant expert(s) until it has been determined that the transplants have become established in the permanent relocation site(s) and no longer require supplemental watering.

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8 Level of Significance After Mitigation

All direct and indirect impacts to sensitive and special-status biological resources that would result from implementation of the proposed project would be either less than significant or less than significant after mitigation.

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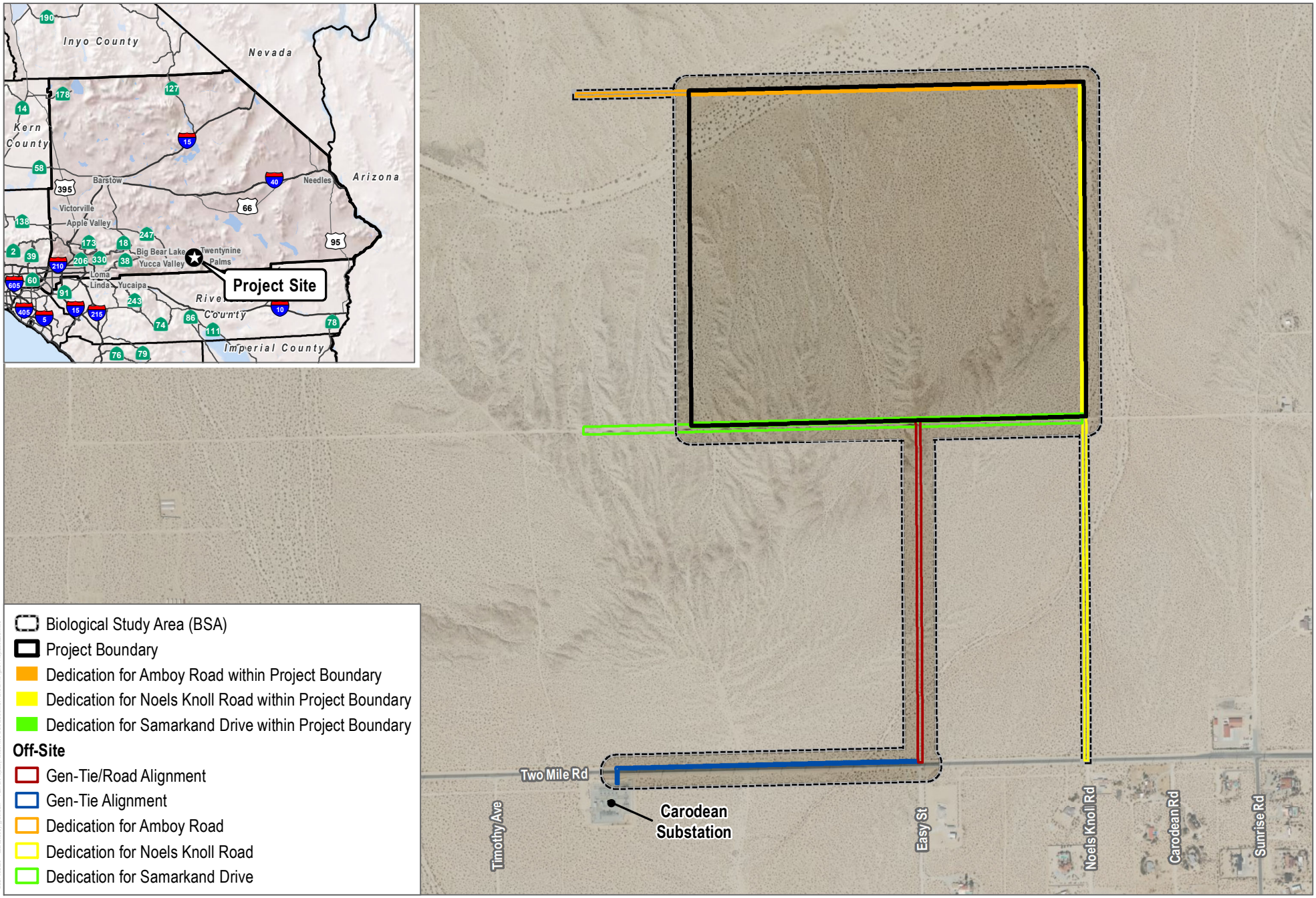
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Appendix A
Figures



SOURCE: NEXT Engineering Group, 2024; County of San Bernardino; Open Street Map; Bing Maps

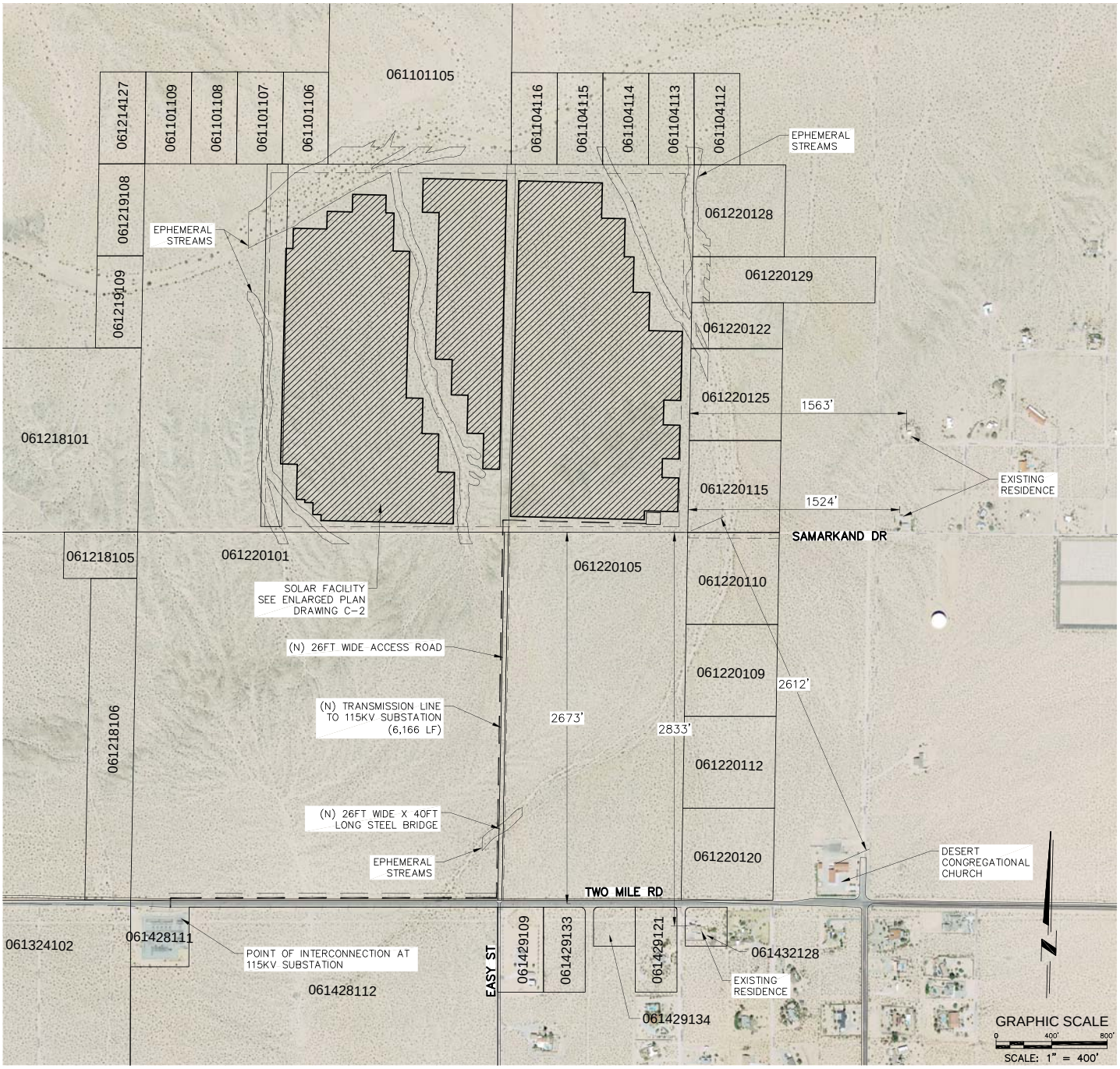
DUDEK

0 500 1,000 Feet

FIGURE 1

Project Location

E-Group PS Solar Project Biological Resources Technical Report



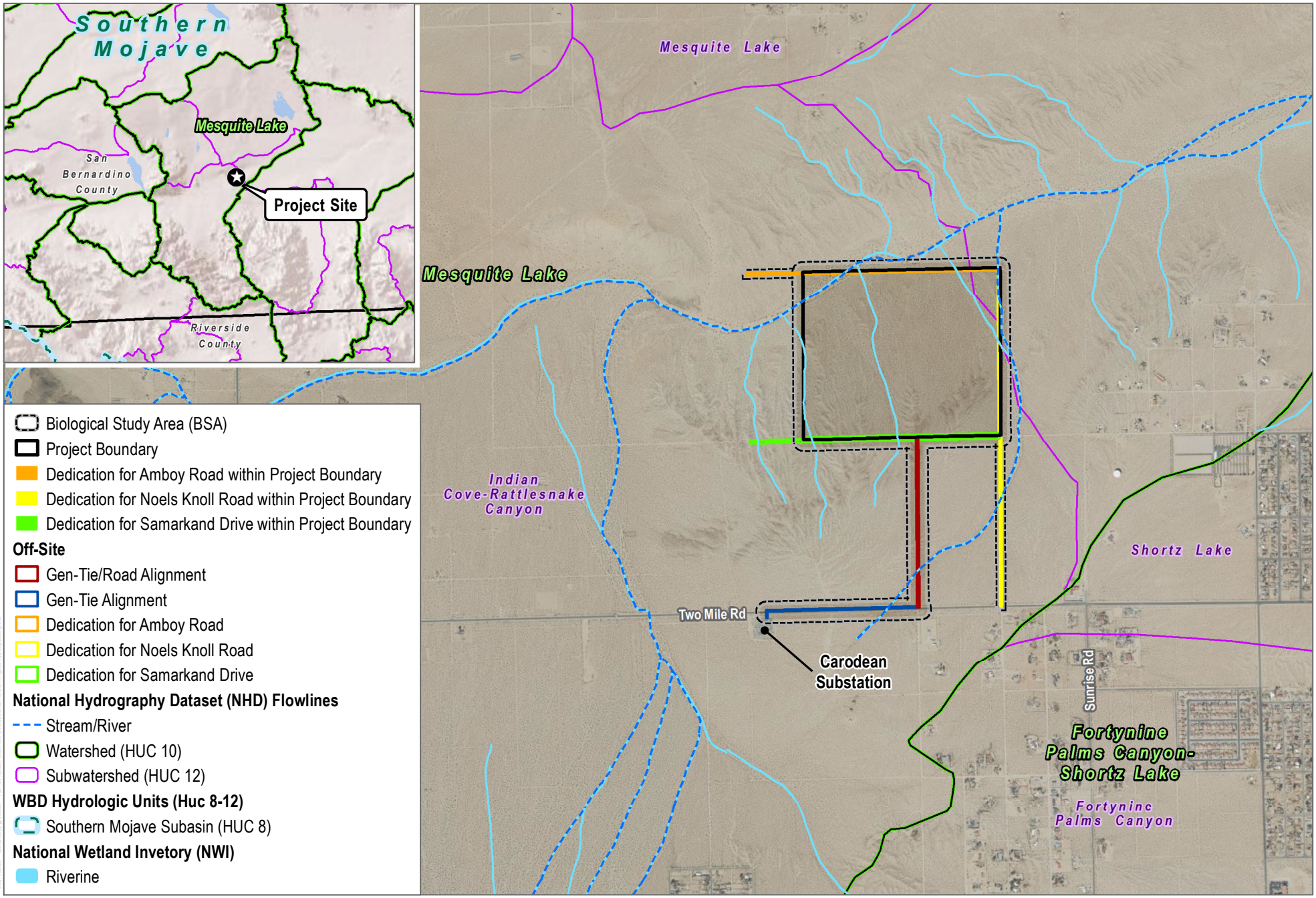
SOURCE: E-Group PS LLC, 2024

FIGURE 2

Site Plan

E-Group PS Solar Project

DUDEK



SOURCE: USFWS NWI; USGS NHD; County of San Bernardino; Open Street Map; Bing Maps

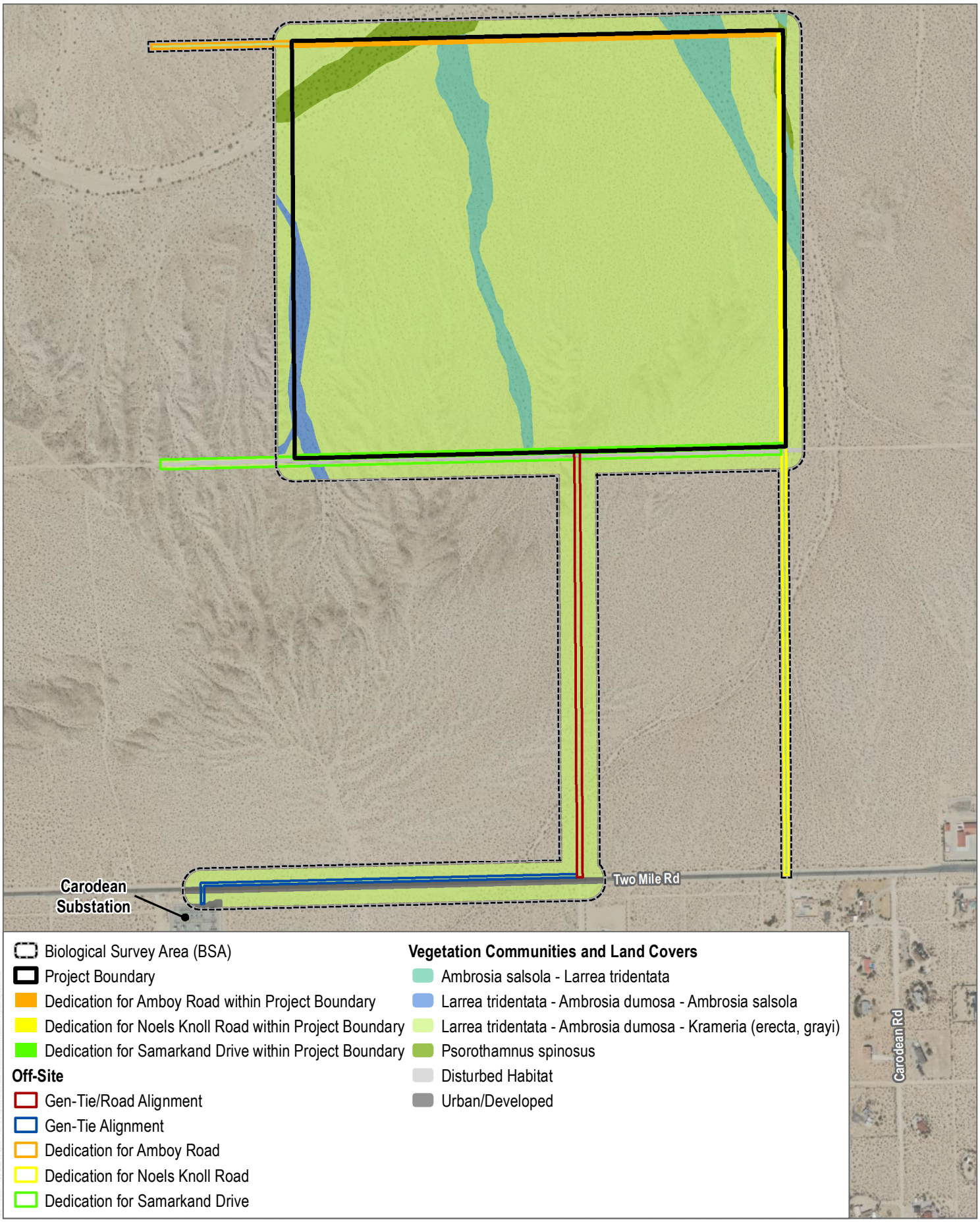
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FIGURE 3

Hydrologic Setting

E-Group PS Solar Project Biological Resources Technical Report



SOURCE: County of San Bernardino; Bing Maps

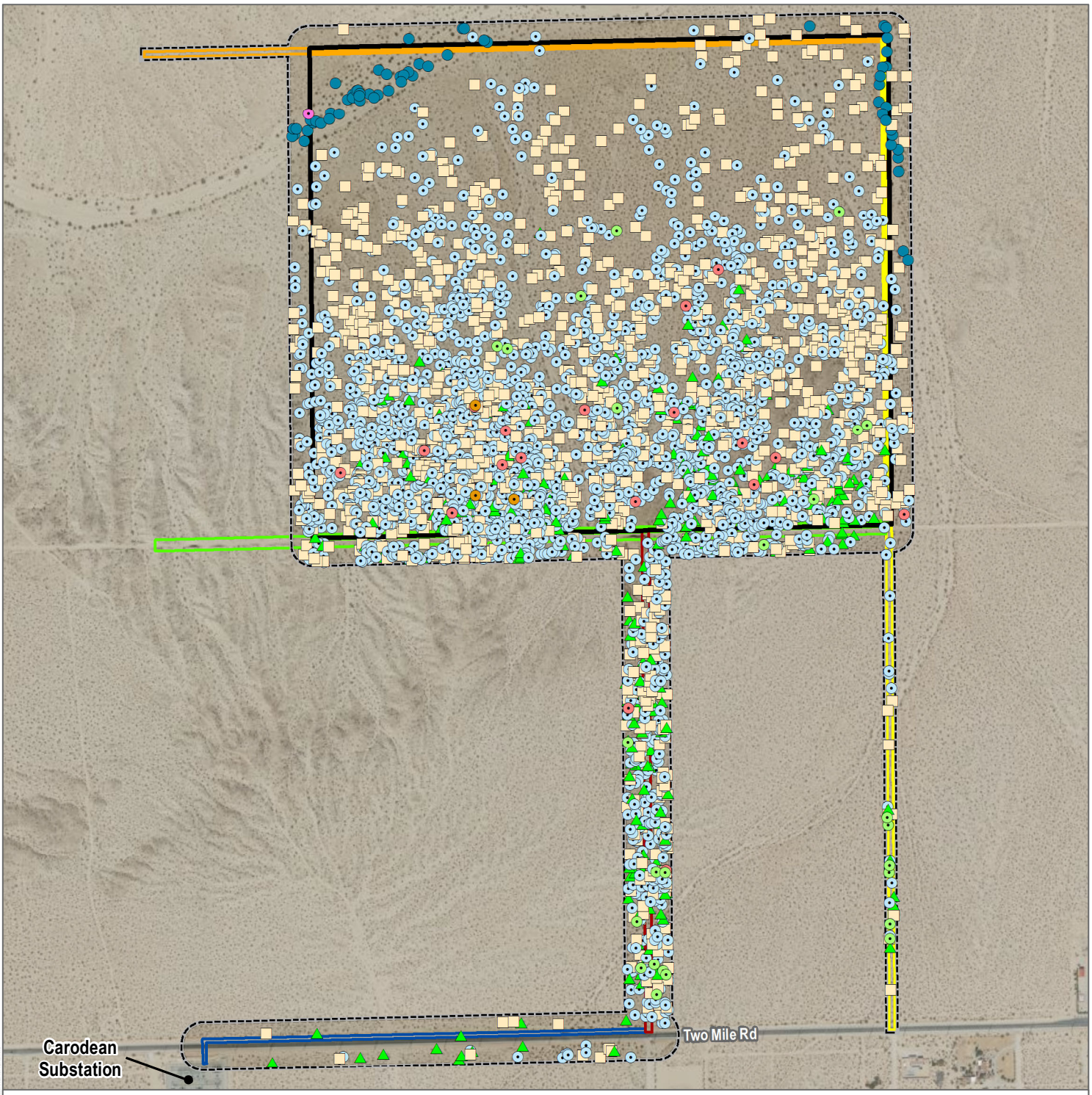
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FIGURE 4

Vegetation Communities and Land Covers

E-Group PS Solar Project Biological Resources Technical Report



Biological Survey Area (BSA)
Project Boundary
Dedication for Amboy Road within Project Boundary
Dedication for Noels Knoll Road within Project Boundary
Dedication for Samarkand Drive within Project Boundary

Off-Site

Gen-Tie/Road Alignment
Gen-Tie Alignment
Dedication for Amboy Road
Dedication for Noels Knoll Road
Dedication for Samarkand Drive

California Desert Native Plant Observations

beavertail pricklypear (*Opuntia basilaris var. basilaris*)
branched pencil cholla (*Cylindropuntia ramosissima*)
California barrel cactus (*Ferocactus cylindraceus*)
catclaw acacia (*Senegalia greggii*)
cottontop cactus (*Echinocactus polycephalus*)
Mojave yucca (*Yucca schidigera*)
silver cholla (*Cylindropuntia echinocarpa*)
smoketree wash (*Psorothamnus spinosus*)

SOURCE: County of San Bernardino; Bing Maps

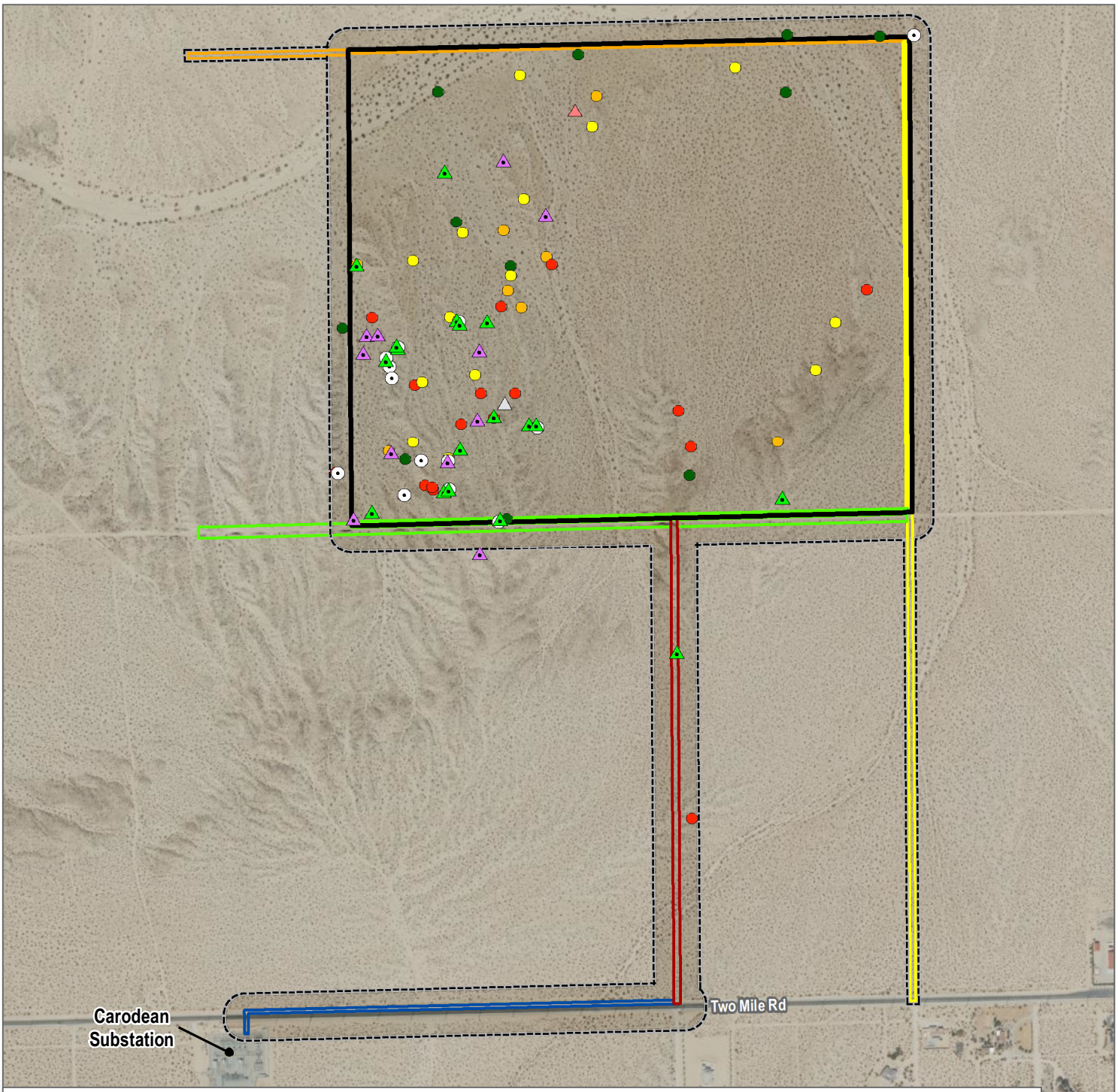
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FIGURE 5

California Desert Native Plant Act Survey Results

E-Group PS Solar Project Biological Resources Technical Report



SOURCE: County of San Bernardino; Bing Maps

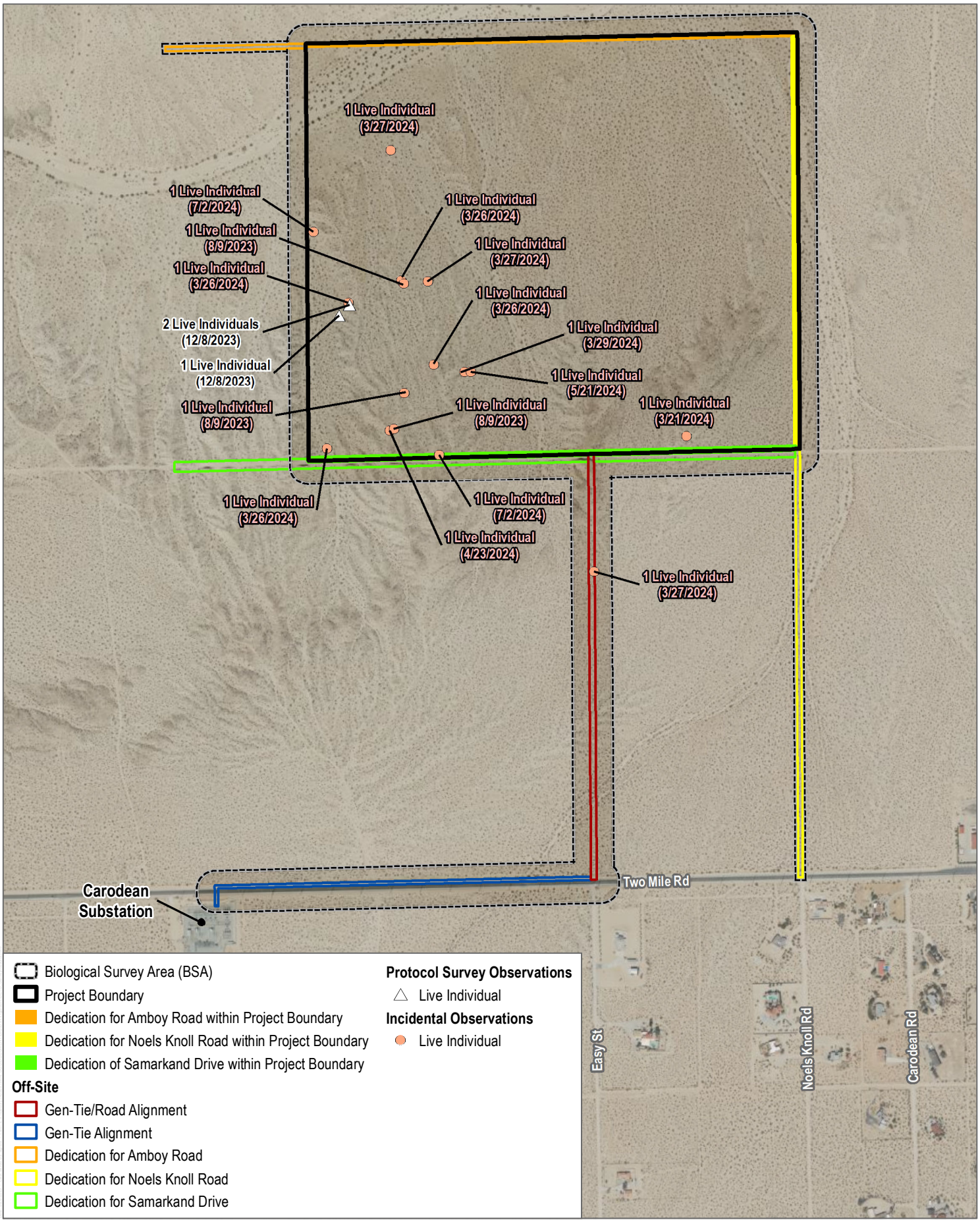
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FIGURE 6A

Desert Tortoise Protocol Survey Results and Incidental Observations

E-Group PS Solar Project Biological Resources Technical Report



SOURCE: County of San Bernardino; Bing Maps

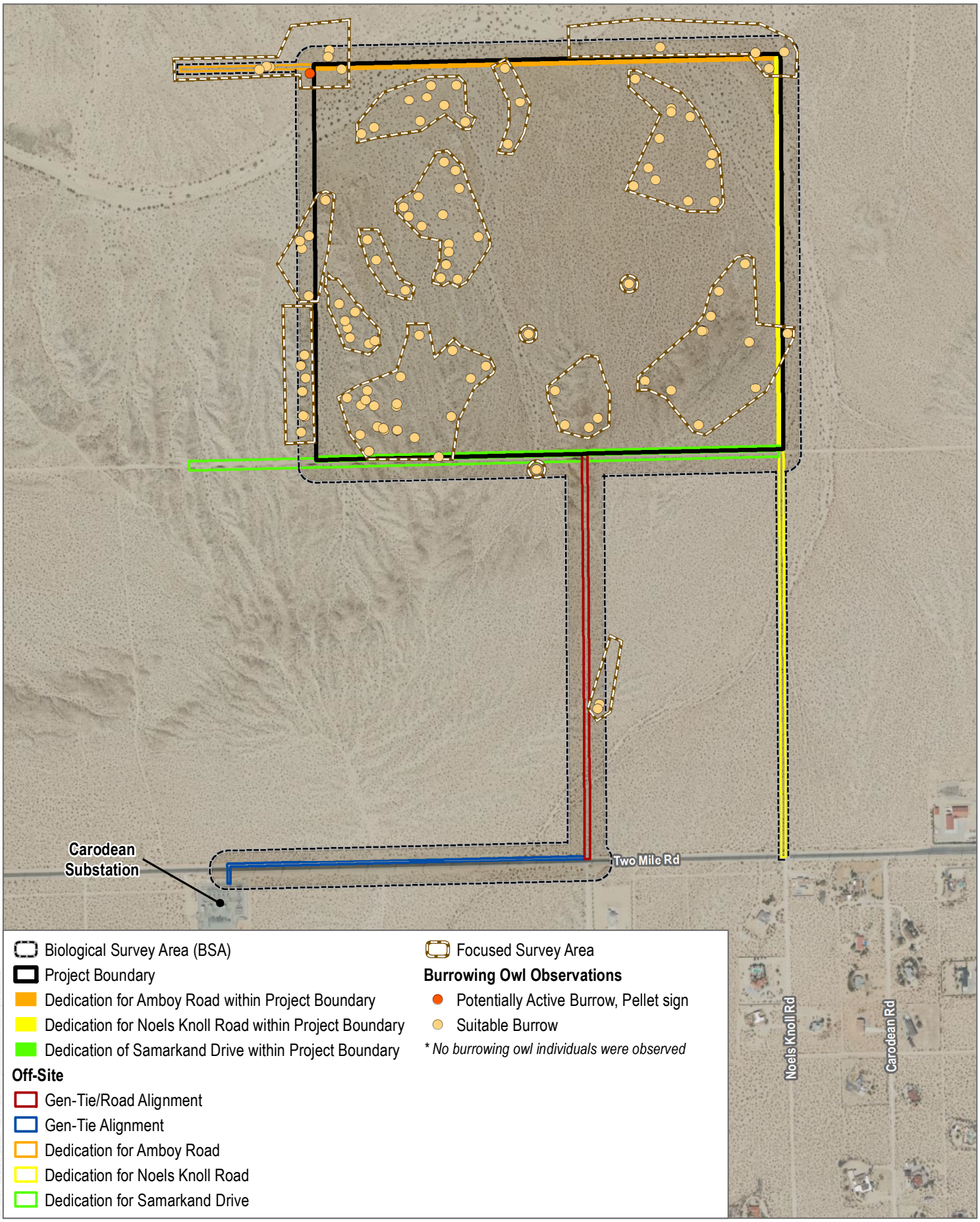
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FIGURE 6B

Desert Tortoise Live Individuals

E-Group PS Solar Project Biological Resources Technical Report



SOURCE: County of San Bernardino; Bing Maps

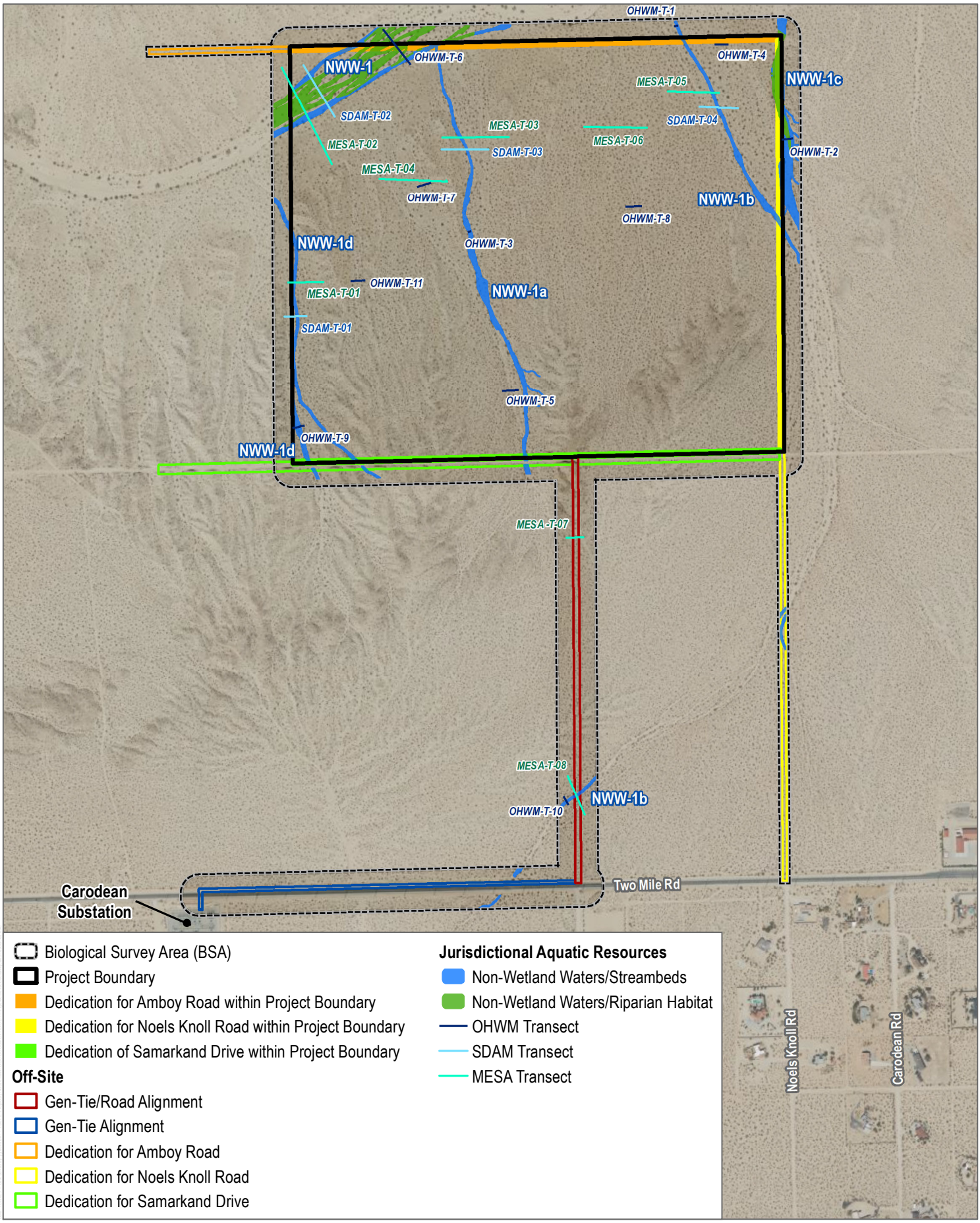
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FIGURE 7

Burrowing Owl Survey Results

E-Group PS Solar Project Biological Resources Technical Report



SOURCE: County of San Bernardino; Open Street Map; Bing Maps

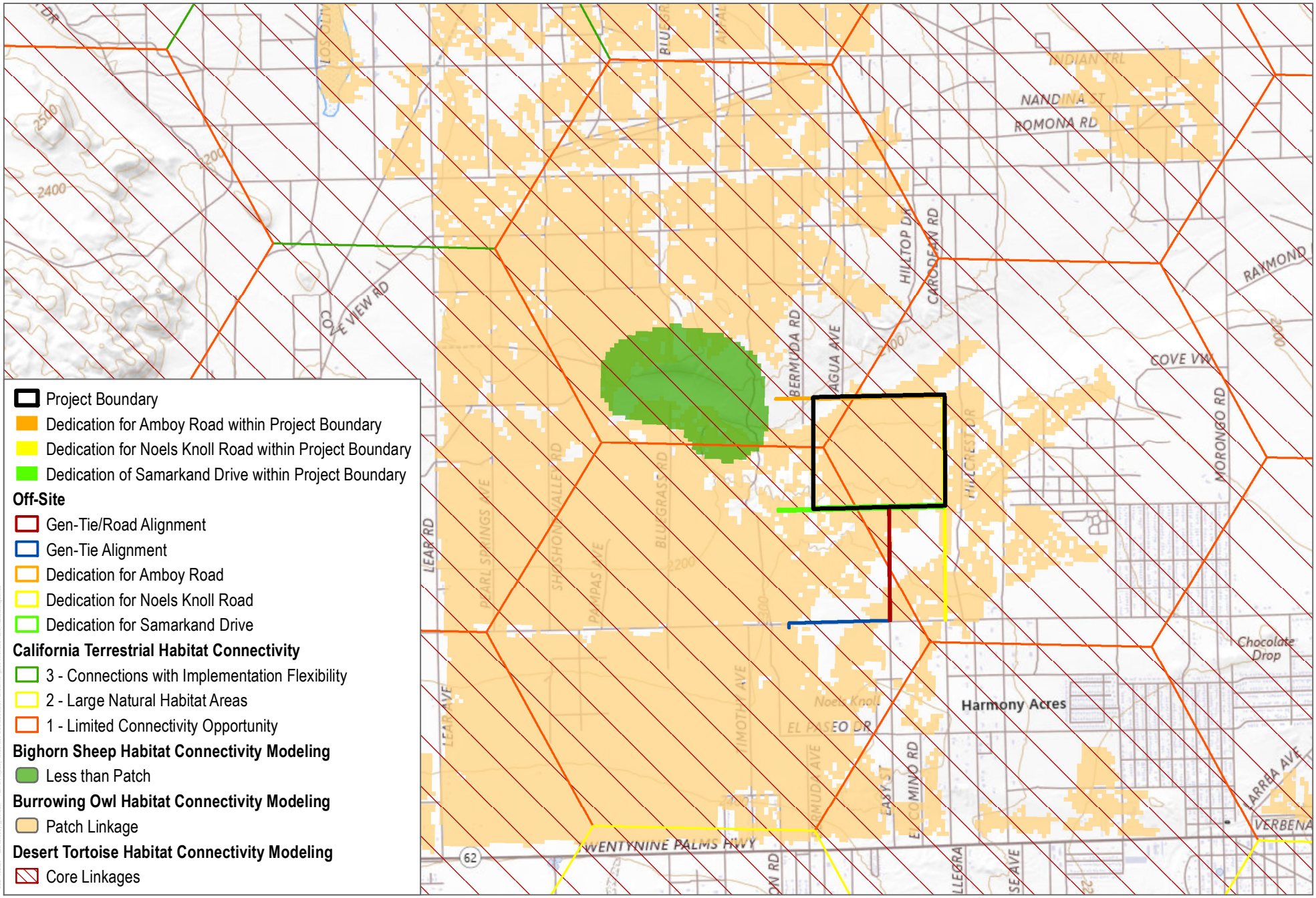
DUDEK

0 500 1,000 Feet

FIGURE 8

Jurisdictional Aquatic Resources

E-Group PS Solar Project Biological Resources Technical Report



SOURCE: CDFW BIOS; USGS National Map

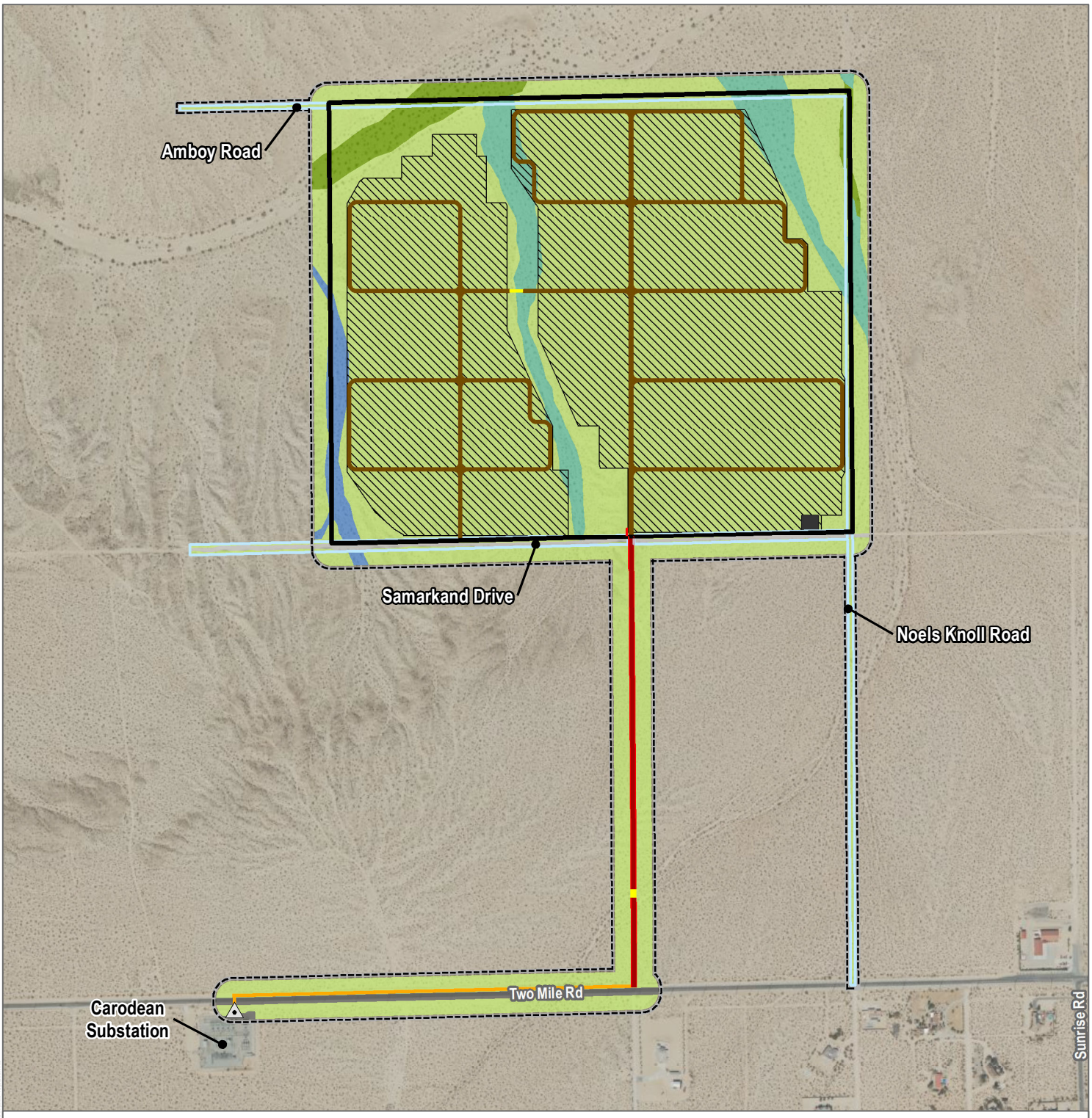
DUDEK

0 0.5 1 Miles

FIGURE 9

Wildlife Corridors and Habitat Linkages

E-Group PS Solar Project Biological Resources Technical Report



Biological Survey Area (BSA)
Project Boundary

Permanent Impacts
Access Road
Gen-Tie/Road Alignment
Road Dedications
PV Installation Area
Substation
Gen-Tie Interconnection Pole Footprint

Temporary Impacts
Gen-Tie Trench Work Area
Gen-Tie Trench Installation

Avoidance
Bridge

Vegetation Communities and Land Covers
Ambrosia salsola - Larrea tridentata
Larrea tridentata - Ambrosia dumosa - Ambrosia salsola
Larrea tridentata - Ambrosia dumosa - Krameria (erecta, grayi)
Psorothamnus spinosus
Disturbed Habitat
Urban/Developed

SOURCE: NEXT Engineering Group; AHZ Consulting Engineering Inc.;County of San Bernardino; Bing Maps

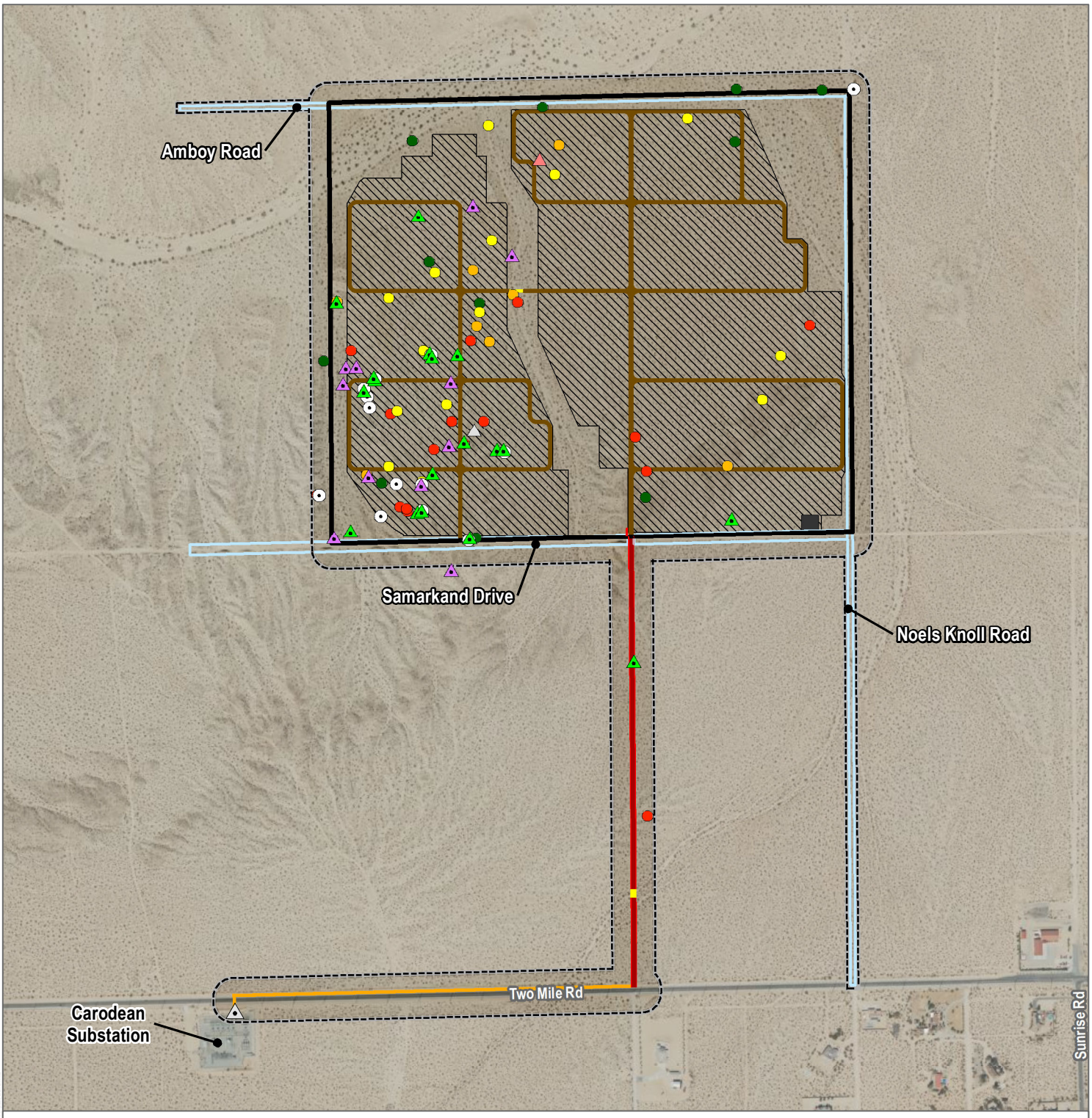
DUDEK

0 500 1,000 Feet

FIGURE 10

Impacts to Vegetation Communities and Land Covers

E-Group PS Solar Project Biological Resources Technical Report



SOURCE: NEXT Engineering Group; AHZ Consulting Engineering Inc.;County of San Bernardino; Bing Maps

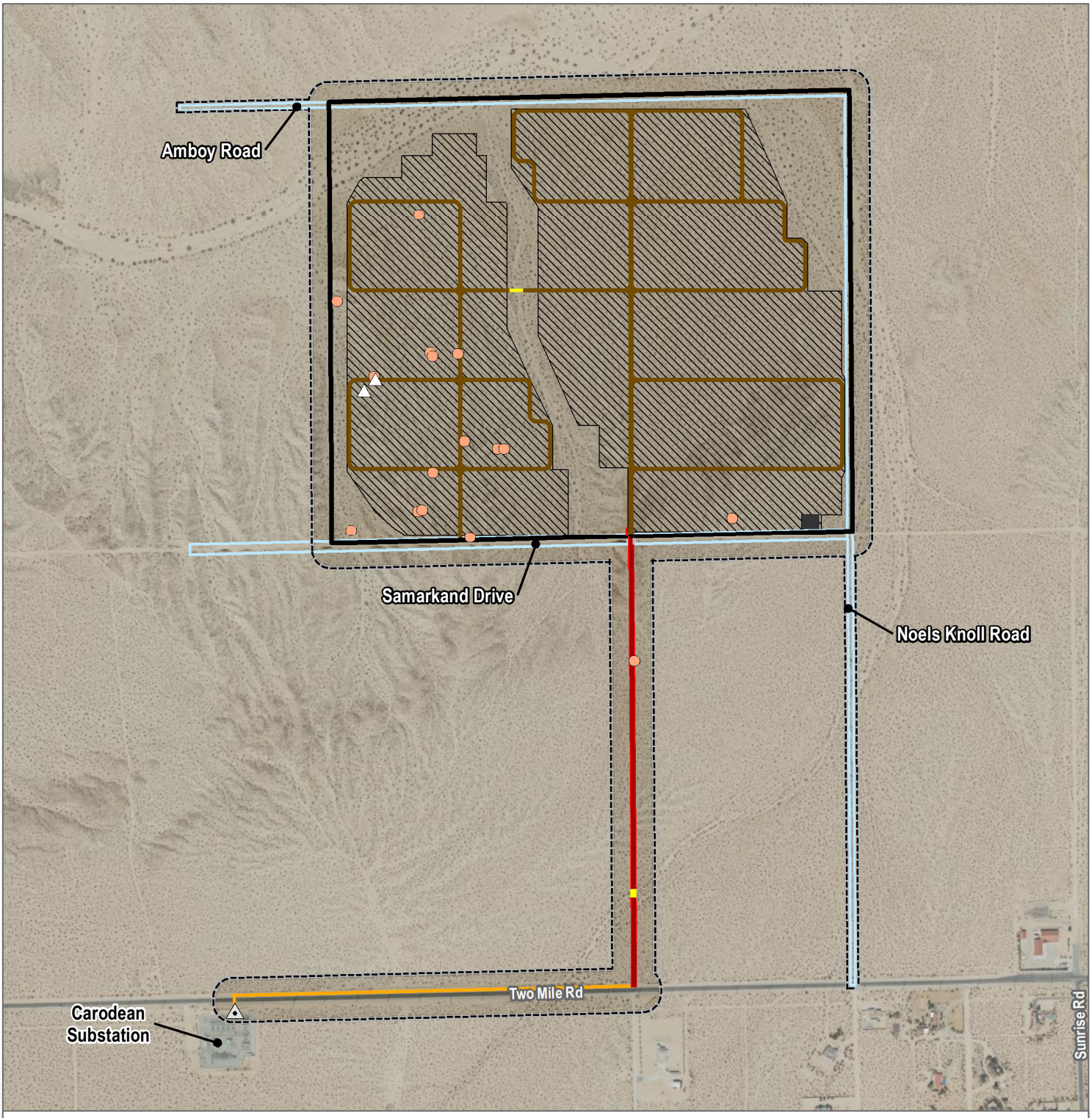
DUDEK

0 500 1,000 Feet

FIGURE 11A

Impacts to Desert Tortoise

E-Group PS Solar Project Biological Resources Technical Report



Biological Survey Area (BSA)
Project Boundary

Permanent Impacts
Access Road
Gen-Tie/Road Alignment
Road Dedications
PV Installation Area
Substation
Gen-Tie Interconnection Pole Footprint

Temporary Impacts
Gen-Tie Trench Work Area
Gen-Tie Trench Installation

Avoidance
Bridge

Protocol Survey Observations
Live Individual

Incidental Observations
Live Individual

SOURCE: NEXT Engineering Group; AHZ Consulting Engineering Inc.;County of San Bernardino; Bing Maps

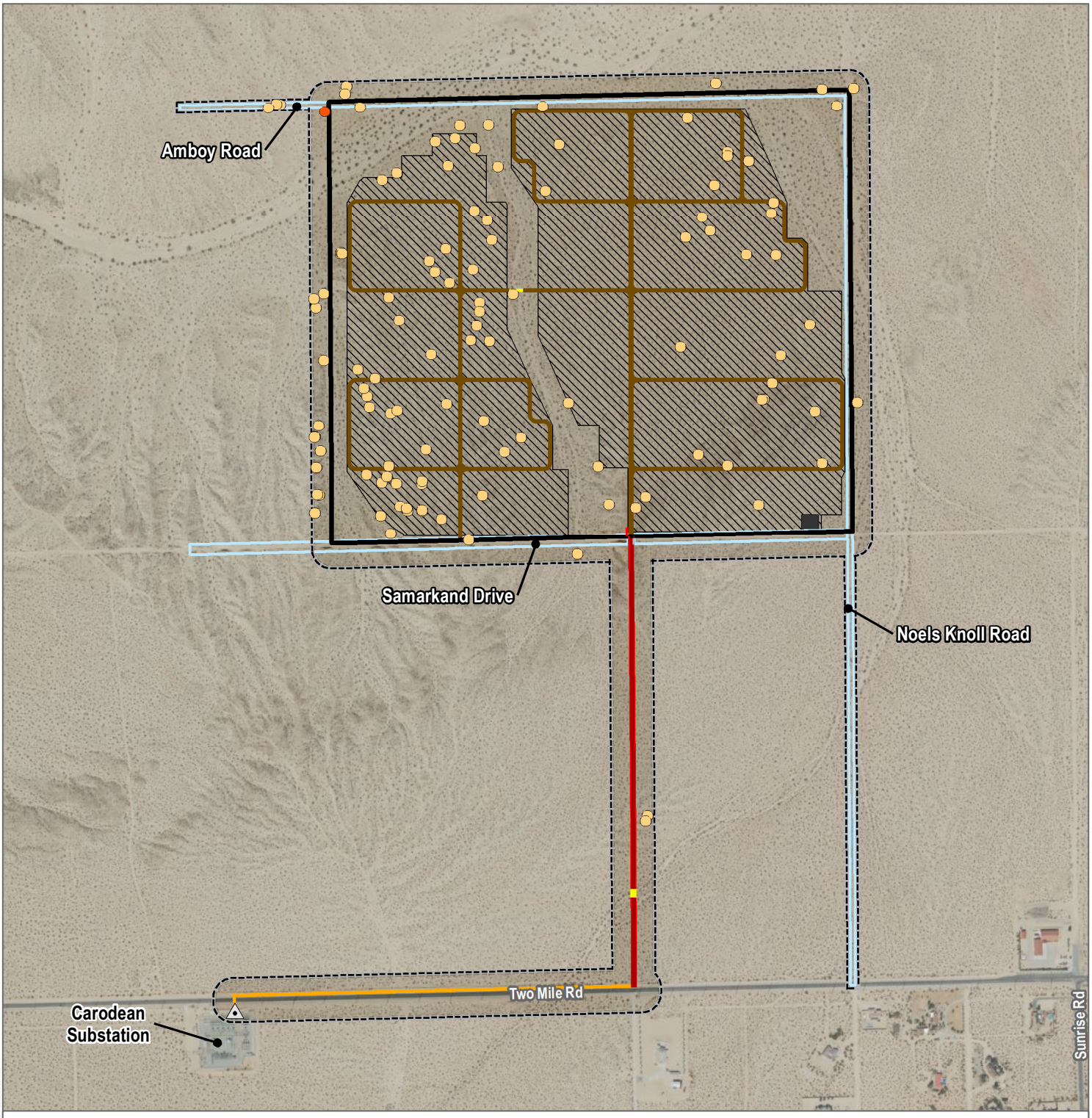
DUDEK

0 500 1,000 Feet

FIGURE 11B

Impacts to Desert Tortoise Live Individuals

E-Group PS Solar Project Biological Resources Technical Report



SOURCE: NEXT Engineering Group; AHZ Consulting Engineering Inc.;County of San Bernardino; Bing Maps

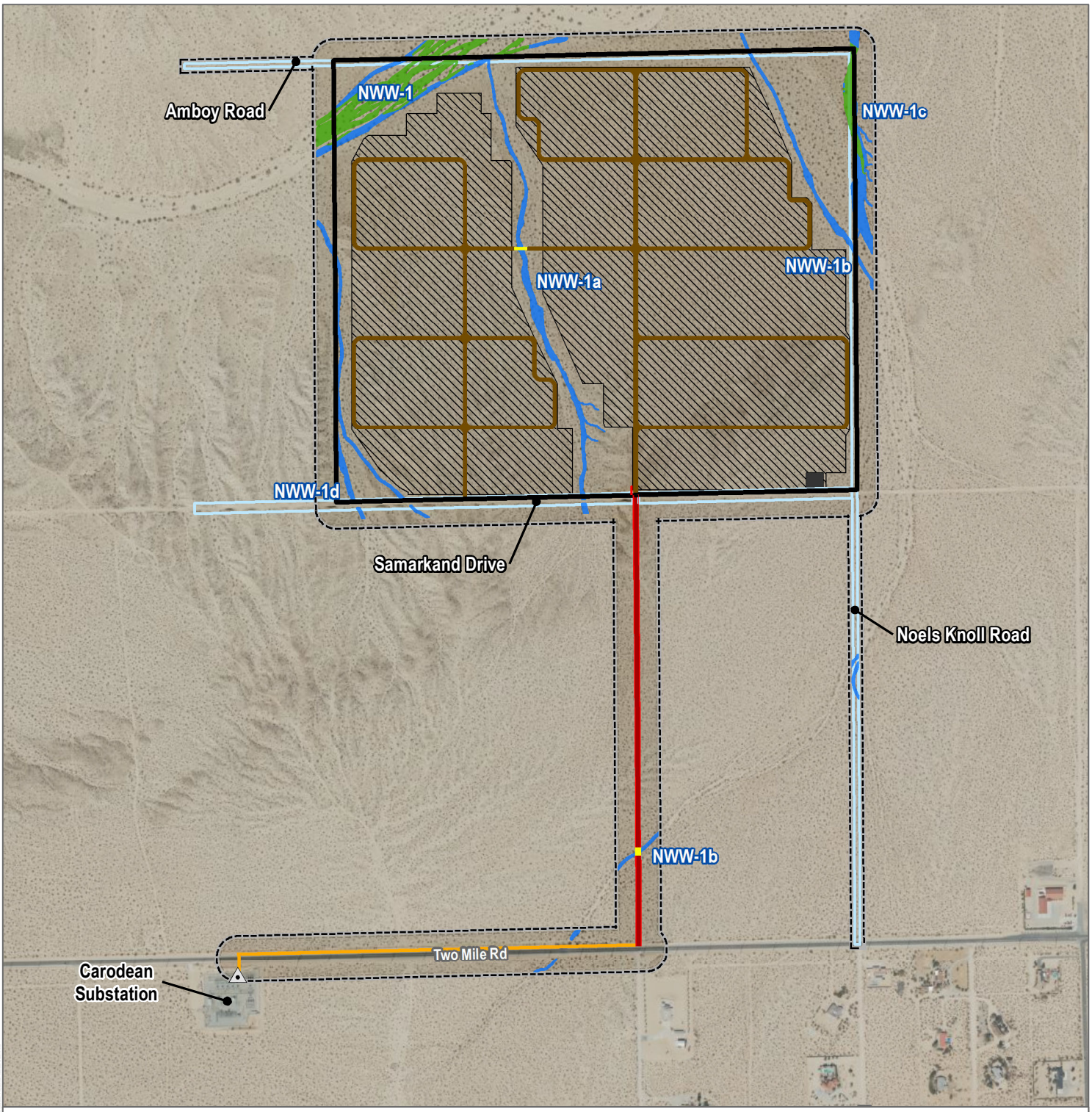
DUDEK

0 500 1,000 Feet

FIGURE 12

Impacts to Burrowing Owl

E-Group PS Solar Project Biological Resources Technical Report



Biological Survey Area (BSA)
Project Boundary

Permanent Impacts
Access Road
Gen-Tie/Road Alignment
Road Dedications
PV Installation Area
Substation
Gen-Tie Interconnection Pole Footprint

Temporary Impacts
Gen-Tie Trench Work Area
Gen-Tie Trench Installation

Avoidance
Bridge

Jurisdictional Aquatic Resources
Non-Wetland Waters/Streambeds
Non-Wetland Waters/Riparian Habitat

SOURCE: NEXT Engineering Group; AHZ Consulting Engineering Inc.,; County of San Bernardino; Open Street Map; Bing Maps

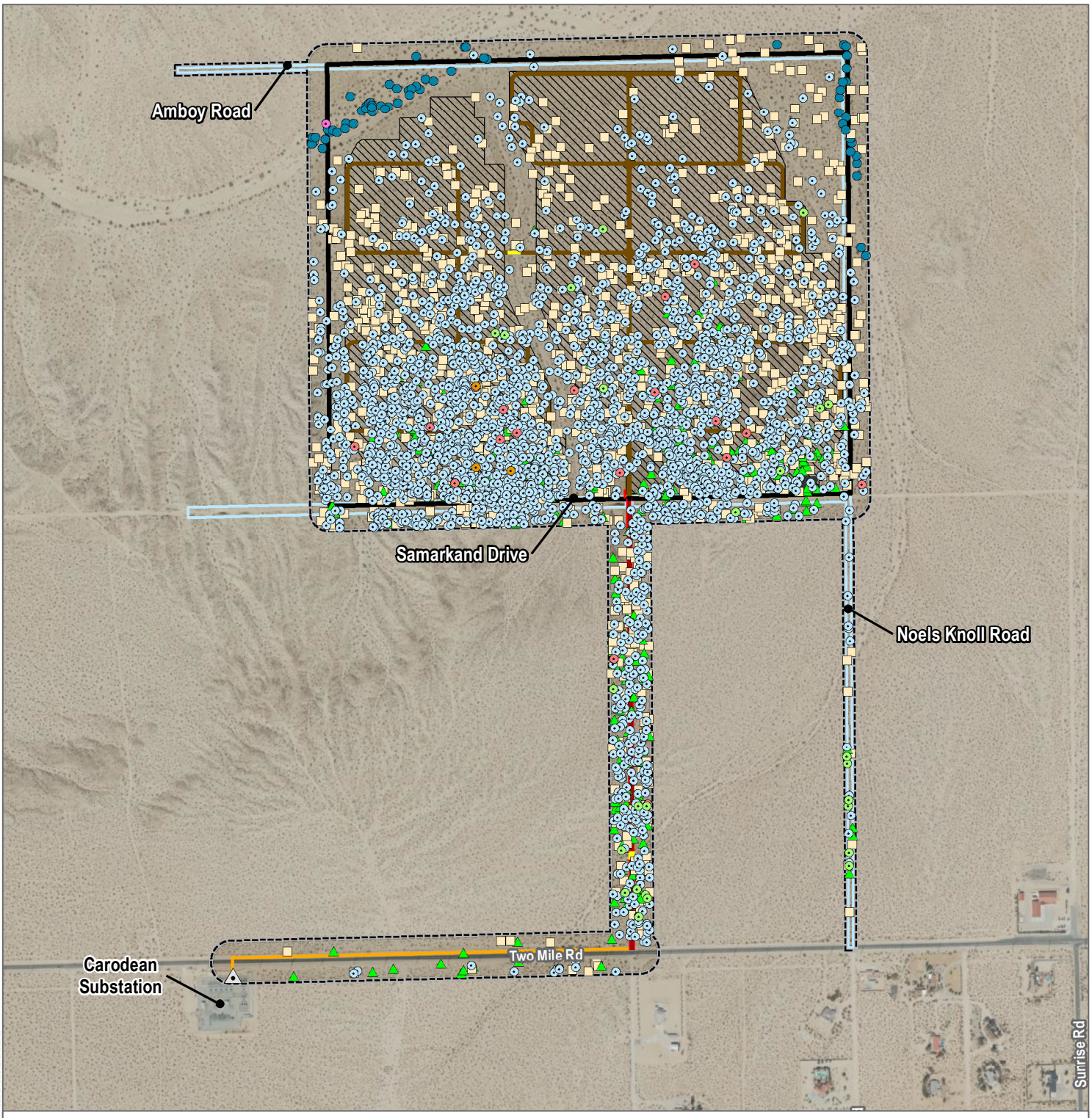
DUDEK

0 500 1,000 Feet

FIGURE 13

Impacts to Jurisdictional Aquatic Resources

E-Group PS Solar Project Biological Resources Technical Report



SOURCE: NEXT Engineering Group; AHZ Consulting Engineering Inc.;County of San Bernardino; Bing Maps

DUDEK

0 500 1,000 Feet

FIGURE 14

Impacts to California Desert Native Plants

E-Group PS Solar Project Biological Resources Technical Report

Appendix B

Aquatic Resources Delineation Report

Aquatic Resources Delineation Report

E-Group PS Solar Project

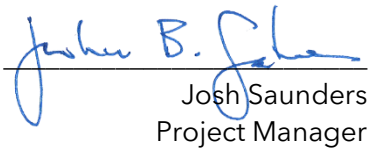
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APPENDICES

A Request for Jurisdictional Determination
B Antecedent Precipitation Tool Output
C Data Forms
D Review Area Photos
E Approved Jurisdictional Determination Form

Acronyms and Abbreviations

Acronym/Abbreviation	Definition
APT	Antecedent Precipitation Tool
ARC	antecedent runoff condition
CDFW	California Department of Fish and Wildlife
NWW	non-wetland water
OHWM	ordinary high-water mark
PDSI	Palmer Drought Severity Index
Project	E-Group PS Solar Project
RWQCB	Regional Water Quality Control Board
USACE	U.S. Army Corps of Engineers
WOTUS	Waters of the United States

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1 Introduction

This Aquatic Resources Delineation Report was prepared in accordance with the Minimum Standards for Acceptance of Aquatic Resources Delineation Reports (USACE 2017). This report and supporting appendices provide the 20 items listed in the Minimum Standards for Acceptance of Aquatic Resources Delineation Reports and presents the results of the jurisdictional aquatic resources delineation conducted by Dudek for the proposed E-Group PS Solar Project (project) in the City of Twentynine Palms, San Bernardino County, California. The delineation was conducted to identify and map existing aquatic resources potentially subject to the regulatory jurisdiction of the U.S. Army Corps of Engineers (USACE) pursuant to Section 404 of the Clean Water Act (33 USC 1344), waters of the state potentially subject to the regulatory jurisdiction of the Regional Water Quality Control Board (RWQCB) pursuant to Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act, and stream and riparian habitats potentially subject to the jurisdiction of the California Department of Fish and Wildlife (CDFW) pursuant to Section 1602 of the California Fish and Game Code (collectively referred to as jurisdictional aquatic resources).

1.1 Disclaimer Statement

This report presents Dudek's best efforts to quantify the extent of jurisdictional aquatic resources potentially regulated by USACE, RWQCB, and CDFW (i.e., regulatory agencies) within the identified review area using the current regulations, written policies, and guidance of these regulatory agencies. The potential jurisdictional resources described in this report are subject to verification by the regulatory agencies. Only the regulatory agencies can make a final determination on whether the features present are subject to USACE, RWQCB, and/or CDFW regulation. A Request for a USACE Jurisdictional Determination is provided in Appendix A.[1]

1.2 Contact Information

Contact information for the project applicant and agent are provided in Table 1.[2] Access to the review area is not restricted, but if a site visit is requested, the project applicant or agent will accompany regulatory staff to the review area.[3] E-Group PS, LLC is the project applicant and lessee of the project area.

Table 1. Contact Information

Project Applicant	E-Group PS, LLC	**Agent**	Dudek
Project Representative	Robert M. Smith	**Agent Representative**	Britney Schultz
Address	925 Fourth Avenue, Suite 2900, Seattle, Washington 98104	**Address**	78075 Main Street, Suite G, La Quinta, California 92253
Phone	206.370.5743	**Phone**	760.601.3416
Email	robert.smith@klgates.com	**Email**	bschultz@dudek.com

1 Minimum Standards Item 1 (Request for Jurisdictional Determination)
2 Minimum Standards Item 2 (Contact Information)
3 Minimum Standards Item 3 (Site Access Statement)

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2 Review Area Description and Landscape Setting[4]

The approximately 241.3-acre review area for the proposed project is within the City of Twentynine Palms, San Bernardino County, California. The review area consists of the project site (Assessor's Parcel Numbers 0612-201-01-0000 and 0612-201-05-0000) plus a 100-foot surrounding buffer, the off-site gen-tie/road alignment from the project site south to Two Mile Road plus a 100-foot surrounding buffer, and road dedication areas (i.e., Amboy Road, Samarkand Drive, and Noels Knoll Road). Note that a portion of Samarkand Drive road dedication is located outside of the review area as depicted on Figure 1 (Project Location). A jurisdictional aquatic resources delineation was not conducted for this area. Should this future road dedication be constructed by the City of Twenty-Nine Palms, a formal jurisdictional aquatic resources delineation shall be conducted and an updated Aquatic Resources Delineation Report shall be prepared in accordance with the Minimum Standards for Acceptance of Aquatic Resources Delineation Reports (USACE 2017).

The review area is on the western side of Twentynine Palms at 34.160458°N and -116.115977°W (Figure 1, Project Location).[5] The review area is within Section 23, Township 1 North, and Range 8 East as depicted on the U.S. Geological Survey Twentynine Palms, California 7.5-minute topographic quadrangle maps (Figure 2, USGS Topographic). Regional access to the review area is provided via California State Route 62, approximately 0.5 miles south of the review area. Directions to the review area are as follows: from Interstate 10 east, take exit 117 onto State Route 62 heading northeast toward Twentynine Palms/Yucca Valley, then turn left onto Sunrise Road. The review area is west of Sunrise Road, north of Two Mile Road, south of Hilltop Drive, and east of Timothy Avenue.

2.1 Topography

Topography within the review area is a gently sloping plane to the north and northeast. Elevation ranges from approximately 2,350 feet above mean sea level in the southern portion of the review area to 2,062 feet above mean sea level in the northern portion of the review area. Adjacent land uses include undeveloped land to the north, south, and west, and residential areas to the east.

2.2 Soils[6]

According to the U.S. Department of Agriculture Natural Resources Conservation Service Web Soil Survey, no existing soil data was available for the review area (USDA 2023a). Soils observed within the review area during the aquatic resources delineation conducted by Dudek were generally sandy/gravelly.

2.3 Vegetation

Six vegetation communities or land cover types were mapped within the review area: creosote bush - white bursage – ratany scrub, creosote bush - white bursage scrub, cheesebush – sweetbush scrub, desert-willow – smoketree

4 Minimum Standards Item 10 (Description of Existing Field Conditions)
5 Minimum Standard Item 14 (Site Location Map)
6 Minimum Standards Item 13 (Soil Descriptions)

wash woodland, urban/developed, and disturbed habitat. The review area is dominated by creosote bush - white bursage scrub, with smaller patches of desert-willow – smoketree wash woodland and cheesebush – sweetbush scrub. A small amount of disturbed habitat is mapped as the portion of Samarkand Drive that overlaps the central portion of the review area and the urban/developed land cover type is mapped as the portion of Two Mile Road that overlaps the southern portion of the review area.

2.4 Watershed

The review area is within the Southern Mojave Subbasin, Hydrologic Unit Code 8 (18100100), and within Indian Cove – Rattlesnake Canyon sub-watershed Hydrologic Unit Code 12 (181001001802) of the Mesquite Lake watershed Hydrologic Unit Code 10 (1810010018) (Figure 3, Hydrologic Setting). The Southern Mojave subbasin comprises approximately 8,867 square miles and spans both San Bernardino and Riverside Counties. The primary geographic and surface hydrologic feature of the watershed is the Mojave River, which flows northeast from the San Bernardino Mountains for approximately 100 miles until it reaches its terminus at Soda Lake near the community of Baker. Some reaches of the Mojave River flow underground in the confined riverbed channel. The Mojave River is approximately 70 miles southeast of the review area. No drainages within the review area flow to the Mojave River. The Mesquite Lake watershed comprises 60 square miles (63,450.75 acres) and is partially within the City of Twentynine Palms in San Bernardino County (USGS 2023).

There are no perennial streams within the Mesquite Lake watershed, and most water features only flow ephemerally in response to storms. Runoff is primarily generated in the surrounding mountains, but is quickly lost as recharge to the mountain front alluvial deposits, leading to very little surface flow leaving this area (Troxell 1954). A substantial amount of runoff that does pass the mountain front area and reaches the basins is then lost to evaporation (Kennedy/Jenks/Todd LLC 2007). The San Bernardino and Little San Bernardino Mountains represent a large surface water divide, with channels on the north and east sides of the ranges tributary to the Great Basin, and channels on the south and west sides tributary to the Pacific Ocean (Troxell 1954). The review area contains several ephemeral drainages that ultimately end in the various playa lakes, meaning that surface water is confined within the basins. In the event of an extraordinary stormflow, water may reach Dale Dry Lake, a dry playa just east of Twentynine Palms (Thompson 1929).

The review area occurs within an alluvial fan, a landform typically associated with episodic sediment transport and deposition within a system of braided channels. Geologic mapping (Dibblee 1968) shows that the review area is underlain by “Older Alluvium” which is an erosion resistant unit exposed in a topographically higher position than the thin, discontinuous veneer of recently transported “Recent Alluvium” deposits observed on aerial photographs as an apparent network of braided channels. However, field surveys found a number of swale features created from sheet flow runoff that lack evidence of sediment deposition, continuous fluvial features such as channel banks, floodplain or bar surfaces, and/or bankfull. Many of these swale features appear on aerial photographs but are actually sandy off-highway vehicle tracks. Therefore, due to the presence of the older alluvium and lack of fluvial indicators, these relic swale features were not mapped as watercourses.

2.5 Review Area Alterations, Current and Past Land Use

The review area is undeveloped open space in Twentynine Palms and has not undergone any major land use changes since the mid-1990s. Active off-road-vehicle use by unknown third parties was observed at the time of the jurisdictional delineation within the ephemeral washes within the review area.

3 Precipitation Data and Analysis[7]

The USACE-developed Antecedent Precipitation Tool (APT) was used to assess whether the delineation date occurred in a drier, average, or wetter than normal period (USACE 2023). To determine what constitutes a "typical year," USACE developed the APT. The information generated from the APT can help to determine whether normal hydrologic and/or climatic conditions were present during the site visit, and assist with completing the Wetland Determination Data Form.

The APT provides three climatological parameters: Palmer Drought Severity Index (PDSI), season, and antecedent precipitation condition. The PDSI is a standardized index calculated on a monthly basis, with PDSI value outputs ranging from -4 (extreme drought) to +4 (very wet) (NOAA 2021) to assess drought conditions (i.e., PDSI Class). The APT determines wet vs. dry season based on related procedures provided in the applicable regional supplement for the review area (in this case, the Arid West Region supplement [USACE 2008a]). If the antecedent runoff condition (ARC) score is less than 10, then the antecedent precipitation condition is classified as drier than normal; normal conditions are present with an ARC score of 10 to 14; conditions are wetter than normal when an ARC score is greater than 14 (USACE 2023).

Table 2 summarizes the key data extrapolated from the APT output: estimated drought conditions (PDSI Class), wet or dry season determination, ARC score, and antecedent precipitation condition. Based on the APT output provided in Appendix B and summarized in Table 2, the precipitation and climatic conditions for the review area were within the normal range during the time of the delineation.

Table 2. Antecedent Precipitation Tool Data for the Review Area

Main Field Survey Date[1]	PDSI Class	Season	ARC Score	Antecedent Precipitation Condition
04/28/2023	Moderate wetness	Dry Season	14	Normal
08/09/2023	Moderate wetness	Dry Season	12	Normal

Notes: PDSI = Palmer Drought Severity Index; ARC = antecedent runoff condition; APT = Antecedent Precipitation Tool.

1 Only data collection occurred during the June 17, 2024 survey; no additional mapping of aquatic resources occurred during this survey. Therefore, APT output is not provided in Table 2.

Additionally, according to the U.S. Department of Agriculture's Agricultural Applied Climate Information System (USDA 2023b), the area around the review area receives an average of 4.72 inches of precipitation annually.

7 Minimum Standards Item 11 (Discussion of Hydrology)

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4 Investigation Methods[8]

The jurisdictional delineation was conducted by Dudek biologists Katie Dayton and Zarina Pringle on April 28, 2023 and by Dudek biologists Britney Schultz, Sarah Greely, and Luz Badillo on August 9, 2023 (Table 3). An additional survey occurred in June 2024 for data collection purposes. Prior to conducting the jurisdictional delineation, U.S. Fish and Wildlife Service's National Wetland Inventory data (USFWS 2023) was reviewed to determine if the review area contained any features mapped by the U.S. Fish and Wildlife Service. Site-specific topographical data was reviewed in conjunction with aerials, both current and historical, to determine the potential presence of non-wetland waters. Current vegetation mapping was reviewed to assess whether the review area supported hydrophytic vegetation and potential wetlands. No areas within the review area supported hydrophytic vegetation, and therefore wetland data station forms were not completed. Jurisdictional boundaries were mapped in the field using ESRI Collector on a mobile device with submeter accuracy. Remote sensing was not used for the delineation.

Table 3. Schedule of the Aquatic Resources Delineation

Date	Hours	Personnel	Conditions
04/28/2023	6:57 a.m.– 2:50 p.m.	Katie Dayton, Zarina Pringle	68–92°F; 0% cloud cover; 0–4 mph wind
08/09/2023	6:05 a.m.– 11:55 a.m.	Britney Schultz, Sarah Greely, Luz Badillo	79–95°F; 10-60% cloud cover; 0–1 mph wind
06/17/2024	8:38 a.m.–3:21 p.m.	Britney Schultz, Callie Amoaku	81°F–98°F; 0% cloud cover; 0–9 mph wind

Notes: F = Fahrenheit; mph = miles per hour. Only data collection occurred during the June 17, 2024, survey; no additional mapping of aquatic resources occurred during this survey.

4.1 U.S. Army Corps of Engineers

The USACE wetlands delineation was conducted in accordance with the 1987 USACE Wetlands Delineation Manual (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008a). A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States: A Delineation Manual (USACE 2008b) was used to determine the limits of non-wetland waters. Non-wetland waters were delineated on topographical maps in conjunction with ESRI Collector on a mobile device. The widths of each non-wetland water were determined in the field according to the OHWM manual.

Due to the absence of hydrophytic vegetation, Wetland Determination Forms were not taken. USACE OHWM Forms were completed at representative cross-sections of non-wetland waters to capture their characteristics and widths. In addition, each of the potential non-wetland waters within the review area was evaluated to determine that all features are ephemeral using the Beta Streamflow Duration Assessment Method for the Arid West (SDAM) (Mazor et al. 2023) and the Mapping Episodic Stream Activity (MESA) guidelines (Brady 2013). All data forms can be found in Appendix C. Representative photos are included in Appendix D.

[8] Minimum Standards Item 8 (Dates of Field Work), Item 5 (Use of 1987 Manual, Regional Supplement, and OHWM guide), Item 12 (Statement Regarding Use of Remote Sensing), Item 18 (Data Forms) and Item 19 (Methods)

4.2 Regional Water Quality Control Board

Waters of the state regulated by the RWQCB were mapped in accordance with the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (SWRCB 2021). As described in these procedures, wetland waters of the state are mapped based on the procedures in USACE's 1987 Corps of Engineers Wetlands Delineation Manual (USACE 1987) and its 2008 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (USACE 2008a). Non-wetland waters are mapped at the OHWM based on the procedures defined in USACE's A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States: A Delineation Manual (USACE 2008b).

4.3 California Department of Fish and Wildlife

CDFW jurisdictional areas were mapped to include the bank of the stream/channel and outer dripline of adjacent riparian vegetation, as set forth under California Fish and Game Code Section 1602. Streambeds under the jurisdiction of CDFW were delineated using the Cowardin method of waters classification, which defines waters boundaries by a single parameter (i.e., hydric soils, hydrophytic vegetation, or hydrology) (Cowardin et al. 1979). Each of the potential non-wetland waters within the review area was evaluated using the MESA guidelines (Brady 2013) and the data forms can be found in Appendix C. CDFW also regulates riparian vegetation communities that occur beyond the limits of regulated streambeds.

5 Aquatic Resource Narrative[9]

5.1 Waters of the United States (USACE)

The Supreme Court recently clarified what waters are considered "Waters of the United States" (WOTUS) under the Clean Water Act. In *Sackett v. EPA*, the Supreme Court held that WOTUS refers only to "those relatively permanent, standing or continuously flowing bodies of water forming geographic[al] features that are described in ordinary parlance as streams, oceans, rivers, and lakes."[10] In determining wetlands subject to Clean Water Act jurisdiction, the majority opinion presents a two-step process under which federal jurisdiction may be asserted over a wetland. The agency must establish "first, that the adjacent [body of water constitutes] … 'water[s] of the United States' (i.e., a relatively permanent body of water connected to traditional interstate navigable waters); and second, that the wetland has a continuous surface connection with that water, making it difficult to determine where the 'water' ends and the 'wetland' begins."[11] While the USACE is in the process of updating its regulations and its definition of WOTUS to be consistent with this decision, the Supreme Court's guidance is used here to determine federal jurisdictional waters.

There are no non-wetland waters (NWW), culverts, or wetlands potentially regulated by USACE present in the review area (Figure 4, Potential Jurisdictional Aquatic Resources – USACE).[12] A copy of the ORM Bulk Upload Aquatic Resources or Consolidated Excel spreadsheet is not submitted with this report because Table 4 in this chapter provides all the information requested.[13]

The non-wetland waters in the review area are presumed to be non-jurisdictional by USACE because they are ephemeral and not relatively permanent, standing, or continuously flowing bodies of water. Further, they are isolated features with no downstream connection to traditional interstate navigable waters. Each of these features dissipates into the landscape at or before they reach Mesquite Lake to the northeast, a dry lake playa which is not considered a traditional navigable water. Mesquite Lake is an enclosed basin with no outlet, and has previously been determined by USACE to be an isolated (non-federal) water (SPL201200589; see Appendix E, Approved Jurisdictional Determination Form).

NWW 1 through NWW-1d are similar; all are natural, ephemeral drainages, between approximately 9 to 58 feet wide at their OHWM.

Non-Wetland Water 1

NWW-1 is a feature recorded on Transect OHWM 6 (OHWM-T-6) during the April 28, 2023, site visit and is in the northwest corner of the review area. Transects SDAM-T-02 and MESA-T-02 were also taken within this feature. NWW-1 ranges from approximately 4 feet to approximately 50 feet wide. The drainage is an ephemeral desert feature with no wetland vegetation cover. A cross-section of NWW-1 shows the following OHWM indicators: change in average sediment texture, change in vegetation cover, and break in bank slope. NWW-1a through NWW-1c are tributaries of NWW-1 that flow north to northwest within the review area before joining NWW-1. NWW-1 enters in

9 Minimum Standards Item 6 (Aquatic Resource Narrative)
10 *Sackett v. Env't Prot. Agency*, No. 21-454, 2023 WL 3632751, at *2 (U.S. May 25, 2023)
11 *Id*. at *3 (quoting *Rapanos, v. United States*, 547 U.S. 715, 755 (2006)).
12 Minimum Standards Items 7 and 16 (Delineation Maps)
13 Minimum Standards Item 15 (ORM Bulk Upload Aquatic Resources or Consolidated Excel spreadsheet)

the northwest corner of the review area and flows northeast where it dissipates south of Mesquite Lake. This ephemeral feature does not drain to a WOTUS, and is presumed to be non-jurisdictional by USACE.

Non-Wetland Water 1a

NWW-1a is a feature recorded on OHWM Transect 3 (OHWM-T-3) during the April 28, 2023, site visit and is in the western half of the review area. Transects SDAM-T-03 and MESA-T-03 were also taken within this feature. NWW-1a is 19 feet wide at its OHWM. The drainage is an ephemeral drainage feature with a small amount of upland species shrub cover. NWW-1a flows northwest and joins NWW-1, a larger feature. A cross-section of NWW-1a shows the following OHWM indicators: change in average sediment texture, change in vegetation cover, break in bank slope, sediment sorting, scour, and inconsistent bed and bank definition. This feature flows north to join with NWW-1, which flows northeast to where it dissipates south of Mesquite Lake. This ephemeral feature does not drain to a WOTUS, and is presumed to be non-jurisdictional by USACE.

Non-Wetland Water 1b

NWW-1b is a feature recorded on OHWM Transect 1 (OHWM-T-1) during the April 28, 2023, site visit within the northeast portion of the review area, and recorded on OHWM Transect 10 (OHWM-T-10) during the August 9, 2023, site visit within the southern portion of the review along the gen-tie/road alignment. Transects SDAM-T-04 and MESA-T-05 were also taken within this feature. NWW-1b is 9 to 10 feet wide at its OHWM. The drainage is an ephemeral feature with no wetland vegetation cover. A cross-section of NWW-1b shows the following OHWM indicators: change in average sediment texture, change in vegetation cover, and break in bank slope. NWW-1b flows north to join with NWW-1, which flows northeast to where it dissipates south of Mesquite Lake. This ephemeral feature does not drain to a WOTUS, and is presumed to be non-jurisdictional by USACE.

Non-Wetland Water 1c

NWW-1c is a feature recorded on OHWM Transect 2 (OHWM-T-2) during the April 28, 2023, site visit and is within the far northeast portion of the review area. NWW-1c is 59 feet wide at its OHWM. The drainage is an ephemeral feature with a small amount of upland species shrub and herbaceous cover. A cross-section of NWW-1b shows the following OHWM indicators: change in average sediment texture, change in vegetation cover, break in bank slope, sediment sorting, and scour. NWW-1b flows north to join with NWW-1, which flows northeast to where it dissipates south of Mesquite Lake. This ephemeral feature does not drain to a WOTUS, and is presumed to be non-jurisdictional by USACE.

Non-Wetland Water 1d

NWW-1d is a feature recorded on OHWM Transect 9 (OHWM-T-9) during the August 9, 2023, site visit and is within the western portion of the review area. Transects SDAM-T-01 and MESA-T-01 were also taken within this feature. NWW-1d is 32 feet wide at its OHWM. The drainage is an ephemeral feature with a small amount of upland species shrub and herbaceous cover. A cross-section of NWW-1d shows the following OHWM indicators: change in average sediment texture, change in vegetation cover, break in bank slope, deposition, and wracking. NWW-1d flows north to join with NWW-1, which flows northeast to where it dissipates south of Mesquite Lake. This ephemeral feature does not drain to a WOTUS, and is presumed to be non-jurisdictional by USACE.

Table 4. Potential USACE Aquatic Resource Summary for the Review Area[14]

Feature Name	Cowardin[1]	OHWM Indicators	Stream Order[2]	Location (Latitude/ Longitude; Decimal Degrees)	Acres/ Linear Feet[3]
Non-Wetland Waters					
NWW-1	R6	CAST, CVC, BBS	1st	34.164207, -116.119126	3.24/6,820
NWW-1a	R6	CAST, CVC, BBS, SS, S, BB	1st	34.160442, -116.117752	1.18/3,181
NWW-1b	R6	CAST, CVC BBS, SS, S	1st	34.162596, -116.113601	0.72/2,141
NWW-1c	R6	CAST, CVC, BBS, SS, S	1st	34.161645, -116.111256	1.52/2,047
NWW-1d	R6	CAST, CVC, BBS, D, W	1st	34.159391, -116.121441	0.74/2,614
				Grand Total	**7.39/16,804**

Notes: OHWM = ordinary high-water mark; NWW = non-wetland water; R6 = Riverine, ephemeral; CAST = change in average sediment texture; BBS = break in bank slope; CVC = change in vegetation cover; BB = bed and bank; D = deposition; SS = sediment sorting; S = scour; W = wracking

1 Pursuant to Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979) and USACE Cowardin Codes for ORM Data Entry (USACE 2022).

2 Stream order for each feature is based on Strahler 1957.

3 Totals may not sum due to rounding.

5.2 Waters of the State (RWQCB)

The jurisdiction of the RWQCB under Section 401 of the Clean Water Act is based upon a nexus with a federal permitting or action.[15] As discussed above, none of the waters identified within the project area qualify as WOTUS and the project will therefore likely not require a permit from USACE or any other federal agency. However, the RWQCB retains jurisdiction over the project if any of the waters would be considered Waters of the State under the Porter-Cologne Water Quality Control Act. "Waters of the State" are defined broadly to include "any surface water or groundwater . . . within the boundaries of the state."[16]

There are five features subject to regulation by the RWQCB under the Porter-Cologne Water Quality Control Act (Figure 5, Potential Jurisdictional Aquatic Resources – RWQCB/CDFW). Table 5 lists all features within the review area that are subject to RWQCB regulation.

Table 5. RWQCB Aquatic Resource Summary for the Review Area

Feature Name	Location (Latitude/Longitude; Decimal Degrees)	Acreage/Linear Feet[1]
Non-Wetland Waters		
NWW-1	34.164207, -116.119126	3.24/6,820
NWW-1a	34.160442 -116.117752	1.18/3,181
NWW-1b	34.162596, -116.113601	0.72/2,141
NWW-1c	34.161645, -116.111256	1.52/2,047

14 Minimum Standards Item 9 (Table Listing All Aquatic Resources)

15 33 U.S.C. § 1341.

16 Cal. Water Code § 13050(e).

Table 5. RWQCB Aquatic Resource Summary for the Review Area

Feature Name	Location (Latitude/Longitude; Decimal Degrees)	Acreage/Linear Feet[1]
Non-Wetland Waters		
NWW-1d	34.159391, -116.121441	0.74/2,614
	Grand Total	**7.39/16,804**

Notes: RWQCB = Regional Water Quality Control Board; NWW = non-wetland water.
[1] Totals may not sum due to rounding.

5.3 CDFW Jurisdiction

The features described above in the USACE and RWQCB resource sections were also evaluated as potential CDFW aquatic resources. There are five features subject to regulation by CDFW (Figure 5). Areas of streambeds that overlap the desert-willow – smoketree wash woodland vegetation community were classified as CDFW riparian habitat. Table 6 lists all features within the review area that are subject to CDFW regulation.

Table 6. CDFW Aquatic Resource Summary for the Review Area

Feature Name	Location (Latitude/Longitude; Decimal Degrees)	Acreage [1]
Streambed		
NWW-1	34.164207, -116.119126	0.91
NWW-1a	34.160442 -116.117752	1.18
NWW-1b	34.162596, -116.113601	0.72
NWW-1c	34.161645, -116.111256	0.80
NWW-1d	34.159391, -116.121441	0.74
	Streambed Subtotal	*4.35*
Riparian Habitat (Desert-Willow – Smoketree Wash Woodland)		
NWW-1	34.164207, -116.119126	2.33
NWW-1c	34.163471, -116.111509	0.71
	Riparian Habitat Subtotal	*3.04*
	Grand Total	**7.39**

Notes: CDFW = California Department of Fish and Wildlife; NWW = non-wetland water.
[1] Totals may not sum due to rounding.

5.4 National Wetlands Inventory

The review area has four mapped resources from the U.S. Fish and Wildlife Service's National Wetlands Inventory (USFWS 2023; see Figure 3). Riverine (R4SBJ per Cowardin classification) habitat is mapped overlapping NWW-1, NWW-1a, NWW-1b, NWW-1c, and NWW-1d. These connecting features continue generally northeast of the review area, but terminate before entering a waterbody.

6 Results and Conclusions

Based on the jurisdictional delineation and review of relevant information provided in this Aquatic Resources Delineation Report, no features within the review area are regulated by USACE given (1) that they are ephemeral and temporary in nature and are not permanent, standing, or continuously flowing bodies of water, and (2) their lack of downstream connection to a traditional navigable waters. These features are still likely regulated by the RWQCB and CDFW pursuant to state regulations. In total, 7.39 acres of non-wetland waters under RWQCB jurisdiction, and 4.35 acres of CDFW streambed and 3.04 acres of CDFW riparian occur in the review area. As stated in Section 1.1 above, only the regulatory agencies can make a final determination on whether the features present are subject to USACE, RWQCB, and/or CDFW regulation.

As previously stated, within the review area there are a number of swale features evident on aerial photography, which are actually sandy off-highway vehicle tracks that lack evidence of sediment deposition, continuous fluvial features such as channel banks, floodplain or bar surfaces, and/or bankfull. Therefore, due to the presence of the older alluvium geologic mapping and lack of fluvial indicators, these relic swale features were not mapped as a jurisdictional aquatic resource.

As stated in Section 2 above, a portion of Samarkand Drive road dedication is located outside of the review area as depicted on Figures 1-5. A jurisdictional aquatic resources delineation was not conducted for this area. Should this future road dedication be constructed by the City of Twenty-Nine Palms, a formal jurisdictional aquatic resources delineation shall be conducted, and an updated Aquatic Resources Delineation Report shall be prepared in accordance with the Minimum Standards for Acceptance of Aquatic Resources Delineation Reports (USACE 2017).

This report can be used by those agencies to determine if they would regulate the features described herein. The GIS data for the delineation is provided digitally.[17]

[17] Minimum Standards Item 20 (Digital Data)

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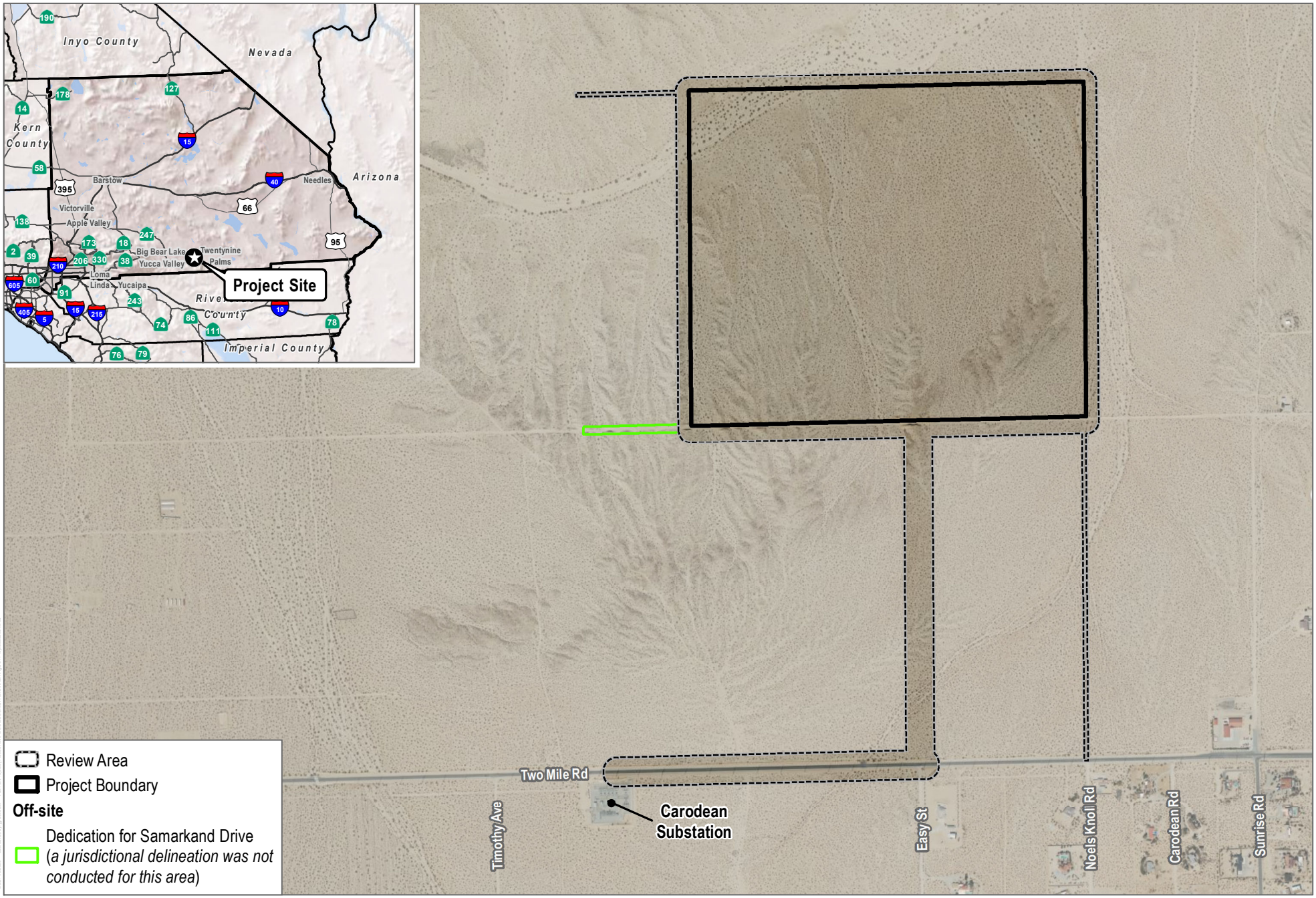
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SOURCE: NEXT Engineering Group, 2024; County of San Bernardino; Open Street Map; Bing Maps

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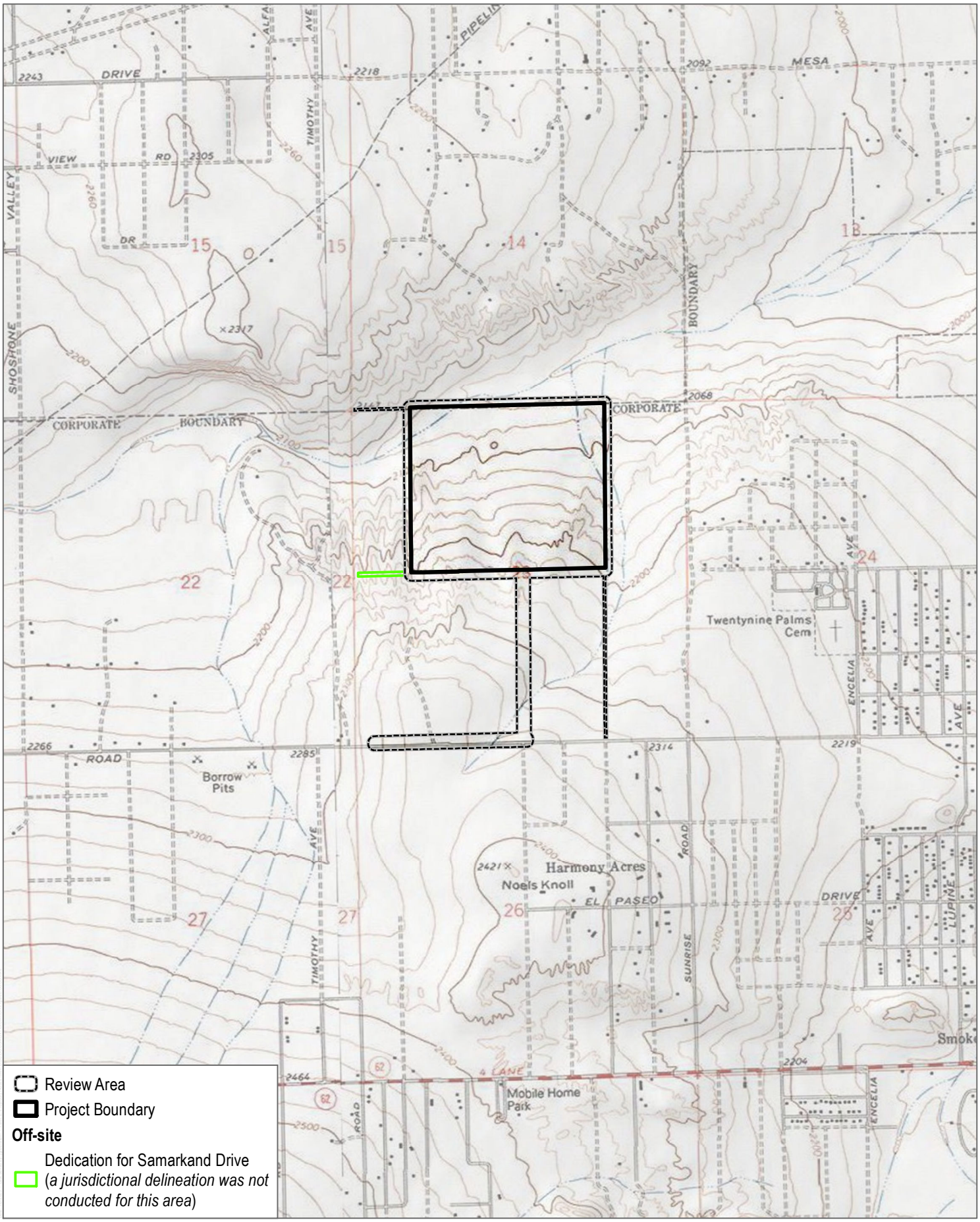
0 500 1,000 Feet

FIGURE 1

Project Location

Aquatic Resources Delineation Report for the E-Group PS Solar Project

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SOURCE: USGS 7.5-Minute Series Twentynine Palms Quadrangle

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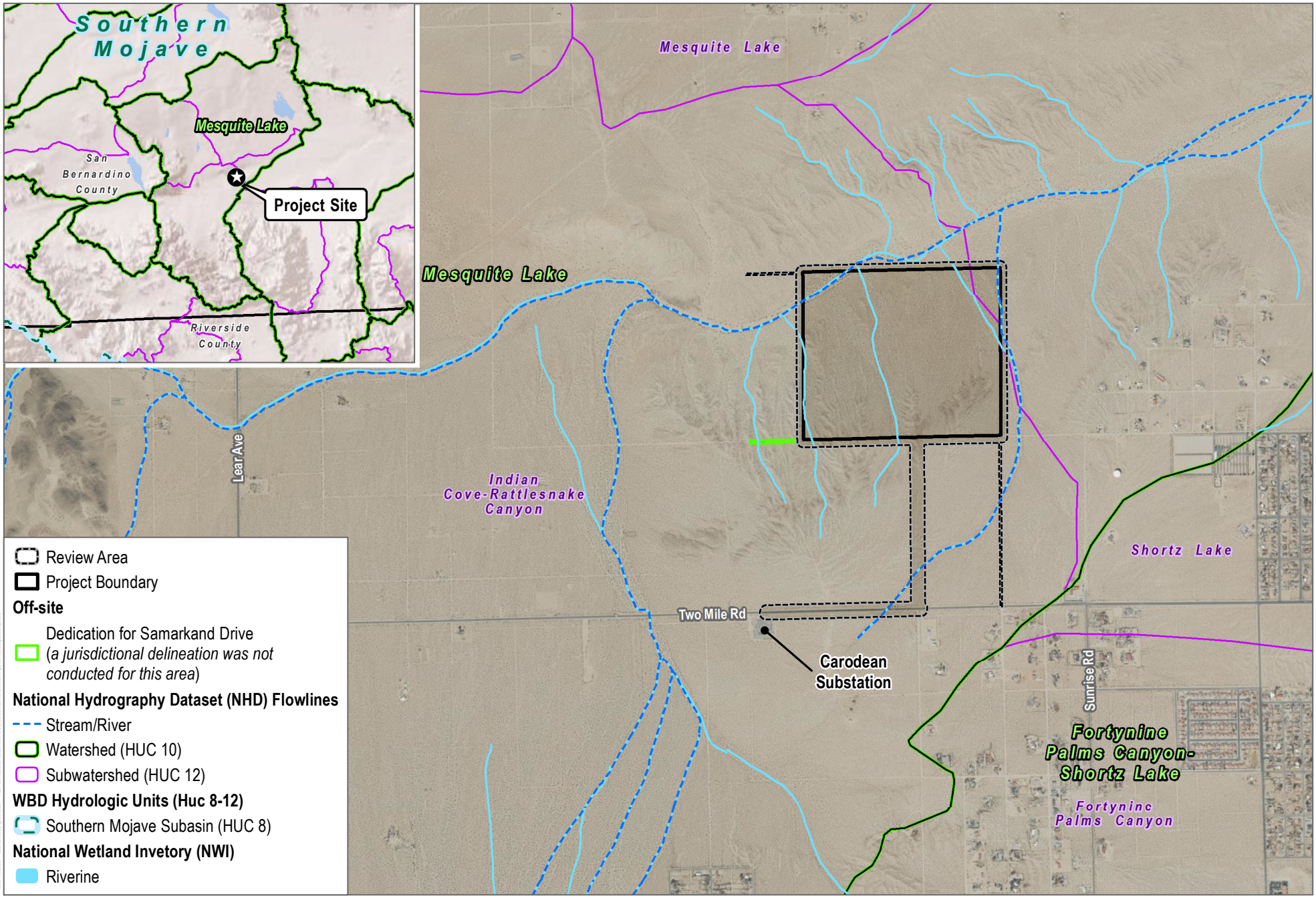
0 1,000 2,000 Feet

FIGURE 2

USGS Topographic

Aquatic Resources Delineation Report for the E-Group PS Solar Project

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SOURCE: USFWS NWI; USGS NHD; County of San Bernardino; Open Street Map; Bing Maps

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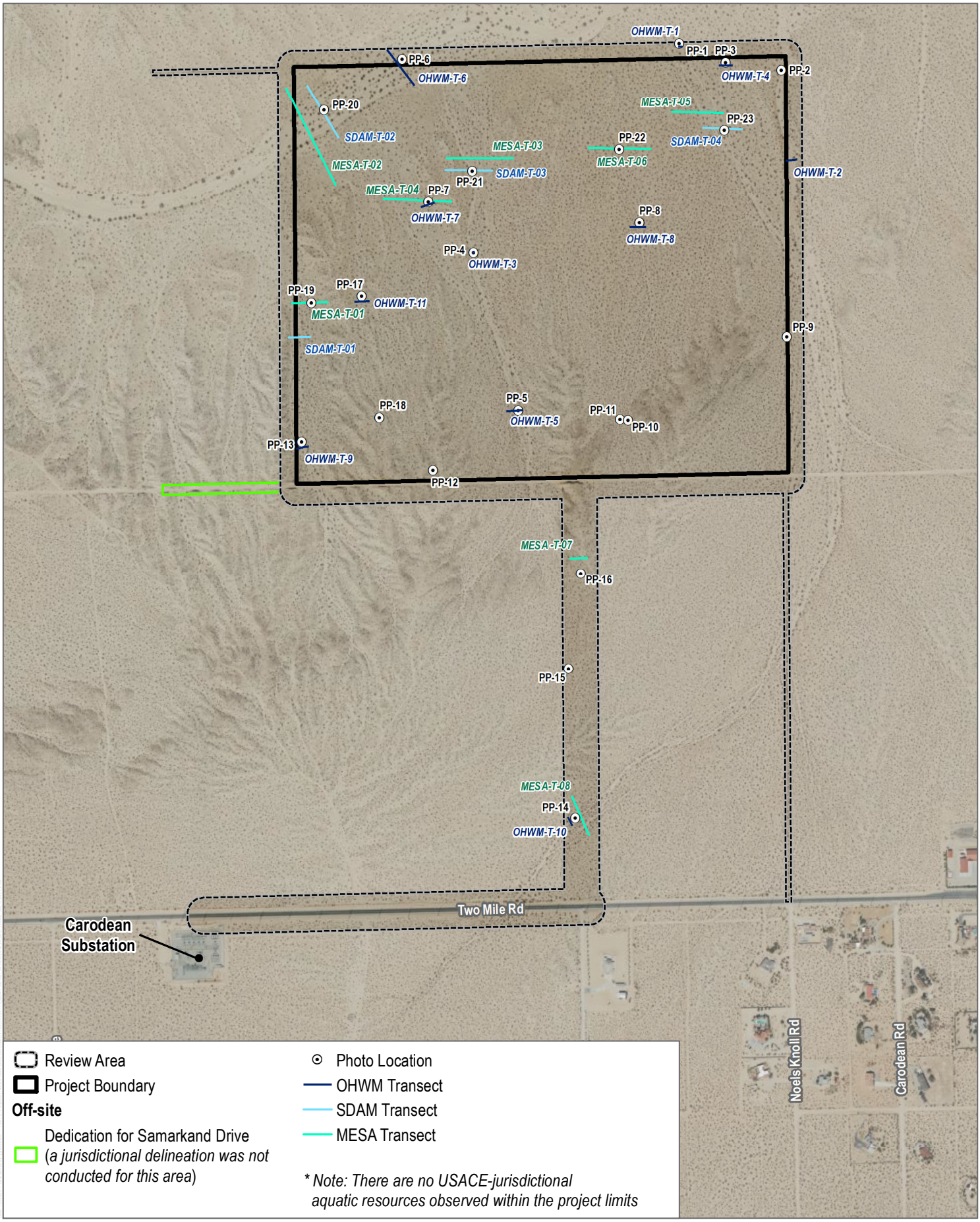
0 1,000 2,000 Feet

FIGURE 3

Hydrologic Setting

Aquatic Resources Delineation Report for the E-Group PS Solar Project

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SOURCE: County of San Bernardino; Open Street Map; Bing Maps

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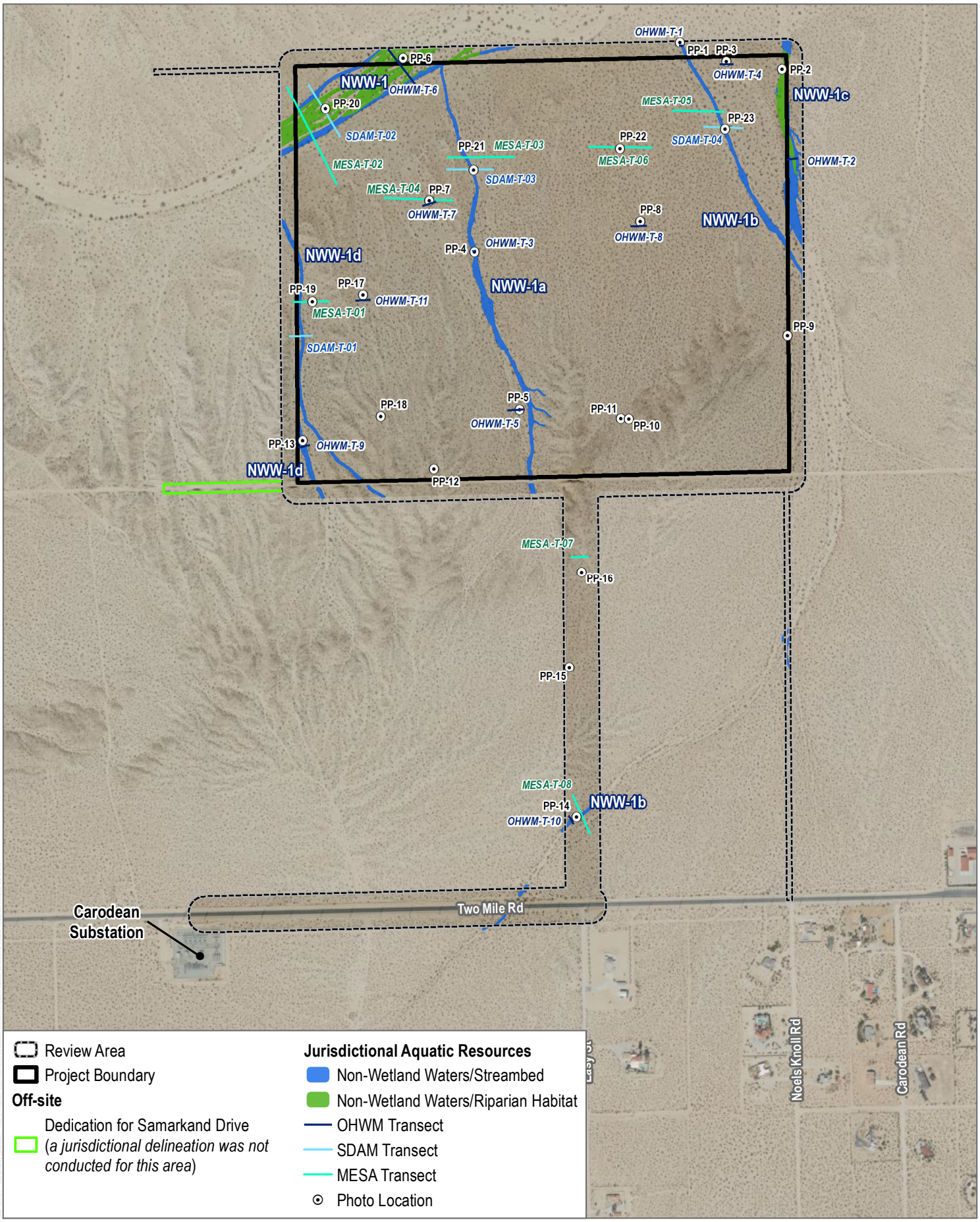
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FIGURE 4

Potential Jurisdictional Aquatic Resources - USACE

Aquatic Resources Delineation Report for the E-Group PS Solar Project

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SOURCE: County of San Bernardino; Open Street Map; Bing Maps

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0 500 1,000 Feet

FIGURE 5

Potential Jurisdictional Aquatic Resources - RWQCB/CDFW

Aquatic Resources Delineation Report for the E-Group PS Solar Project

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Appendix A

Request for Jurisdictional Determination

Appendix 1 - REQUEST FOR CORPS JURISDICTIONAL DETERMINATION (JD)

To: District Name Here

- I am requesting a JD on property located at: West of Sunrise Road, north of 2 Mile Road, south of Hilltop Drive, and east of Timothy Avenue
  (Street Address)
  City/Township/Parish: Twentynine Palms County: San Bernardino State: CA
  Acreage of Parcel/Review Area for JD: 161.4
  Section: 14, 23 Township: 1N Range: 8E
  Latitude (decimal degrees): 34.160556 Longitude (decimal degrees): -116.115278
  (For linear projects, please include the center point of the proposed alignment.)
- Please attach a survey/plat map and vicinity map identifying location and review area for the JD.
- ☐ I currently own this property. ☐ I plan to purchase this property.
  ☑ I am an agent/consultant acting on behalf of the requestor.
  ☐ Other (please explain): _____.
- Reason for request: (check as many as applicable)
  ☐ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all aquatic resources.
  ☐ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all jurisdictional aquatic resources under Corps authority.
  ☑ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps, and the JD would be used to avoid and minimize impacts to jurisdictional aquatic resources and as an initial step in a future permitting process.
  ☐ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps; this request is accompanied by my permit application and the JD is to be used in the permitting process.
  ☐ I intend to construct/develop a project or perform activities in a navigable water of the U.S. which is included on the district Section 10 list and/or is subject to the ebb and flow of the tide.
  ☐ A Corps JD is required in order to obtain my local/state authorization.
  ☐ I intend to contest jurisdiction over a particular aquatic resource and request the Corps confirm that jurisdiction does/does not exist over the aquatic resource on the parcel.
  ☐ I believe that the site may be comprised entirely of dry land.
  ☐ Other: _____
- Type of determination being requested:
  ☐ I am requesting an approved JD.
  ☑ I am requesting a preliminary JD.
  ☐ I am requesting a "no permit required" letter as I believe my proposed activity is not regulated.
  ☐ I am unclear as to which JD I would like to request and require additional information to inform my decision.

By signing below, you are indicating that you have the authority, or are acting as the duly authorized agent of a person or entity with such authority, to and do hereby grant Corps personnel right of entry to legally access the site if needed to perform the JD. Your signature shall be an affirmation that you possess the requisite property rights to request a JD on the subject property.

*Signature: _____ Date: _____

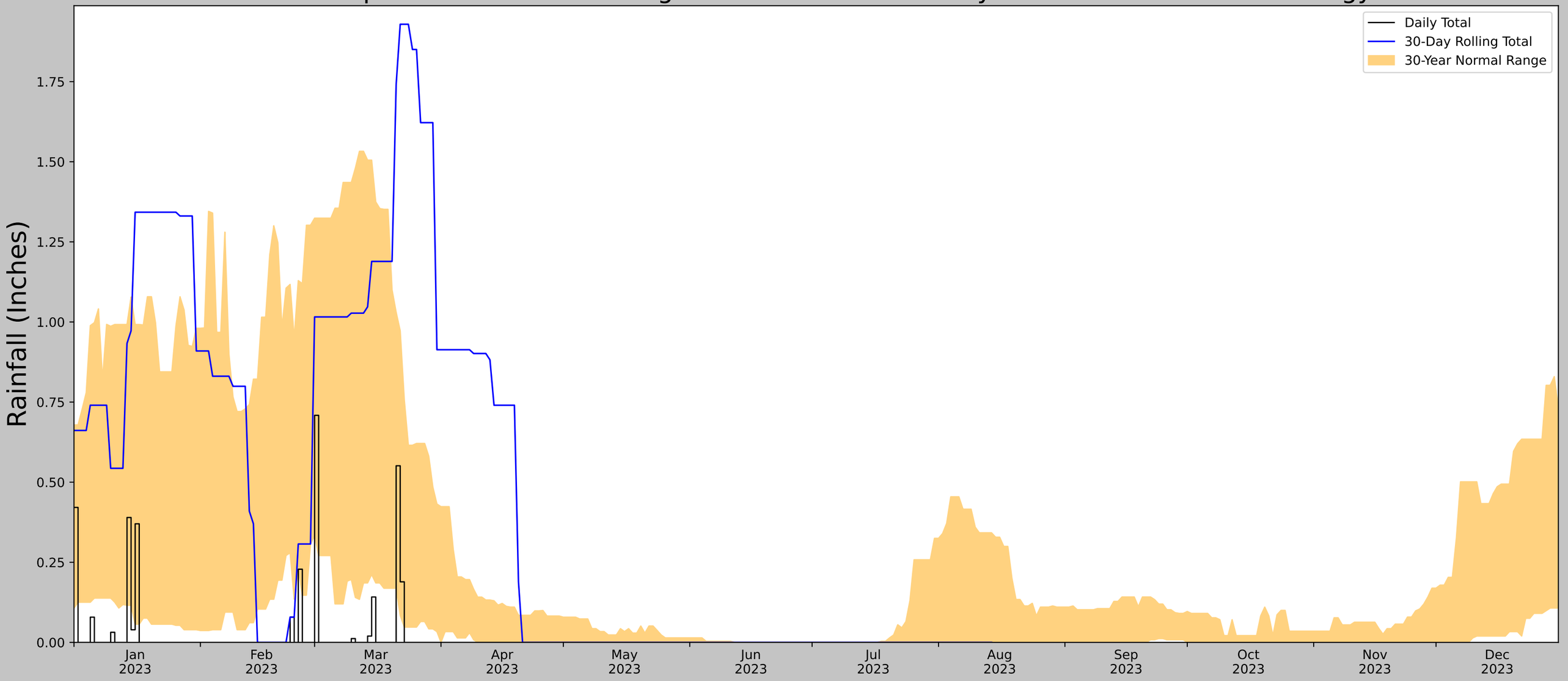
- Typed or printed name: Britney Schultz
  Company name: Dudek
  Address: 78-075 Main Street, Suite G
  La Quinta, CA 92253
  Daytime phone no.: 760-601-3416
  Email address: bschultz@dudek.com

***Authorities:** Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Program of the U.S. Army Corps of Engineers; Final Rule for 33 CFR Parts 320-332.
Principal Purpose: The information that you provide will be used in evaluating your request to determine whether there are any aquatic resources within the project area subject to federal jurisdiction under the regulatory authorities referenced above.
Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public, and may be made available as part of a public notice as required by federal law. Your name and property location where federal jurisdiction is to be determined will be included in the approved jurisdictional determination (AJD), which will be made available to the public on the District's website and on the Headquarters USACE website.
Disclosure: Submission of requested information is voluntary; however, if information is not provided, the request for an AJD cannot be evaluated nor can an AJD be issued.

Appendix B

Antecedent Precipitation Tool Output

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	34.160260, -116.116617
Observation Date	2023-08-09
Elevation (ft)	2154.489
Drought Index (PDSI)	Moderate wetness (2023-07)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-08-09	0.0	0.415748	0.0	Normal	2	3	6
2023-07-10	0.0	0.0	0.0	Normal	2	2	4
2023-06-10	0.0	0.003543	0.0	Normal	2	1	2
Result							Normal Conditions - 12

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
PALM SPRINGS ASOS	33.8222, -116.5044	409.121	32.235	1745.368	70.767	8939	90
PALM SPRINGS	33.8275, -116.5097	424.869	0.476	15.748	0.222	2375	0
THOUSAND PALMS 0.7 W	33.8212, -116.3978	253.937	6.119	155.184	3.703	1	0
INDIO FIRE STN	33.7086, -116.2153	-20.997	18.367	430.118	16.165	30	0
DEEP CANYON LAB	33.6514, -116.3764	1200.131	13.905	791.01	17.256	8	0

Appendix C
Data Forms

OHWM DATA SHEET

Project: 29 Palms Solar **Date:** 4-28-23 **Feature ID:** NWW-16

Investigator(s): K. Dayton and Z. Pringle **Transect ID:** T-1

Site Location:
North of Two Mile Rd. and west of Hillcrest Dr. in Twentynine Palms.

Feature Type: ☒ Ephemeral ☐ Intermittent ☐ Perennial ☐ Other

Transect (cross-section) drawing(s): View Facing: S



☑ Transect length
☑ OHWM width
☑ Channel depth
☑ Photo

OHWM Indicators (at OHWM; primary indicators indicated with *)

- ☐ Natural line impressed on the bank
- ☐ Shelving
- ☑ Changes in the character of soil (texture)*
- ☐ Destruction of terrestrial vegetation
- ☐ Presence of litter and debris
- ☐ Wracking
- ☑ Vegetation matted down, bent, or absent
- ☑ Sediment sorting
- ☐ Leaf litter disturbed or washed away
- ☑ Scour
- ☐ Deposition
- ☐ Bed and banks
- ☐ Water staining
- ☑ Change in plant community and/or cover*

☑ Break in Slope at OHWM*: ☐ Sharp (>60°) ☐ Moderate (30-60°) ☑ Gentle (<30°)

Soil Texture

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM		95%	5%		
Below OHWM		100%			

Total Vegetation Cover

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	—	25	2	73
Below OHWM	—	—	—	100

Veg Stage: ☐ Early (herbs & seedlings) ☑ Mid (herbs, shrubs, saplings) ☐ Late (herbs, shrubs, mature trees)

Upland Species:	***Bank Species:***	***Emergent Species:***
Larrea tridentata Senna armata Ambrosia dumosa Cylindropuntia echinocarpa	same as upland	None

OHWM DATA SHEET

Condition/Disturbances/Anthropogenic Influences (e.g., erosion, grazing, culverts, etc.):

Disturbed by otw activity.

Hydrology

☐ Flowing water	Avg. depth:	Min. depth:
☐ Standing water	Temp:	Max. depth:
☐ Saturated		
☑ Dry		

Checklist of resources (if available):

☑ Aerial photography	☐ Vegetation maps	☑ GPS unit
☐ Remotely-sensed images	☑ Soil maps	☐ Stream gage data
☑ Topographic maps	☑ Rainfall/precipitation data	☐ Other studies:
☑ Geologic maps	☐ Existing delineation(s) for site	

Other drawings (aerial view), notes:

Other forms related to this feature: ☐ Yes ☑ No

☐ Terrace, fringe, or floodplain wetland (wetland datasheet)

☐ Low flow channel or other representative section (OHWM datasheet)

OHWM DATA SHEET

Project: 29 Palms Solar **Date:** 4-28-23 **Feature ID:** NWW-1c

Investigator(s): K. Dayton + Z. Pringle **Transect ID:** T-2

Site Location:
North of Two Mile Rd. and west of Hillcrest Dr. in Twentynine Palms.

Feature Type: ☑ Ephemeral ☐ Intermittent ☐ Perennial ☐ Other

Transect (cross-section) drawing(s): View Facing: N



☑ Transect length
☑ OHWM width
☑ Channel depth
☑ Photo

OHWM Indicators (at OHWM; primary indicators indicated with *)

- ☐ Natural line impressed on the bank
- ☐ Shelving
- ☑ Changes in the character of soil (texture)*
- ☐ Destruction of terrestrial vegetation
- ☐ Presence of litter and debris
- ☑ Wracking
- ☑ Vegetation matted down, bent, or absent
- ☑ Sediment sorting
- ☐ Leaf litter disturbed or washed away
- ☑ Scour
- ☐ Deposition
- ☑ Bed and banks
- ☐ Water staining
- ☑ Change in plant community and/or cover*

☑ Break in Slope at OHWM*: ☑ Sharp (>60°) ☑ Moderate (30-60°) ☐ Gentle (<30°)

Soil Texture

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM		95%	5%		
Below OHWM		100%			

Total Vegetation Cover

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	—	25%	2%	73%
Below OHWM	5%	2%	<1%	92%

Veg Stage: ☐ Early (herbs & seedlings) ☐ Mid (herbs, shrubs, saplings) ☐ Late (herbs, shrubs, mature trees)

Upland Species:	***Bank Species:***	***Emergent Species:***
Larrea tridentata Senna armata Ambrosia dumosa Cylindropuntia echinocarpa	same as upland	Psorothamnos spinosus Ambrosia salsola Senna armata Asclepias sp.

OHWM DATA SHEET

Condition/Disturbances/Anthropogenic Influences (e.g., erosion, grazing, culverts, etc.):

Disturbed by OHV use

Hydrology

☐ Flowing water	Avg. depth:	Min. depth:
☐ Standing water	Temp:	Max. depth:
☐ Saturated		
☑ Dry		

Checklist of resources (if available):

☑ Aerial photography	☐ Vegetation maps	☑ GPS unit
☐ Remotely-sensed images	☑ Soil maps	☐ Stream gage data
☑ Topographic maps	☑ Rainfall/precipitation data	☐ Other studies:
☑ Geologic maps	☐ Existing delineation(s) for site	

Other drawings (aerial view), notes:

Other forms related to this feature: ☐ Yes ☑ No

☐ Terrace, fringe, or floodplain wetland (wetland datasheet)

☐ Low flow channel or other representative section (OHWM datasheet)

OHWM DATA SHEET

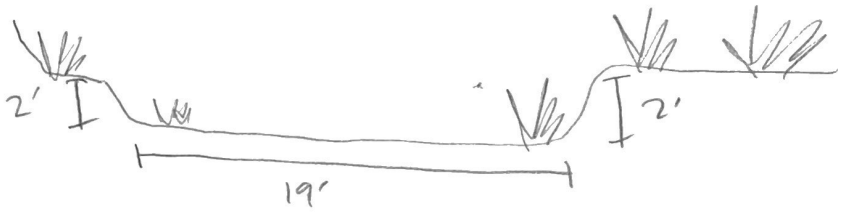
Project: 29 Palms Solar **Date:** 4-28-23 **Feature ID:** NWW-1a

Investigator(s): K. Dayton and Z. Pringle **Transect ID:** T-3

Site Location:
North of Two Mile Rd. and west of Hillcrest Dr. in Twentynine Palms.

Feature Type: ☐ Ephemeral ☐ Intermittent ☐ Perennial ☐ Other

Transect (cross-section) drawing(s): View Facing: N



☑ Transect length
☑ OHWM width
☑ Channel depth
☑ Photo

OHWM Indicators (at OHWM; primary indicators indicated with *)

- ☐ Natural line impressed on the bank
- ☐ Shelving
- ☑ Changes in the character of soil (texture)*
- ☐ Destruction of terrestrial vegetation
- ☐ Presence of litter and debris
- ☐ Wracking
- ☑ Vegetation matted down, bent, or absent
- ☑ Sediment sorting
- ☐ Leaf litter disturbed or washed away
- ☑ Scour
- ☐ Deposition
- ☑ Bed and banks (inconsistent)
- ☐ Water staining
- ☑ Change in plant community and/or cover*

☑ Break in Slope at OHWM*: ☐ Sharp (>60°) ☐ Moderate (30-60°) ☑ Gentle (<30°)

Soil Texture

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM		95%	5%		
Below OHWM		100%			

Total Vegetation Cover

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	—	25	2	73
Below OHWM	—	2	—	98

Veg Stage: ☐ Early (herbs & seedlings) ☐ Mid (herbs, shrubs, saplings) ☐ Late (herbs, shrubs, mature trees)

Upland Species:	***Bank Species:***	***Emergent Species:***
Larrea tridentata Senna armata Ambrosia dumosa Cylindropuntia echinocarpa	Same as upland	Ambrosia salsola Petalonyx thurberi

OHWM DATA SHEET

Condition/Disturbances/Anthropogenic Influences (e.g., erosion, grazing, culverts, etc.):

Disturbed by ORV activity.

Hydrology

☐ Flowing water	Avg. depth:	Min. depth:
☐ Standing water	Temp:	Max. depth:
☐ Saturated		
☑ Dry		

Checklist of resources (if available):

☑ Aerial photography	☐ Vegetation maps	☑ GPS unit
☐ Remotely-sensed images	☑ Soil maps	☐ Stream gage data
☑ Topographic maps	☑ Rainfall/precipitation data	☐ Other studies:
☑ Geologic maps	☐ Existing delineation(s) for site	

Other drawings (aerial view), notes:

Other forms related to this feature: ☐ Yes ☑ No

☐ Terrace, fringe, or floodplain wetland (wetland datasheet)

☐ Low flow channel or other representative section (OHWM datasheet)

OHWM DATA SHEET

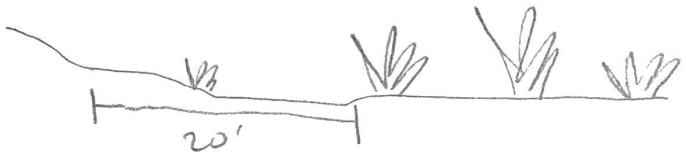
Project: 29 Palms Solar **Date:** 4-28-23 **Feature ID:** N/A -

Investigator(s): K. Dayton and Z. Pringle **Transect ID:** T-4

Site Location:
North of Two Mile Rd. and west of Hillcrest Dr. in Twentynine Palms.

Feature Type: ☐ Ephemeral ☐ Intermittent ☐ Perennial ☒ Other non-jurisidictional

Transect (cross-section) drawing(s): View Facing: E



☒ Transect length
☐ OHWM width N/A
☐ Channel depth N/A
☒ Photo

OHWM Indicators (at OHWM; primary indicators indicated with *) No substantial OHWM indicators.

- ☐ Natural line impressed on the bank
- ☐ Shelving
- ☐ Changes in the character of soil (texture)*
- ☐ Destruction of terrestrial vegetation
- ☐ Presence of litter and debris
- ☐ Wracking
- ☐ Vegetation matted down, bent, or absent
- ☐ Sediment sorting
- ☐ Leaf litter disturbed or washed away
- ☐ Scour
- ☐ Deposition
- ☐ Bed and banks
- ☐ Water staining
- ☐ Change in plant community and/or cover*

☐ Break in Slope at OHWM*: ☐ Sharp (>60°) ☐ Moderate (30-60°) ☐ Gentle (<30°)

Soil Texture

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM		95%	5%		
Below OHWM		95%	5%		

Total Vegetation Cover

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	—	25%	2%	73%
Below OHWM	—	25%	2%	73%

Veg Stage: ☐ Early (herbs & seedlings) ☒ Mid (herbs, shrubs, saplings) ☐ Late (herbs, shrubs, mature trees)

Upland Species:	***Bank Species:***	***Emergent Species:***
Larrea tridentata Senna armata Ambros. d dumosa Cylindropuntia echinocarpa	N/A	N/A

OHWM DATA SHEET

Condition/Disturbances/Anthropogenic influences (e.g., erosion, grazing, culverts, etc.):

Disturbed by OHV use.

Hydrology

☐ Flowing water	Avg. depth:	Min. depth:
☐ Standing water	Temp:	Max. depth:
☐ Saturated		
☒ Dry		

Checklist of resources (if available):

☒ Aerial photography	☐ Vegetation maps	☐ GPS unit
☐ Remotely-sensed images	☒ Soil maps	☐ Stream gage data
☒ Topographic maps	☒ Rainfall/precipitation data	☐ Other studies:
☒ Geologic maps	☐ Existing delineation(s) for site	

Other drawings (aerial view), notes:

Other forms related to this feature: ☐ Yes ☒ No

☐ Terrace, fringe, or floodplain wetland (wetland datasheet)

☐ Low flow channel or other representative section (OHWM datasheet)

OHWM DATA SHEET

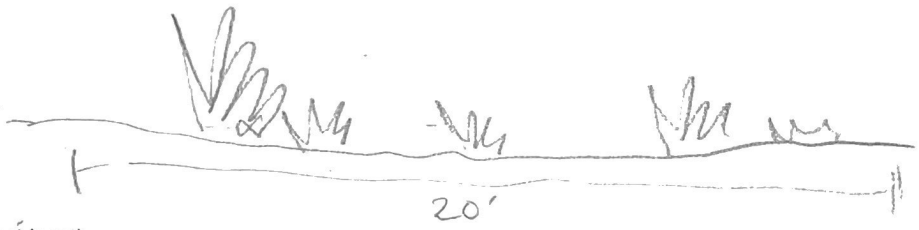
Project: 29 Palms Solar **Date:** 4-28-23 **Feature ID:** N/A

Investigator(s): K. Dayton and Z. Pringle **Transect ID:** T-5

Site Location:
North of Two Mile Rd. and west of Hillcrest Dr. in Twentynine Palms.

Feature Type: ☐ Ephemeral ☐ Intermittent ☐ Perennial ☒ Other non-jurisdictional

Transect (cross-section) drawing(s): View Facing: E



☒ Transect length
☐ OHWM width N/A
☐ Channel depth N/A
☒ Photo

OHWM Indicators (at OHWM; primary indicators indicated with *) No substantial OHWM indicators.

- ☐ Natural line impressed on the bank
- ☐ Shelving
- ☐ Changes in the character of soil (texture)*
- ☐ Destruction of terrestrial vegetation
- ☐ Presence of litter and debris
- ☐ Wracking
- ☐ Vegetation matted down, bent, or absent
- ☐ Sediment sorting
- ☐ Leaf litter disturbed or washed away
- ☐ Scour
- ☐ Deposition
- ☐ Bed and banks
- ☐ Water staining
- ☐ Change in plant community and/or cover*

☐ Break in Slope at OHWM*: ☐ Sharp (>60°) ☐ Moderate (30-60°) ☐ Gentle (<30°)

Soil Texture

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM		95%	5%		
Below OHWM		95%	5%		

Total Vegetation Cover

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	—	25%	2%	73%
Below OHWM	—	25%	2%	73%

Veg Stage: ☐ Early (herbs & seedlings) ☒ Mid (herbs, shrubs, saplings) ☐ Late (herbs, shrubs, mature trees)

Upland Species:	***Bank Species:***	***Emergent Species:***
Larrea tridentata Ambrosia dumosa	N/A	N/A

OHWM DATA SHEET

Condition/Disturbances/Anthropogenic Influences (e.g., erosion, grazing, culverts, etc.):

No anthropogenic disturbances noted at this particular location though OHV activity is prevalent elsewhere.

Hydrology

☐ Flowing water	Avg. depth:	Min. depth:
☐ Standing water	Temp:	Max. depth:
☐ Saturated		
☒ Dry		

Checklist of resources (if available):

☒ Aerial photography	☐ Vegetation maps	☒ GPS unit
☐ Remotely-sensed images	☒ Soil maps	☐ Stream gage data
☒ Topographic maps	☒ Rainfall/precipitation data	☐ Other studies:
☒ Geologic maps	☐ Existing delineation(s) for site	

Other drawings (aerial view), notes:

Other forms related to this feature: ☐ Yes ☒ No

☐ Terrace, fringe, or floodplain wetland (wetland datasheet)

☐ Low flow channel or other representative section (OHWM datasheet)

OHWM DATA SHEET

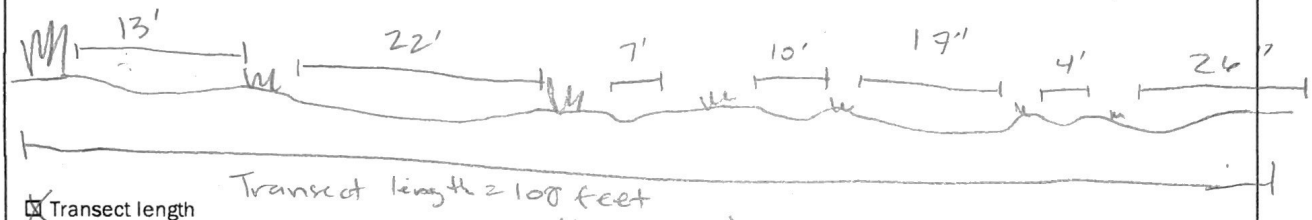
Project: 29 Palms Solar **Date:** 4-28-23 **Feature ID:** NWW-1

Investigator(s): K. Dayton and Z. Pringle **Transect ID:** T-6

Site Location:
North of Two Mile Rd. and west of Hillcrest Dr. in Twentynine Palms

Feature Type: ☐ Ephemeral ☐ Intermittent ☐ Perennial ☐ Other

Transect (cross-section) drawing(s): View Facing: SW



☒ Transect length
☒ OHWM width multiple labeled on diagram above
☒ Channel depth 6-12"
☒ Photo

OHWM Indicators (at OHWM; primary indicators indicated with *)

- ☐ Natural line impressed on the bank
- ☐ Shelving
- ☒ Changes in the character of soil (texture)*
- ☐ Destruction of terrestrial vegetation
- ☐ Presence of litter and debris
- ☐ Wracking
- ☒ Vegetation matted down, bent, or absent
- ☐ Sediment sorting
- ☐ Leaf litter disturbed or washed away
- ☐ Scour
- ☐ Deposition
- ☐ Bed and banks
- ☐ Water staining
- ☐ Change in plant community and/or cover*

☒ Break in Slope at OHWM*: ☐ Sharp (>60°) ☐ Moderate (30-60°) ☒ Gentle (<30°)

Soil Texture

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM		96%	4%		
Below OHWM		100%			

Total Vegetation Cover

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	—	30%	1%	69%
Below OHWM	—	—	—	100%

Veg Stage: ☐ Early (herbs & seedlings) ☒ Mid (herbs, shrubs, saplings) ☐ Late (herbs, shrubs, mature trees)

Upland Species:	***Bank Species:***	***Emergent Species:***
Larrea tridentata Ambrosia salsola Ambrosia dumosa	same as upland	None

OHWM DATA SHEET

Condition/Disturbances/Anthropogenic Influences (e.g., erosion, grazing, culverts, etc.):

OHV activity strongly disturbs this area.

Hydrology

☐ Flowing water	Avg. depth:	Min. depth:
☐ Standing water	Temp:	Max. depth:
☐ Saturated		
☒ Dry		

Checklist of resources (if available):

☒ Aerial photography	☐ Vegetation maps	☒ GPS unit
☐ Remotely-sensed images	☒ Soil maps	☐ Stream gage data
☒ Topographic maps	☒ Rainfall/precipitation data	☐ Other studies:
☒ Geologic maps	☐ Existing delineation(s) for site	

Other drawings (aerial view), notes:

Other forms related to this feature: ☐ Yes ☒ No

☐ Terrace, fringe, or floodplain wetland (wetland datasheet)

☐ Low flow channel or other representative section (OHWM datasheet)

OHWM DATA SHEET

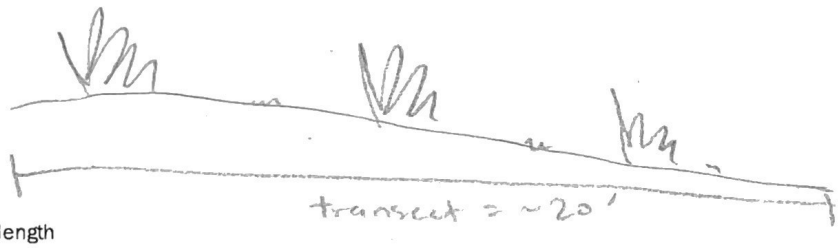
Project: 29 Palms Solar **Date:** 4-28-23 **Feature ID:** N/A

Investigator(s): K. Dayton and Z. Pringle **Transect ID:** T-7

Site Location:
North of Two Mile Rd. and west of Hillcrest Dr. in Twentynine Palms.

Feature Type: ☐ Ephemeral ☐ Intermittent ☐ Perennial ☒ Other non-jurisdictional

Transect (cross-section) drawing(s): View Facing: SE



☒ Transect length
☐ OHWM width N/A
☐ Channel depth N/A
☒ Photo

OHWM Indicators (at OHWM; primary indicators indicated with *) No substantial OHWM indicators.

- ☐ Natural line impressed on the bank
- ☐ Shelving
- ☐ Changes in the character of soil (texture)*
- ☐ Destruction of terrestrial vegetation
- ☐ Presence of litter and debris
- ☐ Wracking
- ☐ Vegetation matted down, bent, or absent
- ☐ Sediment sorting
- ☐ Leaf litter disturbed or washed away
- ☐ Scour
- ☐ Deposition
- ☐ Bed and banks
- ☐ Water staining
- ☐ Change in plant community and/or cover*

☐ Break in Slope at OHWM*: ☐ Sharp (>60°) ☐ Moderate (30-60°) ☐ Gentle (<30°)

Soil Texture

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM		60%	40%		
Below OHWM		60%	40%		

Total Vegetation Cover

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	—	20%	2%	77%
Below OHWM	—	20%	2%	77%

Veg Stage: ☐ Early (herbs & seedlings) ☒ Mid (herbs, shrubs, saplings) ☐ Late (herbs, shrubs, mature trees)

Upland Species:	*Bank Species:*	*Emergent Species:*
Larrea tridentata	N/A	N/A

OHWM DATA SHEET

Condition/Disturbances/Anthropogenic Influences (e.g., erosion, grazing, culverts, etc.):

No anthropogenic disturbances noted at this particular location though OHV activity is prevalent elsewhere.

Hydrology

☐ Flowing water	Avg. depth:	Min. depth:
☐ Standing water	Temp:	Max. depth:
☐ Saturated		
☒ Dry		

Checklist of resources (if available):

☒ Aerial photography	☐ Vegetation maps	☒ GPS unit
☐ Remotely-sensed images	☒ Soil maps	☐ Stream gage data
☒ Topographic maps	☒ Rainfall/precipitation data	☐ Other studies:
☒ Geologic maps	☐ Existing delineation(s) for site	

Other drawings (aerial view), notes:

Other forms related to this feature: ☐ Yes ☒ No

☐ Terrace, fringe, or floodplain wetland (wetland datasheet)

☐ Low flow channel or other representative section (OHWM datasheet)

OHWM DATA SHEET

Project: 29 Palms Solar **Date:** 4-28-23 **Feature ID:** N/A

Investigator(s): K. Dayton and Z. Pringle **Transect ID:** T-8

Site Location:
North of Two Mile Rd. and west of Hillcrest Dr. in Twentynine Palms.

Feature Type: ☐ Ephemeral ☐ Intermittent ☐ Perennial ☒ Other non-jurisdictional

Transect (cross-section) drawing(s): View Facing: N



☒ Transect length
☐ OHWM width N/A
☐ Channel depth N/A
☒ Photo

OHWM Indicators (at OHWM; primary indicators indicated with *) No substantial OHWM indicators.

- ☐ Natural line impressed on the bank
- ☐ Shelving
- ☐ Changes in the character of soil (texture)*
- ☐ Destruction of terrestrial vegetation
- ☐ Presence of litter and debris
- ☐ Wracking
- ☐ Vegetation matted down, bent, or absent
- ☐ Sediment sorting
- ☐ Leaf litter disturbed or washed away
- ☐ Scour
- ☐ Deposition
- ☐ Bed and banks
- ☐ Water staining
- ☐ Change in plant community and/or cover*

☐ Break in Slope at OHWM*: ☐ Sharp (>60°) ☐ Moderate (30-60°) ☐ Gentle (<30°)

Soil Texture

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM		98%	2%		
Below OHWM		98%	2%		

Total Vegetation Cover

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	—	20%	2%	77%
Below OHWM	—	20%	2%	77%

Veg Stage: ☐ Early (herbs & seedlings) ☒ Mid (herbs, shrubs, saplings) ☐ Late (herbs, shrubs, mature trees)

Upland Species:	*Bank Species:*	*Emergent Species:*
Larrea tridentata Ambrosia salsola	N/A	N/A

OHWM DATA SHEET

Condition/Disturbances/Anthropogenic Influences (e.g., erosion, grazing, culverts, etc.):

Disturbed by OHV activity.

Hydrology

☐ Flowing water	Avg. depth:	Min. depth:
☐ Standing water	Temp:	Max. depth:
☐ Saturated		
☒ Dry		

Checklist of resources (if available):

☒ Aerial photography	☐ Vegetation maps	☒ GPS unit
☐ Remotely-sensed images	☒ Soil maps	☐ Stream gage data
☒ Topographic maps	☒ Rainfall/precipitation data	☐ Other studies:
☒ Geologic maps	☐ Existing delineation(s) for site	

Other drawings (aerial view), notes:

Other forms related to this feature: ☐ Yes ☒ No

☐ Terrace, fringe, or floodplain wetland (wetland datasheet)

☐ Low flow channel or other representative section (OHWM datasheet)

OHWM DATA SHEET

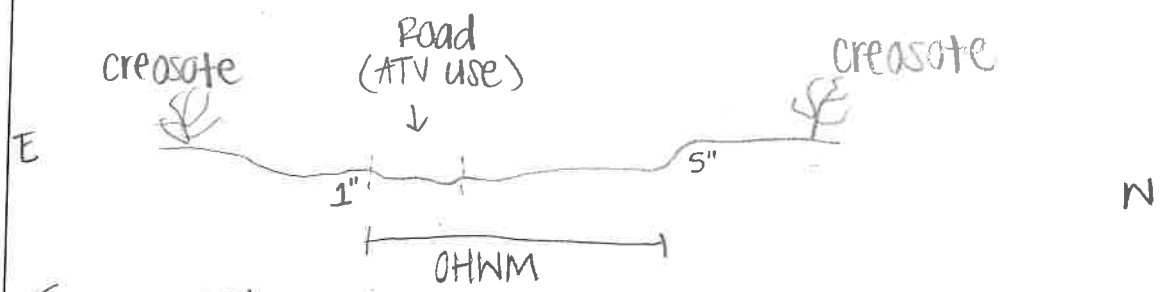
Project: 29 Palms Date: 8-9-23 Feature ID: NWW-1d

Investigator(s): Britney Schultz, Sarah Green, Luz Badillo Transect ID: T-9

Site Location:

Feature Type: ☐ Ephemeral ☐ Intermittent ☐ Perennial ☐ Other

Transect (cross-section) drawing(s): View Facing: S



☑ Transect length 68'
☑ OHWM width 32'
☑ Channel depth
☑ Photo

OHWM Indicators (at OHWM; primary indicators indicated with *)

- ☐ Natural line impressed on the bank
- ☑ Shelving
- ☑ Changes in the character of soil (texture)*
- ☐ Destruction of terrestrial vegetation
- ☐ Presence of litter and debris
- ☑ Wracking
- ☐ Vegetation matted down, bent, or absent
- ☐ Sediment sorting
- ☐ Leaf litter disturbed or washed away
- ☐ Scour
- ☑ Deposition
- ☑ Bed and banks
- ☐ Water staining
- ☐ Change in plant community and/or cover*

☑ Break in Slope at OHWM*: ☐ Sharp (>60°) ☐ Moderate (30-60°) ☑ Gentle (<30°)

Soil Texture

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM		~5%	>75%	25%	
Below OHWM		>75%	25%	~5%	

Total Vegetation Cover

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM		15-25%	1-5%	>75%
Below OHWM		1-5%	<1%	>75%

Veg Stage: ☐ Early (herbs & seedlings) ☐ Mid (herbs, shrubs, saplings) ☐ Late (herbs, shrubs, mature trees)

Upland Species:	*Bank Species:*	~~*Emergent*~~ *Species:*
lartra ambrosia dumosa Cylech Kragra ephedra		Below OH AMBSAL EPH sp.

OHWM DATA SHEET

Condition/Disturbances/Anthropogenic Influences (e.g., erosion, grazing, culverts, etc.):
Eastern portion of feature has significant tire tracks going through.

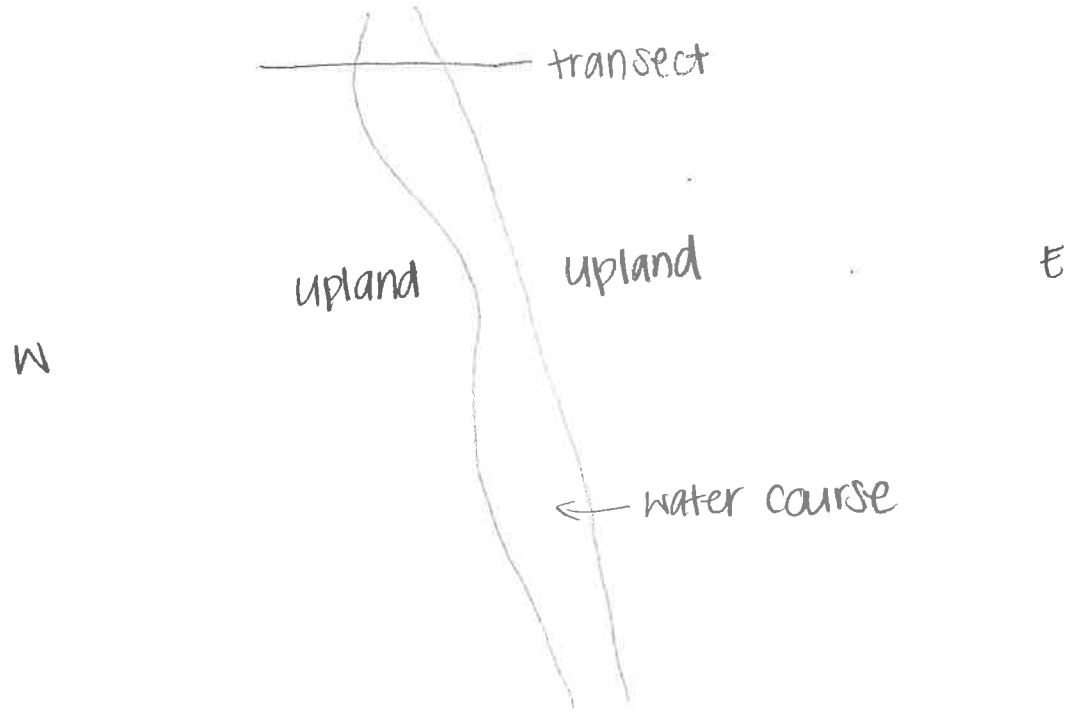
Hydrology

☐ Flowing water	Avg. depth:	Min. depth:
☐ Standing water	Temp:	Max. depth:
☐ Saturated		
☑ Dry		

Checklist of resources (if available):

☑ Aerial photography	☑ Vegetation maps	☑ GPS unit
☐ Remotely-sensed images	☑ Soil maps	☐ Stream gage data
☑ Topographic maps	☑ Rainfall/precipitation data	☐ Other studies:
☐ Geologic maps	☐ Existing delineation(s) for site	

Other drawings (aerial view), notes:



Other forms related to this feature: ☐ Yes ☐ No

☐ Terrace, fringe, or floodplain wetland (wetland datasheet)
☐ Low flow channel or other representative section (OHWM datasheet)

OHWM DATA SHEET

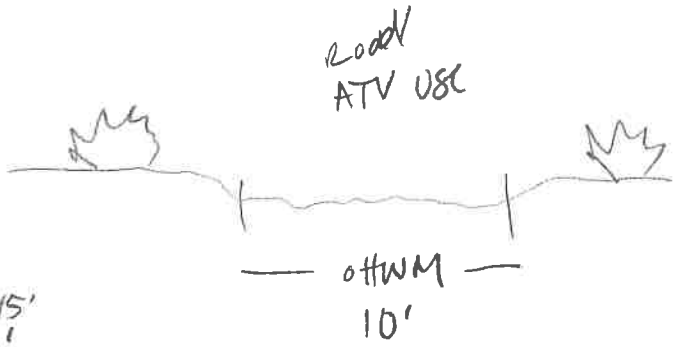
Project: 29 Palms Date: 8-9-23 Feature ID: NWW-16

Investigator(s): B. Schultz, S Greely, L. Badillo Transect ID: T-10

Site Location: off-site area w/in gen-tie alignment, North of two-mile Rd.

Feature Type: ☑ Ephemeral ☐ Intermittent ☐ Perennial ☐ Other

Transect (cross-section) drawing(s): View Facing: SW



☑ Transect length ~45'
☐ OHWM width 10'
☐ Channel depth 2-4''
☑ Photo

OHWM Indicators (at OHWM; primary indicators indicated with *)

- ☐ Natural line impressed on the bank
- ☐ Shelving
- ☑ Changes in the character of soil (texture)*
- ☐ Destruction of terrestrial vegetation
- ☐ Presence of litter and debris
- ☐ Wracking
- ☐ Vegetation matted down, bent, or absent
- ☐ Sediment sorting
- ☐ Leaf litter disturbed or washed away
- ☐ Scour
- ☐ Deposition
- ☐ Bed and banks
- ☐ Water staining
- ☑ Change in plant community and/or cover*

☑ Break in Slope at OHWM*: ☐ Sharp (>60°) ☐ Moderate (30-60°) ☑ Gentle (<30°)

Soil Texture

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM	—	75-85	10-15	5-15	—
Below OHWM	—	100%	—	—	—

Total Vegetation Cover

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	—	15-25	1-5	50-75
Below OHWM	—	—	—	100

Veg Stage: ☐ Early (herbs & seedlings) ☐ Mid (herbs, shrubs, saplings) ☐ Late (herbs, shrubs, mature trees)

Upland Species:	*Bank Species:*	*Emergent Species:*
lar tri Amb dum		

OHWM DATA SHEET

Condition/Disturbances/Anthropogenic Influences (e.g., erosion, grazing, culverts, etc.):

Disturbed by OHV/ATV uses

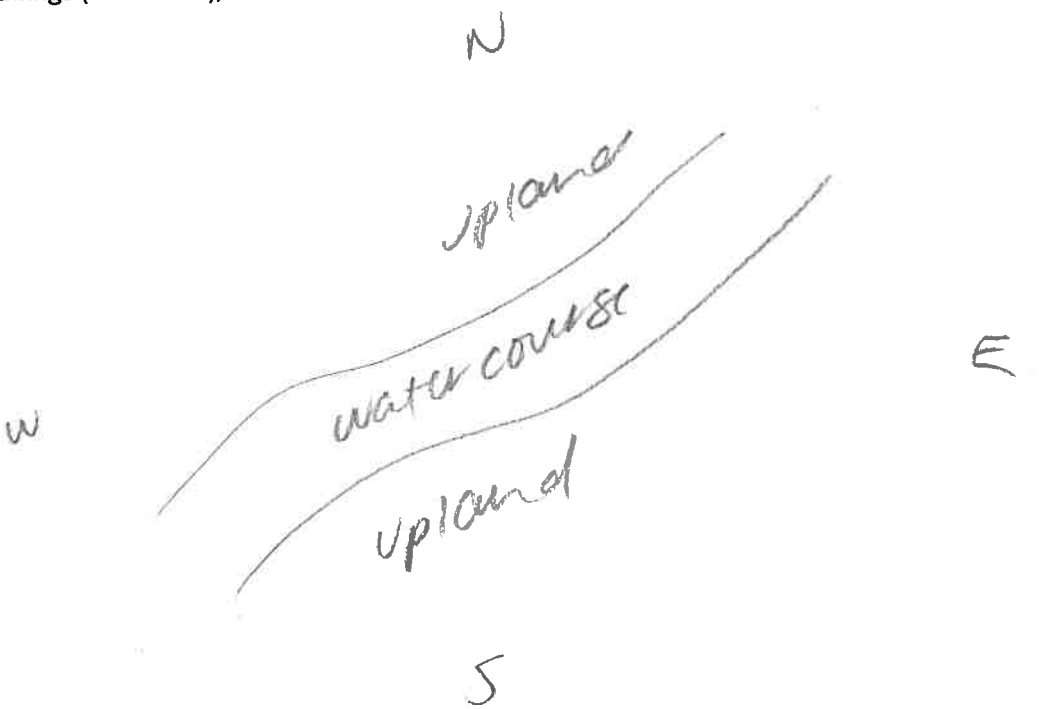
Hydrology

☐ Flowing water	Avg. depth:	Min. depth:
☐ Standing water	Temp:	Max. depth:
☐ Saturated		
☑ Dry		

Checklist of resources (if available):

☑ Aerial photography	☑ Vegetation maps	☑ GPS unit
☐ Remotely-sensed images	☑ Soil maps	☐ Stream gage data
☑ Topographic maps	☑ Rainfall/precipitation data	☐ Other studies:
☑ Geologic maps	☐ Existing delineation(s) for site	

Other drawings (aerial view), notes:



Other forms related to this feature: ☐ Yes ☑ No

☐ Terrace, fringe, or floodplain wetland (wetland datasheet)

☐ Low flow channel or other representative section (OHWM datasheet)

OHWM DATA SHEET

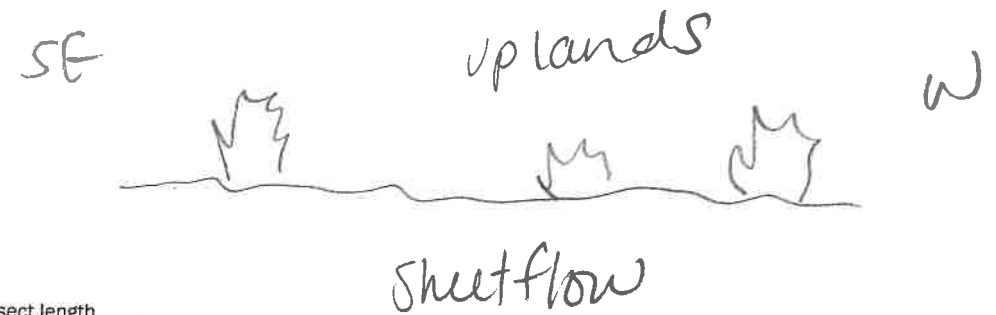
Project: 29 Palms Date: 8-9-23 Feature ID: N/A

Investigator(s): B. Schultz, S. Greely, L. Badillo Transect ID: T-11

Site Location: west central portion of review area

Feature Type: ☐ Ephemeral ☐ Intermittent ☐ Perennial ☒ Other Non-jurisdictional

Transect (cross-section) drawing(s): View Facing: ____



☐ Transect length
☐ OHWM width N/A
☐ Channel depth N/A
☐ Photo

OHWM Indicators (at OHWM; primary indicators indicated with *) No OHWM indicators

- ☐ Natural line impressed on the bank
- ☐ Shelving
- ☐ Changes in the character of soil (texture)*
- ☐ Destruction of terrestrial vegetation
- ☐ Presence of litter and debris
- ☐ Wracking
- ☐ Vegetation matted down, bent, or absent
- ☐ Sediment sorting
- ☐ Leaf litter disturbed or washed away
- ☐ Scour
- ☐ Deposition
- ☐ Bed and banks
- ☐ Water staining
- ☐ Change in plant community and/or cover*

☐ Break in Slope at OHWM*: ☐ Sharp (>60°) ☐ Moderate (30-60°) ☐ Gentle (<30°)

Soil Texture

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM	—	60	30	10	—
Below OHWM		60	30	10	—

Total Vegetation Cover

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	—	30	—	70
Below OHWM		30	—	70

Veg Stage: ☐ Early (herbs & seedlings) ☐ Mid (herbs, shrubs, saplings) ☐ Late (herbs, shrubs, mature trees)

Upland Species:	*Bank Species:*	*Emergent Species:*
Lar tri Amb sal	N/A	N/A

OHWM DATA SHEET

Condition/Disturbances/Anthropogenic Influences (e.g., erosion, grazing, culverts, etc.):

N/A

Hydrology N/A – sheetflow due to topography

☐ Flowing water	Avg. depth:	Min. depth:
☐ Standing water	Temp:	Max. depth:
☐ Saturated		
☐ Dry		

Checklist of resources (if available):

☐ Aerial photography	☑ Vegetation maps	☐ GPS unit
☐ Remotely-sensed images	☐ Soil maps	☐ Stream gage data
☐ Topographic maps	☐ Rainfall/precipitation data	☐ Other studies:
☐ Geologic maps	☐ Existing delineation(s) for site	

Other drawings (aerial view), notes:

Other forms related to this feature: ☐ Yes ☑ No

☐ Terrace, fringe, or floodplain wetland (wetland datasheet)

☐ Low flow channel or other representative section (OHWM datasheet)

SDAM-T-01

Field form for the beta Arid Streamflow Duration Assessment Method
Revision Date November 2023

Beta Arid West Streamflow Duration Assessment Method

General site information

Project name or number: 29 Palms Solar Project		
Site code or identifier: 14392	Assessor(s): B. Schultz, C. Amoaku	
Waterway name: SDAM-T-01		Visit date: 6/17/24
Current weather conditions (check one) ☐ Storm/heavy rain ☐ Steady rain ☐ Intermittent rain ☐ Snowing ☐ Cloudy (___ % cover) ☑ Clear/Sunny	Notes on current or recent weather conditions (e.g., precipitation in previous week):	Coordinates at downstream end (decimal degrees): Lat (N): 34°9'30" N Long (W): 116°7'17" W Datum:
Surrounding land-use within 100 m (check one or two): ☐ Urban/industrial/residential ☐ Agricultural (farmland, crops, vineyards, pasture) ☐ Developed open-space (e.g., golf course) ☐ Forested ☑ Other natural ☐ Other: _____	Describe reach boundaries: middle reach of western stream channel (flow N/NE)	
Mean channel width (m) 3.38 m	Reach length (m): 40x width; min 40 m; max 200 m. 120 m	Enter photo ID, or check if completed Top down: ✓ Mid down: ✓ Mid up: ✓ Bottom up: ✓
Disturbed or difficult conditions (check all that apply): ☐ Recent flood or debris flow ☐ Stream modifications (e.g., channelization) ☐ Diversions ☐ Discharges ☐ Drought ☐ Vegetation removal/limitations ☑ Other (explain in notes) ☐ None	Notes on disturbances or difficult site conditions: ATV off-road use w/in stream channel	
Observed hydrology: 0 % of reach with surface flow 0 % of reach with sub-surface or surface flow 0 # of isolated pools	Comments on observed hydrology:	

Site sketch:



1. Hydrophytic plant species

Record up to 5 hydrophytic plant species (FACW or OBL in the **Arid West** regional wetland plant list) within the assessment area: **within the channel or up to one half-channel width**. Explain in notes if species has an odd distribution (e.g., covers less than 2% of assessment area, long-lived species solely represented by seedlings, or long-lived species solely represented by specimens in decline), or if there is uncertainty about the identification. Enter photo ID, or check if photo is taken.

Check if applicable: ☑ No vegetation in assessment area ☑ No hydrophytes in assessment area

Species	Odd distribution?	Notes	Photo ID
N/A			

Notes on hydrophytic vegetation:

2 and 3. Aquatic invertebrates

2. How many aquatic invertebrates are quantified in a 15-minute search?

Number of individuals quantified:
- ☑ None
- ☐ 1 to 19
- ☐ 20 +

(Do not count mosquitos)

Photo ID: _____

3. Is there evidence of aquatic stages of EPT (Ephemeroptera, Plecoptera and Trichoptera)?

Yes / No



Ephemeroptera larva
Image credit: Dieter Tracey



Plecoptera larva
Tracey Saxby



Trichoptera larva
Tracey Saxby

Notes on aquatic invertebrates:

4. Algal Cover

Are algae found on the streambed?		Notes on algae cover:	Photo ID:
☐ Check if *all* observed algae appear to be deposited from an upstream source.	☑ Not detected ☐ Yes, < 10% cover ☐ Yes, ≥ 10% (check Yes in single indicator below)		

5. Are single indicators observed?

Indicator	Present	Notes	Photo ID
Fish	☐ Yes ☑ No, no fish ☐ No, only non-native mosquitofish		
Algae cover ≥ 10%	☐ Yes ☑ No		

Supplemental information E.g., aquatic or semi-aquatic amphibians, snakes, or turtles; iron-oxidizing bacteria and fungi; etc.

N/A

Photo log

Indicate if any other photos taken during the assessment

Photo ID	Description
See Field maps / SoLocator	- Top down - mid up - mid down - Bottom up

Additional notes about the assessment:

Classification: Ephemeral

1. Hydrophytic plant species	2. Aquatic invertebrates	3. EPT taxa	4. Algae	5. Single indicators • fish present • algae cover ≥ 10%	Classification
None	None	Absent	Absent	Absent	**Ephemeral**
				Present	**At least intermittent**
			Present		**Intermittent**
	Few (1-19)	Absent	Absent	Absent	**Less than Perennial**
				Present	**At least intermittent**
			Present		**At least intermittent**
		Present	Absent		**Intermittent**
			Present		**Perennial**
	Many (20+)	Absent	Absent	Absent	**Ephemeral**
				Present	**At least intermittent**
			Present	Absent	**Ephemeral**
				Present	**At least intermittent**
		Present			**Intermittent**
Few (1-2)	None				**Intermittent**
	Few (1-19)	Absent			**Intermittent**
		Present	Absent		**Intermittent**
			Present		**Perennial**
	Many (20+)	Absent			**Intermittent**
		Present	Absent		**Perennial**
			Present		**Intermittent**
Many (3+)	None				**Intermittent**
	Few (1-19)	Absent	Absent		**Intermittent**
			Present		**Perennial**
		Present			**Perennial**
	Many (20+)				**Perennial**

Shading provided to enhance readability by increasing the contrast between neighboring cells; empty cells indicate the classification will not change with additional information however it is recommended that all five indicators be measured and recorded during every assessment.

SDAM-T-02

Field form for the beta Arid Streamflow Duration Assessment Method
Revision Date November 2023

Beta Arid West Streamflow Duration Assessment Method

General site information

Project name or number: 29 Palms Solar		
Site code or identifier: 14392	Assessor(s): B Scholtz, C. Amoak U	
Waterway name: SDAM-T-02		Visit date: 6/17/24
Current weather conditions (check one) ☐ Storm/heavy rain ☐ Steady rain ☐ Intermittent rain ☐ Snowing ☐ Cloudy (___ % cover) ☑ Clear/Sunny	Notes on current or recent weather conditions (e.g., precipitation in previous week):	Coordinates at downstream end (decimal degrees): Lat (N): 34°9'49" N Long (W): 116°7'11" W Datum:
Surrounding land-use within 100 m (check one or two): ☐ Urban/industrial/residential ☐ Agricultural (farmland, crops, vineyards, pasture) ☐ Developed open-space (e.g., golf course) ☐ Forested ☑ Other natural ☐ Other: _____	Describe reach boundaries: upstream reach w/in northwestern corner of project.	
Mean channel width (m): 75 m	Reach length (m): 40x width; min 40 m; max 200 m. 200 m	Enter photo ID, or check if completed Top down: ✓ Mid down: ✓ Mid up: ✓ Bottom up: ✓
Disturbed or difficult conditions (check all that apply): ☐ Recent flood or debris flow ☐ Stream modifications (e.g., channelization) ☐ Diversions ☐ Discharges ☐ Drought ☐ Vegetation removal/limitations ☑ Other (explain in notes) ☐ None	Notes on disturbances or difficult site conditions: ATV off-road use	
Observed hydrology: 0 % of reach with surface flow 0 % of reach with sub-surface or surface flow 0 # of isolated pools	Comments on observed hydrology:	

Site sketch:



1. Hydrophytic plant species

Record up to 5 hydrophytic plant species (FACW or OBL in the **Arid West** regional wetland plant list) within the assessment area: **within the channel or up to one half-channel width.** Explain in notes if species has an odd distribution (e.g., covers less than 2% of assessment area, long-lived species solely represented by seedlings, or long-lived species solely represented by specimens in decline), or if there is uncertainty about the identification. Enter photo ID, or check if photo is taken.

Check if applicable: ☐ No vegetation in assessment area ☑ No hydrophytes in assessment area

Species	Odd distribution?	Notes	Photo ID

Notes on hydrophytic vegetation:

vegetation w/in channel is dominated by PSOSP1 (which is upland)

2 and 3. Aquatic invertebrates

2. How many aquatic invertebrates are quantified in a 15-minute search?

Number of individuals quantified:
- ☑ None
- ☐ 1 to 19
- ☐ 20 +

(Do not count mosquitos)

Photo ID: _____

3. Is there evidence of aquatic stages of EPT (Ephemeroptera, Plecoptera and Trichoptera)?

Yes / No



Ephemeroptera larva
Image credit: Dieter Tracey



Plecoptera larva
Tracey Saxby



Trichoptera larva
Tracey Saxby

Notes on aquatic invertebrates:

4. Algal Cover

Are algae found on the streambed?		Notes on algae cover:	Photo ID:
☐ Check if *all* observed algae appear to be deposited from an upstream source.	☑ Not detected ☐ Yes, < 10% cover ☐ Yes, ≥ 10% (check Yes in single indicator below)		

5. Are single indicators observed?

Indicator	Present	Notes	Photo ID
Fish	☐ Yes ☑ No, no fish ☐ No, only non-native mosquitofish		
Algae cover ≥ 10%	☐ Yes ☑ No		

Supplemental information E.g., aquatic or semi-aquatic amphibians, snakes, or turtles; iron-oxidizing bacteria and fungi; etc.

Photo log

Indicate if any other photos taken during the assessment

Photo ID	Description
See Field maps / Solocator	
	Top down
	mid up
	mid down
	Bottom up

Additional notes about the assessment:

Classification: Ephemeral

1. Hydrophytic plant species	2. Aquatic invertebrates	3. EPT taxa	4. Algae	5. Single indicators • fish present • algae cover ≥ 10%	Classification
None	None	Absent	Absent	Absent	**Ephemeral**
				Present	**At least intermittent**
			Present		**Intermittent**
	Few (1-19)	Absent	Absent	Absent	**Less than Perennial**
				Present	**At least intermittent**
			Present		**At least intermittent**
		Present	Absent		**Intermittent**
			Present		**Perennial**
	Many (20+)	Absent	Absent	Absent	**Ephemeral**
				Present	**At least intermittent**
			Present	Absent	**Ephemeral**
				Present	**At least intermittent**
		Present			**Intermittent**
Few (1-2)	None				**Intermittent**
	Few (1-19)	Absent			**Intermittent**
		Present	Absent		**Intermittent**
			Present		**Perennial**
	Many (20+)	Absent			**Intermittent**
		Present	Absent		**Perennial**
			Present		**Intermittent**
Many (3+)	None				**Intermittent**
	Few (1-19)	Absent	Absent		**Intermittent**
			Present		**Perennial**
		Present			**Perennial**
	Many (20+)				**Perennial**

Shading provided to enhance readability by increasing the contrast between neighboring cells; empty cells indicate the classification will not change with additional information however it is recommended that all five indicators be measured and recorded during every assessment.

SDAM-T-03

Field form for the beta Arid Streamflow Duration Assessment Method
Revision Date November 2023

Beta Arid West Streamflow Duration Assessment Method

General site information

Project name or number: 29 Palms Solar		
Site code or identifier: 14392	Assessor(s): B. Schultz, C. Amoaku	
Waterway name: SDAM-T-03		Visit date: 6/17/24
Current weather conditions (check one) ☐ Storm/heavy rain ☐ Steady rain ☐ Intermittent rain ☐ Snowing ☐ Cloudy (___ % cover) ☑ Clear/Sunny	Notes on current or recent weather conditions (e.g., precipitation in previous week):	Coordinates at downstream end (decimal degrees): Lat (N): 34°9'47.11" N Long (W): 116°7'5" W Datum:
Surrounding land-use within 100 m (check one or two): ☐ Urban/industrial/residential ☐ Agricultural (farmland, crops, vineyards, pasture) ☐ Developed open-space (e.g., golf course) ☐ Forested ☑ Other natural ☐ Other: _____	Describe reach boundaries: Downstream reach w/in north-central portion of site.	
Mean channel width (m) 4.77	Reach length (m): 40x width; min 40 m; max 200 m. 190.8	Enter photo ID, or check if completed Top down: ✓ Mid down: ✓ Mid up: ✓ Bottom up: ✓
Disturbed or difficult conditions (check all that apply): ☐ Recent flood or debris flow ☐ Stream modifications (e.g., channelization) ☐ Diversions ☐ Discharges ☐ Drought ☐ Vegetation removal/limitations ☑ Other (explain in notes) ☐ None	Notes on disturbances or difficult site conditions: ATV off-road use	
Observed hydrology: 0 % of reach with surface flow 0 % of reach with sub-surface or surface flow 0 # of isolated pools	Comments on observed hydrology:	

Site sketch:



1. Hydrophytic plant species

Record up to 5 hydrophytic plant species (FACW or OBL in the **Arid West** regional wetland plant list) within the assessment area: **within the channel or up to one half-channel width**. Explain in notes if species has an odd distribution (e.g., covers less than 2% of assessment area, long-lived species solely represented by seedlings, or long-lived species solely represented by specimens in decline), or if there is uncertainty about the identification. Enter photo ID, or check if photo is taken.

Check if applicable: ☐ No vegetation in assessment area ☐ No hydrophytes in assessment area

Species	Odd distribution?	Notes	Photo ID

Notes on hydrophytic vegetation:

2 and 3. Aquatic invertebrates

2. How many aquatic invertebrates are quantified in a 15-minute search?

Number of individuals quantified:
- ☐ None
- ☐ 1 to 19
- ☐ 20 +

(Do not count mosquitos)

Photo ID:_____

3. Is there evidence of aquatic stages of EPT (Ephemeroptera, Plecoptera and Trichoptera)?

Yes / No



Ephemeroptera larva
Image credit: Dieter Tracey



Plecoptera larva
Tracey Saxby



Trichoptera larva
Tracey Saxby

Notes on aquatic invertebrates:

4. Algal Cover

Are algae found on the streambed? ☐ Check if *all* observed algae appear to be deposited from an upstream source.	☐ Not detected ☐ Yes, < 10% cover ☐ Yes, ≥ 10% (check Yes in single indicator below)	Notes on algae cover:	Photo ID:

5. Are single indicators observed?

Indicator	Present	Notes	Photo ID
Fish	☐ Yes ☐ No, no fish ☐ No, only non-native mosquitofish		
Algae cover ≥ 10%	☐ Yes ☐ No		

Supplemental information E.g., aquatic or semi-aquatic amphibians, snakes, or turtles; iron-oxidizing bacteria and fungi; etc.

Photo log

Indicate if any other photos taken during the assessment

Photo ID	Description
See Fieldmaps / Solocator	
Top down	
mid up	
mid down	
Bottom up	

Additional notes about the assessment:

Classification: Ephemeral

1. Hydrophytic plant species	2. Aquatic invertebrates	3. EPT taxa	4. Algae	5. Single indicators • fish present • algae cover ≥ 10%	Classification
None	None	Absent	Absent	Absent	**Ephemeral**
				Present	**At least intermittent**
			Present		**Intermittent**
	Few (1-19)	Absent	Absent	Absent	**Less than Perennial**
				Present	**At least intermittent**
			Present		**At least intermittent**
		Present	Absent		**Intermittent**
			Present		**Perennial**
	Many (20+)	Absent	Absent	Absent	**Ephemeral**
				Present	**At least intermittent**
			Present	Absent	**Ephemeral**
				Present	**At least intermittent**
		Present			**Intermittent**
Few (1-2)	None				**Intermittent**
	Few (1-19)	Absent			**Intermittent**
		Present	Absent		**Intermittent**
			Present		**Perennial**
	Many (20+)	Absent			**Intermittent**
		Present	Absent		**Perennial**
			Present		**Intermittent**
Many (3+)	None				**Intermittent**
	Few (1-19)	Absent	Absent		**Intermittent**
			Present		**Perennial**
		Present			**Perennial**
	Many (20+)				**Perennial**

Shading provided to enhance readability by increasing the contrast between neighboring cells; empty cells indicate the classification will not change with additional information however it is recommended that all five indicators be measured and recorded during every assessment.

SDAM-T-04

Field form for the beta Arid Streamflow Duration Assessment Method
Revision Date November 2023

Beta Arid West Streamflow Duration Assessment Method

General site information

Project name or number: 29 Palms Solar		
Site code or identifier: 14392	Assessor(s): B. Schultz, C. Amoaku	
Waterway name: SDAM-T-04		Visit date: 6-17-24

Current weather conditions (check one)
- ☐ Storm/heavy rain
- ☐ Steady rain
- ☐ Intermittent rain
- ☐ Snowing
- ☐ Cloudy (___ % cover)
- ☑ Clear/Sunny

Notes on current or recent weather conditions (e.g., precipitation in previous week):

Coordinates at downstream end (decimal degrees):
Lat (N):
Long (W):
Datum:

Surrounding land-use within 100 m (check one or two):
- ☐ Urban/industrial/residential
- ☐ Agricultural (farmland, crops, vineyards, pasture)
- ☐ Developed open-space (e.g., golf course)
- ☐ Forested
- ☐ Other natural
- ☐ Other: _____

Describe reach boundaries:
Middle reach - eastern portion of site.

Mean channel width (m)	Reach length (m): 40x width; min 40 m; max 200 m.	Enter photo ID, or check if completed
3.5 m	130 m	Top down: ✓ Mid down: ✓ Mid up: ✓ Bottom up: ✓

Disturbed or difficult conditions (check all that apply):
- ☐ Recent flood or debris flow
- ☐ Stream modifications (e.g., channelization)
- ☐ Diversions
- ☐ Discharges
- ☐ Drought
- ☐ Vegetation removal/limitations
- ☑ Other (explain in notes)
- ☐ None

Notes on disturbances or difficult site conditions:
OHV use in channel.

Observed hydrology:
- 0 % of reach with surface flow
- 0 % of reach with sub-surface or surface flow
- 0 # of isolated pools

Comments on observed hydrology:

Site sketch:



1. Hydrophytic plant species

Record up to 5 hydrophytic plant species (FACW or OBL in the **Arid West** regional wetland plant list) within the assessment area: **within the channel or up to one half-channel width**. Explain in notes if species has an odd distribution (e.g., covers less than 2% of assessment area, long-lived species solely represented by seedlings, or long-lived species solely represented by specimens in decline), or if there is uncertainty about the identification. Enter photo ID, or check if photo is taken.

Check if applicable: ☐ No vegetation in assessment area ☑ No hydrophytes in assessment area

Species	Odd distribution?	Notes	Photo ID

Notes on hydrophytic vegetation:

2 and 3. Aquatic invertebrates

2. How many aquatic invertebrates are quantified in a 15-minute search?

Number of individuals quantified:
☑ None
☐ 1 to 19
☐ 20 +

(Do not count mosquitos)

Photo ID:_____

3. Is there evidence of aquatic stages of EPT (Ephemeroptera, Plecoptera and Trichoptera)?

Yes / No



Ephemeroptera larva
Image credit: Dieter Tracey



Plecoptera larva
Tracey Saxby



Trichoptera larva
Tracey Saxby

Notes on aquatic invertebrates:

4. Algal Cover

Are algae found on the streambed?		Notes on algae cover:	Photo ID:
☐ Check if *all* observed algae appear to be deposited from an upstream source.	☑ Not detected ☐ Yes, < 10% cover ☐ Yes, ≥ 10% (check Yes in single indicator below)		

5. Are single indicators observed?

Indicator	Present	Notes	Photo ID
Fish	☐ Yes ☑ No, no fish ☐ No, only non-native mosquitofish		
Algae cover ≥ 10%	☐ Yes ☑ No		

Supplemental information E.g., aquatic or semi-aquatic amphibians, snakes, or turtles; iron-oxidizing bacteria and fungi; etc.

Dry, sandy wash.

Photo log

Indicate if any other photos taken during the assessment

Photo ID	Description
In Field Maps	

Additional notes about the assessment:

Classification: Ephemeral

1. Hydrophytic plant species	2. Aquatic invertebrates	3. EPT taxa	4. Algae	5. Single indicators • fish present • algae cover ≥ 10%	Classification
None	None	Absent	Absent	Absent	**Ephemeral**
				Present	**At least intermittent**
			Present		**Intermittent**
	Few (1-19)	Absent	Absent	Absent	**Less than Perennial**
				Present	**At least intermittent**
			Present		**At least intermittent**
		Present	Absent		**Intermittent**
			Present		**Perennial**
	Many (20+)	Absent	Absent	Absent	**Ephemeral**
				Present	**At least intermittent**
			Present	Absent	**Ephemeral**
				Present	**At least intermittent**
		Present			**Intermittent**
Few (1-2)	None				**Intermittent**
	Few (1-19)	Absent			**Intermittent**
		Present	Absent		**Intermittent**
			Present		**Perennial**
	Many (20+)	Absent			**Intermittent**
		Present	Absent		**Perennial**
			Present		**Intermittent**
Many (3+)	None				**Intermittent**
	Few (1-19)	Absent	Absent		**Intermittent**
			Present		**Perennial**
		Present			**Perennial**
	Many (20+)				**Perennial**

Shading provided to enhance readability by increasing the contrast between neighboring cells; empty cells indicate the classification will not change with additional information however it is recommended that all five indicators be measured and recorded during every assessment.

MESA-T-01

Episodic Stream Indicator Data Sheet

ID: 29 Palms Solar	Stream ID: MESA-T-01		Date: 10/17/24
Nearest Town: 29 Palms		County: San Bernardino	
Investigators: B. Schultz, C. Amoaku			

Base Map

Aerial Photo #:	Date:	Topographic Map Name:	Date:

GPS Data

GPS Name:	Datum:	Transect Elevation:	Zone 10 / 11	GPS Error: ± ft / m
GPS co-ords start of transect:		GPS co-ords end of transect:		

Geomorphic Province (✓one)	✓ Mojave	Sonoran/Colorado	Great Basin	Other:

Landform (✓ all that apply)

	Headwater		Upper fan	✓ Middle fan		Lower fan		Alluvial plain		Axial valley		Playa

Channel Form (✓ one)

✓ Single thread		Braided		Compound		Distributary		Discontinuous	Other:

Transect was selected to:

✓	Document fluvial activity & boundaries		Document channel elevations & boundaries
	Document habitat associations		Document a change in watercourse morphology
	Other:		

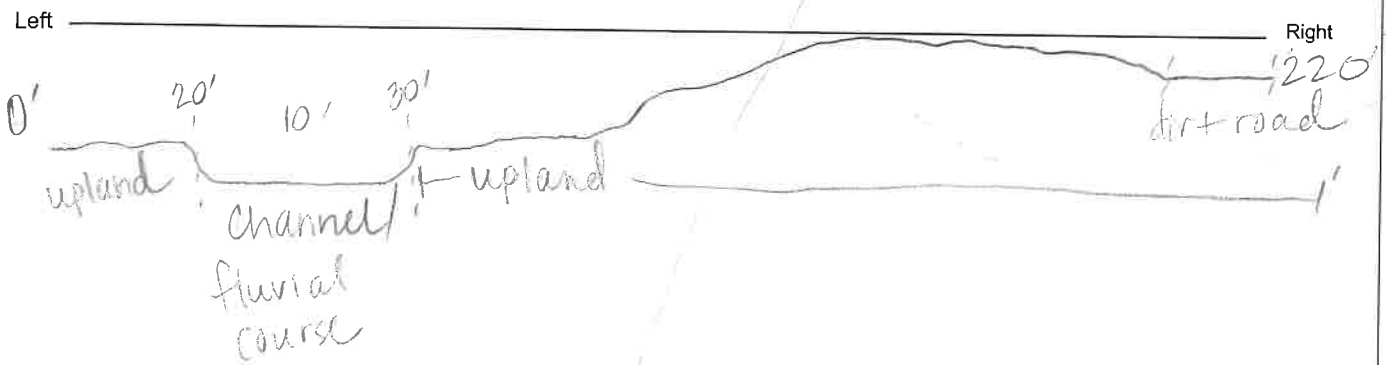
Date of most recent runoff event (if known):

Physical Setting: Briefly describe geomorphic processes and surficial materials and conditions, including the degree of disturbance relative to an intact dryland stream ecosystem, and any anthropogenic influences on the channel form and function:

Stream channel receives runoff from surrounding hillsides. Soil in channel disturbed by OHV use.

Summary Site Description and Cross-section Sketch: View across the channel from watercourse-edge to watercourse-edge. Identify channel(s), banks, islands, interfluves, floodplains, terraces, and uplands where present. Note approximate width and elevation differences between features indicated.

Facing North



Site ID: 29 Palms	Stream ID: MESA-T-01	page 2 of 4

Note presence or absence of each indicator within a minimum distance of 50 feet upstream and 50 feet downstream of the representative channel cross section. Mark each box with a plus (+) for those indicators observed, and a minus (–) for indicators not observed. For examples see the Photo Atlas in MESA ~ Mapping Episodic Stream Indicators.

UPLAND

Terrestrial Indicators

	Av soil horizon	✓	Relict bars & swales
	Biotic soil crusts		Rock fractured in place
✓	Bioturbation	✓	Rock varnish
	Caliche: coatings / layers / rubble		Rock weathering
	Carbonate etching		Rubified rock undersides
	Coppice dunes: active / relict		Soil development
	Deflated surface		Surface rounding of landform
	Pavement	✓	Woody debris in place
	Other:		

Substrate Particle Size

Estimated percentages

	% Bedrock / Cemented substrate	
50	% Boulder	≥ 256 mm
30	% Cobble	≥ 64 – 256mm
5	% Pebble	≥ 4 – 64 mm
5	% Granule	≥ 2 – 4 mm
5	% Sand	≤ 2 mm
5	% Silt/Clay	Fines

Indicators of areas depicted as "upland" on cross section.

Fluvial Indicators

	Bars: sand / gravel		Mud: cracks / curls / drapes		Sediment tails: sand / gravel
	Cut banks		Organic drift		Vegetation-channel alignment
	Drainage swales		Overturned rocks		Water-cut benches
	Exposed roots	✓	Scour		Wrack
	First-order streams		Sediment ramps: sand / gravel		Wrinkle marks
	Flow lineations		Sediment sorting		
	Other:				

Some scour/rills in the hills east of Channel that do not exhibit consistent fluvial indicators indicative of normal flow.

Vegetation

Estimated % perennial plant cover: 5-25% Perennial plant size compared to watercourse veg: smaller / same / larger

Estimate species composition of shrubs and perennial plants by % of total:

Creosote, Ambrosia spp., and Cylindropuntia spp are throughout upland areas and absent from watercourse.

Site ID: 29 Palms	Stream ID: MESA - T-01	page 3 of 4

Note presence or absence of each indicator within a minimum distance of 50 feet upstream and 50 feet downstream of a representative channel cross section. Mark each box with a plus (+) for those indicators observed, and a minus (–) for those not observed. For examples see the Photo Atlas in MESA ~ Mapping Episodic Stream Indicators.

WATERCOURSE or WATERCOURSE COMPLEX

Transportation, Deposition & Flow Transition Indicators

	Bar forms: sand / gravel		Secondary channels
	Bifurcated flow		Sediment plastering
	Drainage swales		Sediment ramps: sand / gravel
	Flow lineations		Sediment sheets: sand / gravel
	Imbricated gravel	✓	Sediment sorting
	Levee ridges: sand / gravel		Sediment tails: sand / gravel
	Mud: cracks / curls / drapes	✓	Vegetation-channel alignments
	Organic drift		Wrack
	Overturned rocks		Wrinkle marks
	Out-of-channel flow: Lateral floodplain / Terminal floodplain		
	Ripples		
	Other:		

Substrate Particle Size

Estimated percentages

5	% Bedrock / Cemented substrate	
5	% Boulder	≥ 256 mm
5	% Cobble	≥ 64 – 256 mm
20	% Pebble	≥ 4 – 64 mm
20	% Granule	≥ 2 – 4 mm
40	% Sand	≤ 2 mm
5	% Silt/Clay	Fines

Indicators in watercourse.

Erosion Indicators

✓	Cut banks		Rills		Water-cut benches
	Exposed roots		Scour		Water level mark
	Headcuts		Secondary channels		
	Other:				

Shelving inconsistent b/c used as road.

Vegetation

Estimated % perennial plant cover: 0

Perennial plant size relative to uplands vegetation: smaller / same / larger

Estimate species composition of perennial plants by % of total:

no perennial plants in channel.

INDICATORS of PONDING & EVAPORATION and EOLIAN TRANSPORT & DEPOSITION

	Algal crusts		Sand-filled channels		
	Beach ridges		Springs		
	Coppice dunes: active / relict		Substrate staining		
	Crusts: carbonate / salt / soda		Vegetation-landscape alignments		
	Mud: cracks / curls / polygons				
	Other:				

none.

Site ID 29 palms	Stream ID MESA-T-01	page 4 of 4

Diagrams and Notes

Photographs

Photographs should document the representative landscape units, vegetation, and the presence or absence of representative stream indicators.

Photo ID #	Description	GPS location	
In Field maps			

MESA-T-02

Episodic Stream Indicator Data Sheet				page 1 of 4
Site ID: 29 Palms	Stream ID: MESA-T-02			Date: 6-17-24
Nearest Town: 29 Palms		County: San Bernardino		
Investigators: B. Strittmatter, C. Amoaku				

Base Map

Aerial Photo #:	Date:	Topographic Map Name:	Date:

GPS Data

GPS Name:	Datum:	Transect Elevation:	Zone 10 / 11	GPS Error: ± ft / m
GPS co-ords start of transect:		GPS co-ords end of transect:		

Geomorphic Province (✓one)	✓ Mojave	Sonoran/Colorado	Great Basin	Other:

Landform (✓ all that apply)

Headwater	Upper fan	✓ Middle fan	Lower fan	Alluvial plain	Axial valley	Playa

Channel Form (✓ one)

Single thread	✓ Braided	Compound	Distributary	Discontinuous	Other:

Transect was selected to:

✓ Document fluvial activity & boundaries	Document channel elevations & boundaries
Document habitat associations	Document a change in watercourse morphology
Other:	

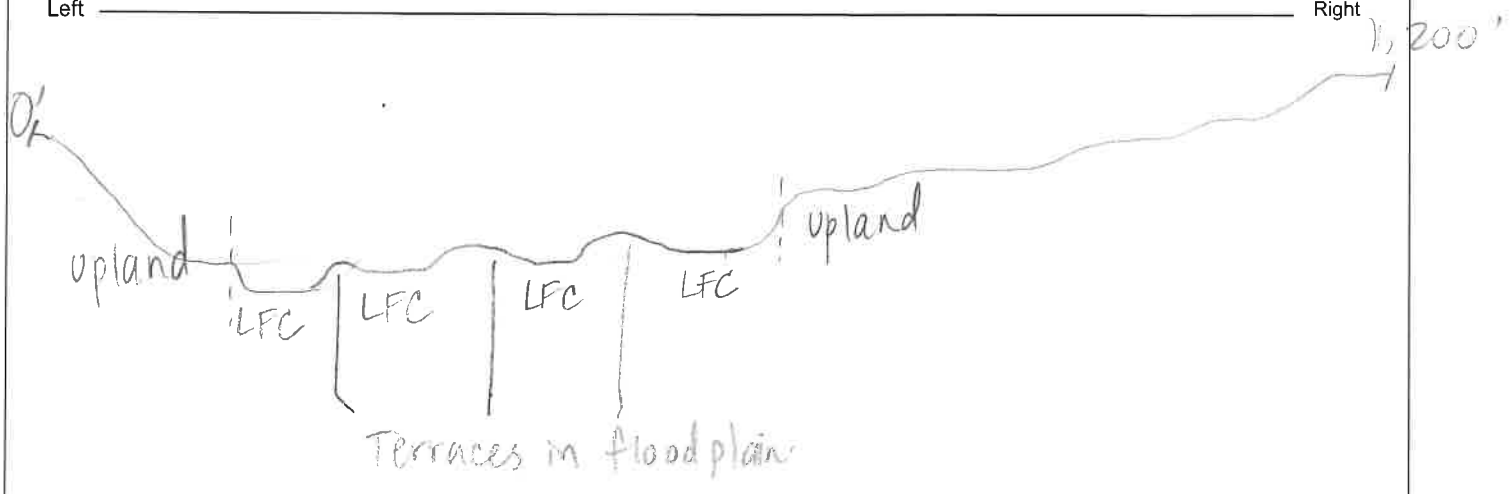
Date of most recent runoff event (if known):

Physical Setting: Briefly describe geomorphic processes and surficial materials and conditions, including the degree of disturbance relative to an intact dryland stream ecosystem, and any anthropogenic influences on the channel form and function:

Braided channel complex w/ low flow channels and terraces. Low flow channels have OHV use.

Summary Site Description and Cross-section Sketch: View across the channel from watercourse-edge to watercourse-edge. Identify channel(s), banks, islands, interfluves, floodplains, terraces, and uplands where present. Note approximate width and elevation differences between features indicated.

Facing E



Site ID: 29 Palms	Stream ID: MESA-T-02	page 2 of 4

Note presence or absence of each indicator within a minimum distance of 50 feet upstream and 50 feet downstream of the representative channel cross section. Mark each box with a plus (+) for those indicators observed, and a minus (–) for indicators not observed. For examples see the Photo Atlas in MESA ~ Mapping Episodic Stream Indicators.

UPLAND

Terrestrial Indicators				**Substrate Particle Size**		
	Av soil horizon	✓	Relict bars & swales	Estimated percentages		
	Biotic soil crusts		**Rock fractured in place**	10	% Bedrock / Cemented substrate	
✓	Bioturbation		Rock varnish	10	% Boulder	≥ 256 mm
	Caliche: coatings / layers / rubble		**Rock weathering**	20	% Cobble	≥ 64 – 256mm
	Carbonate etching		Rubified rock undersides	10	% Pebble	≥ 4 – 64 mm
	Coppice dunes: active / relict		**Soil development**	10	% Granule	≥ 2 – 4 mm
	Deflated surface	✓	Surface rounding of landform	30	% Sand	≤ 2 mm
	Pavement	✓	**Woody debris in place**	10	% Silt/Clay	Fines
	Other:					

Indicators in areas marked as "upland" on cross section.

Fluvial Indicators

	Bars: sand / gravel		**Mud: cracks / curls / drapes**		**Sediment tails: sand / gravel**
✓	Cut banks		Organic drift		Vegetation-channel alignment
	Drainage swales		**Overturned rocks**		**Water-cut benches**
	Exposed roots		Scour		Wrack
	First-order streams		**Sediment ramps: sand / gravel**		**Wrinkle marks**
	Flow lineations		Sediment sorting		
	Other:				

Some relict swales w/ no signs of recent flows and no connection to main channel.

Vegetation

Estimated % perennial plant cover 5-25 | Perennial plant size compared to watercourse veg: smaller / same / larger

Estimate species composition of shrubs and perennial plants by % of total:

Creosote, Ambrosia spp., Senna armata

Schismus + other herbs undisturbed in upland areas.

Site ID: 29 Palms	Stream ID: MESA-T-02	page 3 of 4

Note presence or absence of each indicator within a minimum distance of 50 feet upstream and 50 feet downstream of a representative channel cross section. Mark each box with a plus (+) for those indicators observed, and a minus (–) for those not observed. For examples see the Photo Atlas in MESA ~ Mapping Episodic Stream Indicators.

WATERCOURSE or WATERCOURSE COMPLEX

Transportation, Deposition & Flow Transition Indicators

	Bar forms: sand / gravel		Secondary channels	Substrate Particle Size			
	Bifurcated flow		Sediment plastering	Estimated percentages			
	Drainage swales		Sediment ramps: sand / gravel		% Bedrock / Cemented substrate		
	Flow lineations		Sediment sheets: sand / gravel	10	% Boulder	≥ 256 mm	
	Imbricated gravel	✓	Sediment sorting	10	% Cobble	≥ 64 – 256 mm	
	Levee ridges: sand / gravel		Sediment tails: sand / gravel	10	% Pebble	≥ 4 – 64 mm	
	Mud: cracks / curls / drapes	✓	Vegetation-channel alignments	40	% Sand	≤ 2 mm	
✓	Organic drift	✓	Wrack	20	% Silt/Clay	Fines	
	Overturned rocks		Wrinkle marks				
	Out-of-channel flow: Lateral floodplain / Terminal floodplain						
	Ripples						
	Other:						

Some indicators disturbed from OHV use. Terraces between low flow channels lack indicators.

Erosion Indicators

✓	Cut banks		Rills		Water-cut benches
	Exposed roots		Scour		Water level mark
	Headcuts		Secondary channels		
	Other:				

Shelving more prominent on northern LFCs.

Vegetation

Estimated % perennial plant cover: 5	Perennial plant size relative to uplands vegetation: smaller / same / larger

Estimate species composition of perennial plants by % of total:

PSOspi absent from low flow channels and present on terraces in floodplain.

INDICATORS of PONDING & EVAPORATION and EOLIAN TRANSPORT & DEPOSITION

	Algal crusts		Sand-filled channels		
	Beach ridges		Springs		
	Coppice dunes: active / relict		Substrate staining		
	Crusts: carbonate / salt / soda		Vegetation-landscape alignments		
	Mud: cracks / curls / polygons				
	Other:				

None

Site ID 29 Palms	Stream ID MESA-T-02	page 4 of 4

Diagrams and Notes

Photographs

Photographs should document the representative landscape units, vegetation, and the presence or absence of representative stream indicators.

Photo ID #	Description	GPS location	
	Field maps		

MESA-T-03

Episodic Stream Indicator Data Sheet

Site ID: 29 Palms | Stream ID: MESA-T-03 | Date: 6-17-24

Nearest Town: 29 Palms | County: San Bernardino

Investigators: C. Amoaku, B. Strittmater

Base Map

Aerial Photo #: | Date: | Topographic Map Name: | Date:

GPS Data

GPS Name: | Datum: | Transect Elevation: | Zone 10 / 11 | GPS Error: ± ft / m

GPS co-ords start of transect: | GPS co-ords end of transect:

Geomorphic Province (✓one)

	✓	Mojave		Sonoran/Colorado		Great Basin	Other:		

Landform (✓ all that apply)

	Headwater		Upper fan	✓	Middle fan		Lower fan		Alluvial plain		Axial valley		Playa		

Channel Form (✓ one)

✓	Single thread		Braided		Compound		Distributary		Discontinuous	Other:	

Transect was selected to:

✓	Document fluvial activity & boundaries		Document channel elevations & boundaries
	Document habitat associations		Document a change in watercourse morphology
	Other:		

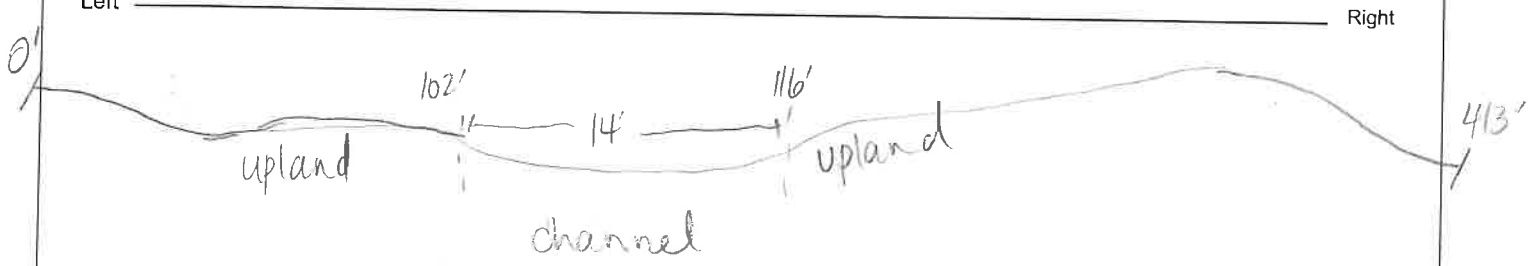
Date of most recent runoff event (if known):

Physical Setting: Briefly describe geomorphic processes and surficial materials and conditions, including the degree of disturbance relative to an intact dryland stream ecosystem, and any anthropogenic influences on the channel form and function:

Single thread channel that connects to the main northern channel. Currently used for OHV activity.

Summary Site Description and Cross-section Sketch: View across the channel from watercourse-edge to watercourse-edge. Identify channel(s), banks, islands, interfluves, floodplains, terraces, and uplands where present. Note approximate width and elevation differences between features indicated.

facing NW



Site ID: 29 Palms	Stream ID: MESA - T-03	page 2 of 4

Note presence or absence of each indicator within a minimum distance of 50 feet upstream and 50 feet downstream of the representative channel cross section. Mark each box with a plus (+) for those indicators observed, and a minus (–) for indicators not observed. For examples see the Photo Atlas in MESA ~ Mapping Episodic Stream Indicators.

UPLAND

Terrestrial Indicators

	Av soil horizon	✓	Relict bars & swales
	Biotic soil crusts		Rock fractured in place
✓	Bioturbation		Rock varnish
	Caliche: coatings / layers / rubble		Rock weathering
	Carbonate etching		Rubified rock undersides
	Coppice dunes: active / relict		Soil development
	Deflated surface	✓	Surface rounding of landform
	Pavement	✓	Woody debris in place
	Other:		

Substrate Particle Size

Estimated percentages

	% Bedrock / Cemented substrate	
10	% Boulder	≥ 256 mm
20	% Cobble	≥ 64 – 256mm
20	% Pebble	≥ 4 – 64 mm
20	% Granule	≥ 2 – 4 mm
20	% Sand	≤ 2 mm
10	% Silt/Clay	Fines

Fluvial Indicators

	Bars: sand / gravel		Mud: cracks / curls / drapes		Sediment tails: sand / gravel
	Cut banks		Organic drift		Vegetation-channel alignment
✓	Drainage swales		Overturned rocks		Water-cut benches
	Exposed roots		Scour		Wrack
	First-order streams		Sediment ramps: sand / gravel		Wrinkle marks
	Flow lineations		Sediment sorting		
	Other:				

upland relic swale

Vegetation

Estimated % perennial plant cover: 15-25 | Perennial plant size compared to watercourse veg: smaller / same / (larger)

Estimate species composition of shrubs and perennial plants by % of total:

Creosote, Cholla, Ambrosia spp. in upland areas. Absent from water course. Relict swales observed on western side of transect between slopes.

Site ID: 29 Palms	Stream ID: MESA-T-03	page 3 of 4

Note presence or absence of each indicator within a minimum distance of 50 feet upstream and 50 feet downstream of a representative channel cross section. Mark each box with a plus (+) for those indicators observed, and a minus (–) for those not observed. For examples see the Photo Atlas in MESA ~ Mapping Episodic Stream Indicators.

WATERCOURSE or WATERCOURSE COMPLEX

Transportation, Deposition & Flow Transition Indicators

	Bar forms: sand / gravel		Secondary channels
	Bifurcated flow		Sediment plastering
	Drainage swales		Sediment ramps: sand / gravel
	Flow lineations		Sediment sheets: sand / gravel
	Imbricated gravel	✓	Sediment sorting
	Levee ridges: sand / gravel		Sediment tails: sand / gravel
	Mud: cracks / curls / drapes	✓	Vegetation-channel alignments
	Organic drift		Wrack
	Overturned rocks		Wrinkle marks
	Out-of-channel flow: Lateral floodplain / Terminal floodplain		
	Ripples		
	Other:		

Substrate Particle Size

Estimated percentages

	% Bedrock / Cemented substrate	
5	% Boulder	≥ 256 mm
5	% Cobble	≥ 64 – 256 mm
10	% Pebble	≥ 4 – 64 mm
20	% Granule	≥ 2 – 4 mm
40	% Sand	≤ 2 mm
20	% Silt/Clay	Fines

Most indicators disturbed from OHV use.

Erosion Indicators

✓	Cut banks		Rills		Water-cut benches
	Exposed roots		Scour		Water level mark
	Headcuts		Secondary channels		
	Other:				

Vegetation

Estimated % perennial plant cover: 0

Perennial plant size relative to uplands vegetation: smaller / same / larger

Estimate species composition of perennial plants by % of total:

Perennial plant absent from channel.

INDICATORS of PONDING & EVAPORATION and EOLIAN TRANSPORT & DEPOSITION

	Algal crusts		Sand-filled channels		
	Beach ridges		Springs		
	Coppice dunes: active / relict		Substrate staining		
	Crusts: carbonate / salt / soda		Vegetation-landscape alignments		
	Mud: cracks / curls / polygons				
	Other:				

None

Site ID	Stream ID	page 4 of 4

Diagrams and Notes

Photographs

Photographs should document the representative landscape units, vegetation, and the presence or absence of representative stream indicators.

Photo ID #	Description	GPS location	

Episodic Stream Indicator Data Sheet				page 1 of 4
Site ID: 29 Palms	Stream ID: MESA-T-04			Date: 6/17/24
Nearest Town: 29 Palms		County:		
Investigators: B. Schultz, C. Amoaku				
Base Map				
Aerial Photo #:	Date:	Topographic Map Name:		Date:
GPS Data				
GPS Name:	Datum:	Transect Elevation:	Zone 10 / 11	GPS Error: ± ft / m
GPS co-ords start of transect:		GPS co-ords end of transect:		

Geomorphic Province (✓one)		Mojave		Sonoran/Colorado		Great Basin	Other:

Landform (✓ all that apply)

	Headwater		Upper fan		Middle fan	✓	Lower fan		Alluvial plain		Axial valley		Playa

Channel Form (✓ one)

	Single thread		Braided		Compound		Distributary		Discontinuous	Other:

Transect was selected to:

✓	Document fluvial activity & boundaries		Document channel elevations & boundaries
	Document habitat associations		Document a change in watercourse morphology
	Other:		

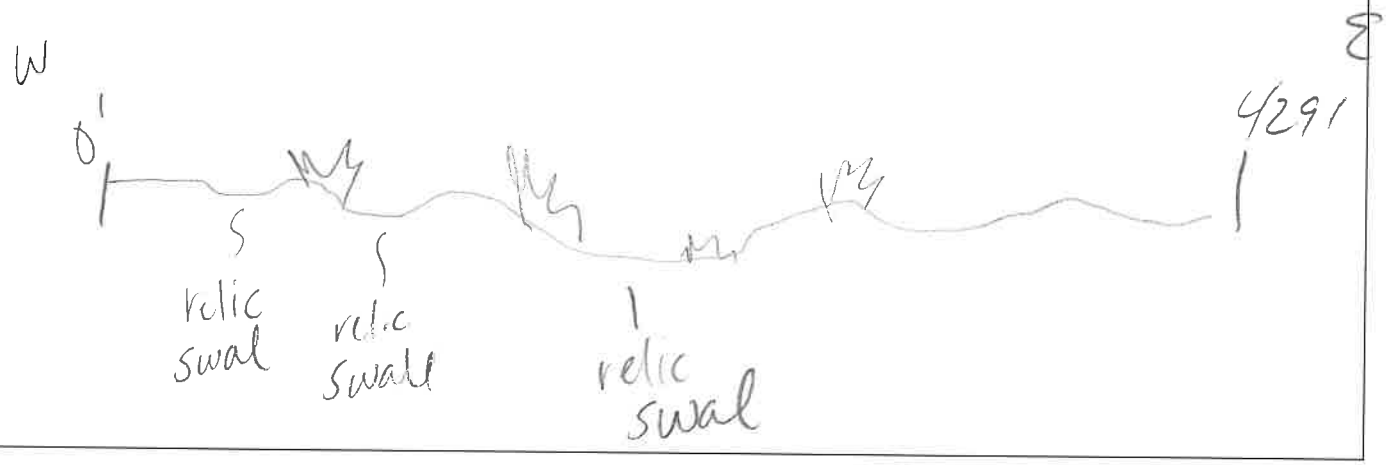
Date of most recent runoff event (if known):

Physical Setting: Briefly describe geomorphic processes and surficial materials and conditions, including the degree of disturbance relative to an intact dryland stream ecosystem, and any anthropogenic influences on the channel form and function:

Sheetflow influenced and relic swales present throughout. No recent fluvial activity (only relic alluvium scaring of landscape of past historical flows)

Summary Site Description and Cross-section Sketch: View across the channel from watercourse-edge to watercourse-edge. Identify channel(s), banks, islands, interfluves, floodplains, terraces, and uplands where present. Note approximate width and elevation differences between features indicated.

Left ——— Facing North ——— Right



Site ID: 29 Palms	Stream ID: MESA-T-04	page 2 of 4

Note presence or absence of each indicator within a minimum distance of 50 feet upstream and 50 feet downstream of the representative channel cross section. Mark each box with a plus (+) for those indicators observed, and a minus (–) for indicators not observed. For examples see the Photo Atlas in MESA ~ Mapping Episodic Stream Indicators.

UPLAND

Terrestrial Indicators				Substrate Particle Size		
	Av soil horizon	✓	Relict bars & swales	Estimated percentages		
	Biotic soil crusts		Rock fractured in place		% Bedrock / Cemented substrate	
✓	Bioturbation		Rock varnish	20	% Boulder	≥ 256 mm
	Caliche: coatings / layers / rubble		Rock weathering	20	% Cobble	≥ 64 – 256mm
	Carbonate etching		Rubified rock undersides	20	% Pebble	≥ 4 – 64 mm
	Coppice dunes: active / relict	✓	Soil development	10	% Granule	≥ 2 – 4 mm
	Deflated surface	✓	Surface rounding of landform	20	% Sand	≤ 2 mm
	Pavement	✓	Woody debris in place		% Silt/Clay	Fines
✓	Other: rocks in swales					

Fluvial Indicators

	Bars: sand / gravel		Mud: cracks / curls / drapes		Sediment tails: sand / gravel
✓	Cut banks		Organic drift		Vegetation-channel alignment
✓	Drainage swales		Overturned rocks		Water-cut benches
	Exposed roots	✓	Scour		Wrack
	First-order streams		Sediment ramps: sand / gravel		Wrinkle marks
	Flow lineations		Sediment sorting		
	Other:				

Relic swales throughout w/ discontinuous indicators – no signs of recent hydrology / fluvial activity

Vegetation

Estimated % perennial plant cover: 10-15 Perennial plant size compared to watercourse veg: smaller / same / larger

Estimate species composition of shrubs and perennial plants by % of total:

creosote, burrobush, big galleta, cholla

Site ID: 29 Palms	Stream ID: MESA-T-04	page 3 of 4

Note presence or absence of each indicator within a minimum distance of 50 feet upstream and 50 feet downstream of a representative channel cross section. Mark each box with a plus (+) for those indicators observed, and a minus (–) for those not observed. For examples see the Photo Atlas in MESA ~ Mapping Episodic Stream Indicators.

WATERCOURSE or WATERCOURSE COMPLEX

Transportation, Deposition & Flow Transition Indicators

	Bar forms: sand / gravel		Secondary channels
	Bifurcated flow		Sediment plastering
	Drainage swales		Sediment ramps: sand / gravel
	Flow lineations		Sediment sheets: sand / gravel
	Imbricated gravel		Sediment sorting
	Levee ridges: sand / gravel		Sediment tails: sand / gravel
	Mud: cracks / curls / drapes		Vegetation-channel alignments
	Organic drift		Wrack
	Overturned rocks		Wrinkle marks
	Out-of-channel flow: Lateral floodplain / Terminal floodplain		
	Ripples		
	Other:		

Substrate Particle Size

Estimated percentages

	% Bedrock / Cemented substrate	
	% Boulder	≥ 256 mm
	% Cobble	≥ 64 – 256 mm
	% Pebble	≥ 4 – 64 mm
	% Granule	≥ 2 – 4 mm
	% Sand	≤ 2 mm
	% Silt/Clay	Fines

N/A

Erosion Indicators

	Cut banks		Rills		Water-cut benches
	Exposed roots		Scour		Water level mark
	Headcuts		Secondary channels		
	Other:				

N/A

Vegetation

Estimated % perennial plant cover:	Perennial plant size relative to uplands vegetation: smaller / same / larger

Estimate species composition of perennial plants by % of total:

N/A

INDICATORS of PONDING & EVAPORATION and EOLIAN TRANSPORT & DEPOSITION

	Algal crusts		Sand-filled channels		
	Beach ridges		Springs		
	Coppice dunes: active / relict		Substrate staining		
	Crusts: carbonate / salt / soda		Vegetation-landscape alignments		
	Mud: cracks / curls / polygons				
	Other:				

none

Site ID	Stream ID	page 4 of 4

Diagrams and Notes

Photographs

Photographs should document the representative landscape units, vegetation, and the presence or absence of representative stream indicators.

Photo ID #	Description	GPS location	

MESA-T-05

Episodic Stream Indicator Data Sheet				page 1 of 4
Site ID: 29 Palms	Stream ID: MESA-T-05			Date: 6-17-24
Nearest Town: 29 Palms			County: San Bernardino	
Investigators: B. Schultz, C. Amoakue				
Base Map				
Aerial Photo #:	Date:	Topographic Map Name:		Date:
GPS Data				
GPS Name:	Datum:	Transect Elevation:	Zone 10 / 11	GPS Error: ± ft / m
GPS co-ords start of transect:		GPS co-ords end of transect:		

Geomorphic Province (✓one)											
	✓	Mojave		Sonoran/Colorado		Great Basin	Other:				

Landform (✓ all that apply)													
	Headwater		Upper fan	✓	Middle fan		Lower fan		Alluvial plain		Axial valley		Playa

Channel Form (✓ one)											
✓	Single thread		Braided		Compound		Distributary		Discontinuous	Other:	

Transect was selected to:			
✓	Document fluvial activity & boundaries		Document channel elevations & boundaries
	Document habitat associations		Document a change in watercourse morphology
	Other:		

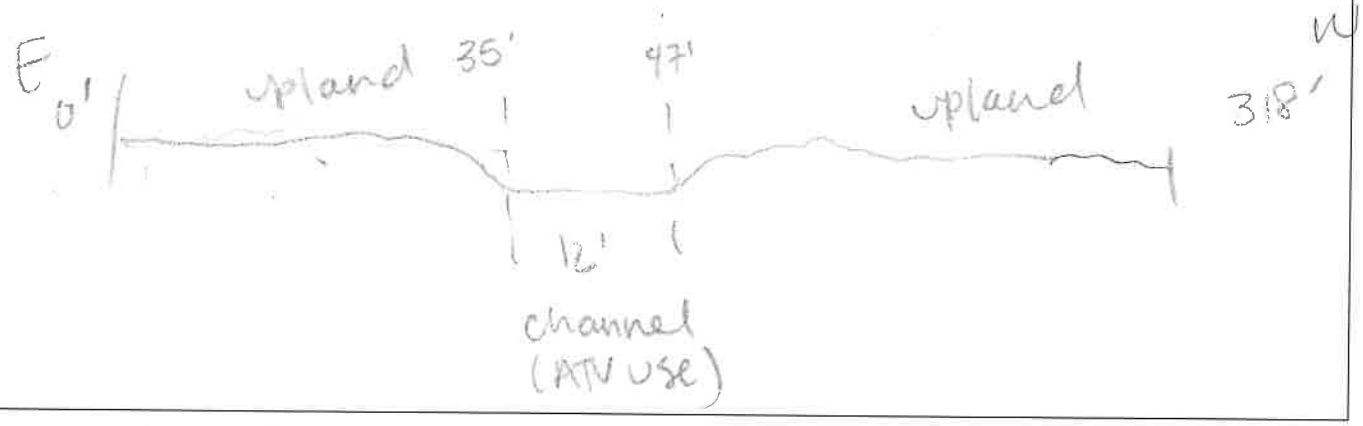
Date of most recent runoff event (if known):

Physical Setting: Briefly describe geomorphic processes and surficial materials and conditions, including the degree of disturbance relative to an intact dryland stream ecosystem, and any anthropogenic influences on the channel form and function:

Single thread channel that connects to main channel to north.

Summary Site Description and Cross-section Sketch: View across the channel from watercourse-edge to watercourse-edge. Identify channel(s), banks, islands, interfluves, floodplains, terraces, and uplands where present. Note approximate width and elevation differences between features indicated.

Left ——— Right



Site ID: 29 Palms	Stream ID: MESA-T-05	page 2 of 4

Note presence or absence of each indicator within a minimum distance of 50 feet upstream and 50 feet downstream of the representative channel cross section. Mark each box with a plus (+) for those indicators observed, and a minus (–) for indicators not observed. For examples see the Photo Atlas in MESA ~ Mapping Episodic Stream Indicators.

UPLAND

Terrestrial Indicators				Substrate Particle Size		
	Av soil horizon	✓	Relict bars & swales	Estimated percentages		
	Biotic soil crusts		Rock fractured in place	–	% Bedrock / Cemented substrate	
	Bioturbation		Rock varnish	10	% Boulder	≥ 256 mm
	Caliche: coatings / layers / rubble		Rock weathering	30	% Cobble	≥ 64 – 256mm
	Carbonate etching		Rubified rock undersides	30	% Pebble	≥ 4 – 64 mm
	Coppice dunes: active / relict		Soil development	20	% Granule	≥ 2 – 4 mm
	Deflated surface	✓	Surface rounding of landform	10	% Sand	≤ 2 mm
	Pavement	✓	Woody debris in place	0	% Silt/Clay	Fines
	Other:					

Fluvial Indicators					
	Bars: sand / gravel		Mud: cracks / curls / drapes		Sediment tails: sand / gravel
	Cut banks		Organic drift		Vegetation-channel alignment
✓	Drainage swales		Overturned rocks		Water-cut benches
	Exposed roots		Scour		Wrack
	First-order streams		Sediment ramps: sand / gravel		Wrinkle marks
	Flow lineations		Sediment sorting		
	Other:				

relic upland swales

Vegetation

Estimated % perennial plant cover: 5-25 | Perennial plant size compared to watercourse veg: smaller / same / larger

Estimate species composition of shrubs and perennial plants by % of total:

creosote, burrobush, big galleta, ephedra in upland areas. relict swales observed in western transect

Site ID: 29 Palms	Stream ID: MESA-T-05	page 3 of 4

Note presence or absence of each indicator within a minimum distance of 50 feet upstream and 50 feet downstream of a representative channel cross section. Mark each box with a plus (+) for those indicators observed, and a minus (–) for those not observed. For examples see the Photo Atlas in MESA ~ Mapping Episodic Stream Indicators.

WATERCOURSE or WATERCOURSE COMPLEX

Transportation, Deposition & Flow Transition Indicators				Substrate Particle Size		
	Bar forms: sand / gravel		Secondary channels	Estimated percentages		
	Bifurcated flow		Sediment plastering		% Bedrock / Cemented substrate	
	Drainage swales		Sediment ramps: sand / gravel		% Boulder	≥ 256 mm
	Flow lineations		Sediment sheets: sand / gravel	10	% Cobble	≥ 64 – 256 mm
	Imbricated gravel	✓	Sediment sorting	10	% Pebble	≥ 4 – 64 mm
	Levee ridges: sand / gravel		Sediment tails: sand / gravel	20	% Granule	≥ 2 – 4 mm
	Mud: cracks / curls / drapes	✓	Vegetation-channel alignments	50	% Sand	≤ 2 mm
	Organic drift		Wrack	10	% Silt/Clay	Fines
	Overturned rocks		Wrinkle marks			
	Out-of-channel flow: Lateral floodplain / Terminal floodplain					
	Ripples					
	Other:					

Erosion Indicators

	Cut banks		Rills		Water-cut benches
	Exposed roots		Scour		Water level mark
	Headcuts		Secondary channels		
	Other:				

none

Vegetation

Estimated % perennial plant cover: 0

Perennial plant size relative to uplands vegetation: smaller / same / larger

Estimate species composition of perennial plants by % of total:

perennial plants absent from channel

INDICATORS of PONDING & EVAPORATION and EOLIAN TRANSPORT & DEPOSITION

	Algal crusts		Sand-filled channels		
	Beach ridges		Springs		
	Coppice dunes: active / relict		Substrate staining		
	Crusts: carbonate / salt / soda		Vegetation-landscape alignments		
	Mud: cracks / curls / polygons				
	Other:				

Site ID	29 palms	Stream ID	MESA-T-05	page 4 of 4

Diagrams and Notes

Photographs

Photographs should document the representative landscape units, vegetation, and the presence or absence of representative stream indicators.

Photo ID #	Description	GPS location	

MESA-T-06

Episodic Stream Indicator Data Sheet			page 1 of 4
Site ID: 29 Palms	Stream ID: MESA-T-06		Date: 9/17/24
Nearest Town: 29 Palms		County:	
Investigators:			

Base Map

Aerial Photo #:	Date:	Topographic Map Name:	Date:

GPS Data

GPS Name:	Datum:	Transect Elevation:	Zone 10 / 11	GPS Error: ± ft / m
GPS co-ords start of transect:		GPS co-ords end of transect:		

Geomorphic Province (✓one)	✓	Mojave		Sonoran/Colorado		Great Basin	Other:

Landform (✓ all that apply)

	Headwater		Upper fan		Middle fan		Lower fan		Alluvial plain		Axial valley		Playa

Channel Form (✓ one)

	Single thread		Braided		Compound		Distributary		Discontinuous	Other:

Transect was selected to:

	Document fluvial activity & boundaries		Document channel elevations & boundaries
	Document habitat associations		Document a change in watercourse morphology
✓	Other: relic swales		

Date of most recent runoff event (if known):

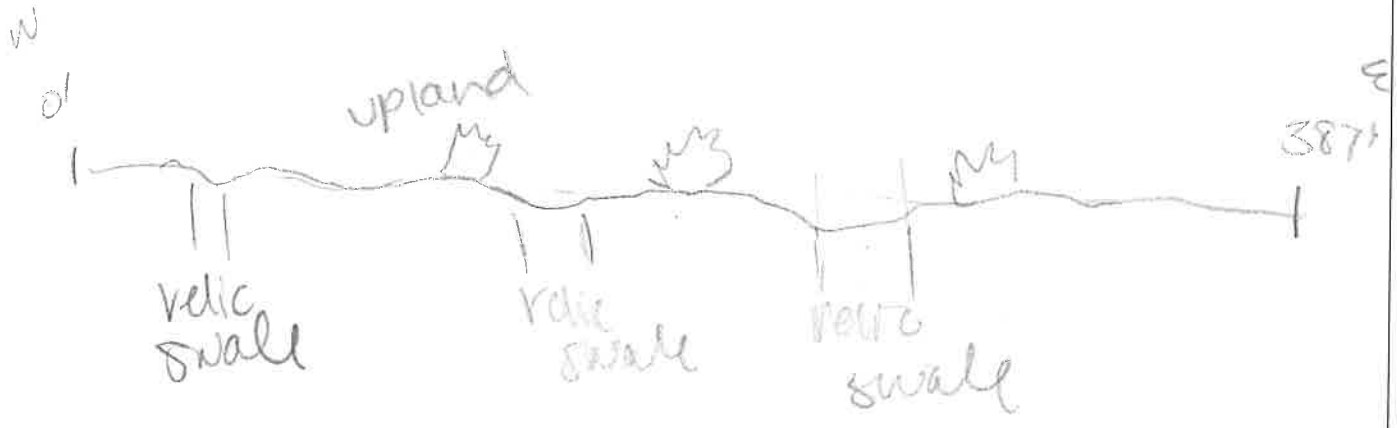
Physical Setting: Briefly describe geomorphic processes and surficial materials and conditions, including the degree of disturbance relative to an intact dryland stream ecosystem, and any anthropogenic influences on the channel form and function:

relic swales throughout

Summary Site Description and Cross-section Sketch: View across the channel from watercourse-edge to watercourse-edge. Identify channel(s), banks, islands, interfluves, floodplains, terraces, and uplands where present. Note approximate width and elevation differences between features indicated.

Facing North

Left ——— Right



Site ID: 29 Palms	Stream ID: MESA-T-06	page 2 of 4

Note presence or absence of each indicator within a minimum distance of 50 feet upstream and 50 feet downstream of the representative channel cross section. Mark each box with a plus (+) for those indicators observed, and a minus (–) for indicators not observed. For examples see the Photo Atlas in MESA ~ Mapping Episodic Stream Indicators.

UPLAND

Terrestrial Indicators				Substrate Particle Size		
	Av soil horizon	✓	Relict bars & swales	Estimated percentages		
	Biotic soil crusts		Rock fractured in place		% Bedrock / Cemented substrate	
✓	Bioturbation		Rock varnish	10	% Boulder	≥ 256 mm
	Caliche: coatings / layers / rubble		Rock weathering	10	% Cobble	≥ 64 – 256mm
	Carbonate etching		Rubified rock undersides	20	% Pebble	≥ 4 – 64 mm
	Coppice dunes: active / relict		Soil development	30	% Granule	≥ 2 – 4 mm
	Deflated surface	✓	Surface rounding of landform	30	% Sand	≤ 2 mm
	Pavement	✓	Woody debris in place	–	% Silt/Clay	Fines
	Other:					

Fluvial Indicators					
	Bars: sand / gravel		Mud: cracks / curls / drapes		Sediment tails: sand / gravel
	Cut banks		Organic drift		Vegetation-channel alignment
✓	Drainage swales		Overturned rocks		Water-cut benches
	Exposed roots		Scour		Wrack
	First-order streams		Sediment ramps: sand / gravel		Wrinkle marks
	Flow lineations		Sediment sorting		
	Other:				

Relic swales throughout but no fluvial activity indicators

Vegetation

Estimated % perennial plant cover:	Perennial plant size compared to watercourse veg: smaller / same / larger

Estimate species composition of shrubs and perennial plants by % of total:

creosote, burrobush, big galleta; cholla

Site ID: 29 Palms	Stream ID: MESA-T-04	page 3 of 4

Note presence or absence of each indicator within a minimum distance of 50 feet upstream and 50 feet downstream of a representative channel cross section. Mark each box with a plus (+) for those indicators observed, and a minus (–) for those not observed. For examples see the Photo Atlas in MESA ~ Mapping Episodic Stream Indicators.

WATERCOURSE or WATERCOURSE COMPLEX

Transportation, Deposition & Flow Transition Indicators

	Bar forms: sand / gravel		Secondary channels
	Bifurcated flow		Sediment plastering
	Drainage swales		Sediment ramps: sand / gravel
	Flow lineations		Sediment sheets: sand / gravel
	Imbricated gravel		Sediment sorting
	Levee ridges: sand / gravel		Sediment tails: sand / gravel
	Mud: cracks / curls / drapes		Vegetation-channel alignments
	Organic drift		Wrack
	Overturned rocks		Wrinkle marks
	Out-of-channel flow: Lateral floodplain / Terminal floodplain		
	Ripples		
	Other:		

Substrate Particle Size

Estimated percentages

	% Bedrock / Cemented substrate	
	% Boulder	≥ 256 mm
	% Cobble	≥ 64 – 256 mm
	% Pebble	≥ 4 – 64 mm
	% Granule	≥ 2 – 4 mm
	% Sand	≤ 2 mm
	% Silt/Clay	Fines

N/A

Erosion Indicators

	Cut banks		Rills		Water-cut benches
	Exposed roots		Scour		Water level mark
	Headcuts		Secondary channels		
	Other:				

N/A

Vegetation

Estimated % perennial plant cover:	Perennial plant size relative to uplands vegetation: smaller / same / larger

Estimate species composition of perennial plants by % of total:

N/A

INDICATORS of PONDING & EVAPORATION and EOLIAN TRANSPORT & DEPOSITION

	Algal crusts		Sand-filled channels		
	Beach ridges		Springs		
	Coppice dunes: active / relict		Substrate staining		
	Crusts: carbonate / salt / soda		Vegetation-landscape alignments		
	Mud: cracks / curls / polygons				
	Other:				

N/A

Site ID 29 Palms	Stream ID MESA-T-06	page 4 of 4

Diagrams and Notes

Photographs

Photographs should document the representative landscape units, vegetation, and the presence or absence of representative stream indicators.

Photo ID #	Description	GPS location	

MESA - T- 07

Episodic Stream Indicator Data Sheet				page 1 of 4
Site ID: 29 Palms	Stream ID: MESA - T - 07			Date: 6 - 17 - 24
Nearest Town: 29 Palms			County: San Bernardino	
Investigators: B. Schultz, C. Amoaku				

Base Map			
Aerial Photo #:	Date:	Topographic Map Name:	Date:

GPS Data				
GPS Name:	Datum:	Transect Elevation:	Zone 10 / 11	GPS Error: ± ft / m
GPS co-ords start of transect:		GPS co-ords end of transect:		

Geomorphic Province (✓one)							
	✓ Mojave		Sonoran/Colorado		Great Basin	Other:	

Landform (✓ all that apply)													
	Headwater		Upper fan		Middle fan	✓	Lower fan		Alluvial plain		Axial valley		Playa

Channel Form (✓ one)									
	Single thread		Braided		Compound		Distributary	✓	Discontinuous	Other:

Transect was selected to:			
✓	Document fluvial activity & boundaries		Document channel elevations & boundaries
	Document habitat associations		Document a change in watercourse morphology
	Other:		

Date of most recent runoff event (if known):

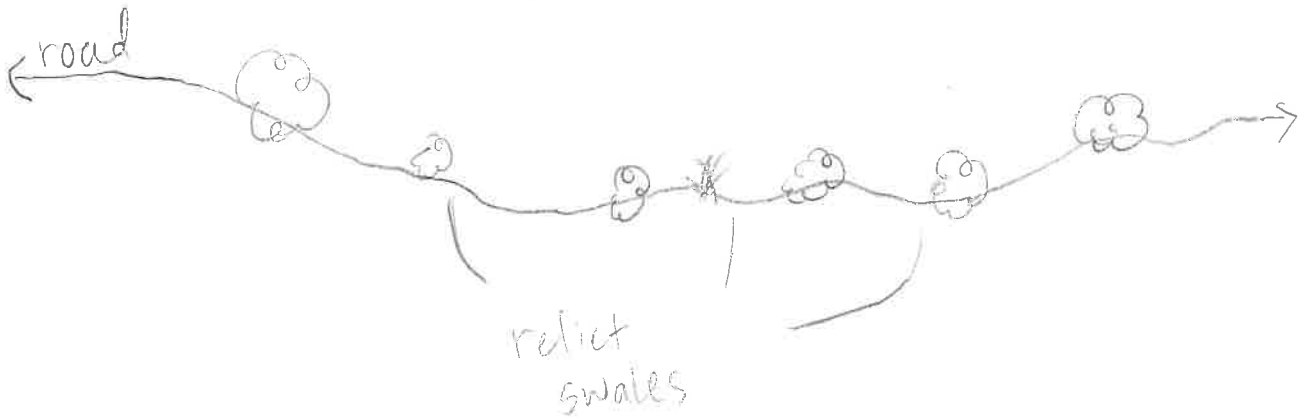
Physical Setting: Briefly describe geomorphic processes and surficial materials and conditions, including the degree of disturbance relative to an intact dryland stream ecosystem, and any anthropogenic influences on the channel form and function:

Alluvial fan north of transect/review area. Sheet-flow influenced, but no watercourse.

Summary Site Description and Cross-section Sketch: View across the channel from watercourse-edge to watercourse-edge. Identify channel(s), banks, islands, interfluves, floodplains, terraces, and uplands where present. Note approximate width and elevation differences between features indicated.

Facing South

Left ——— Right



Site ID: 29 Palms	Stream ID: MESA-T-07	page 2 of 4

Note presence or absence of each indicator within a minimum distance of 50 feet upstream and 50 feet downstream of the representative channel cross section. Mark each box with a plus (+) for those indicators observed, and a minus (–) for indicators not observed. For examples see the Photo Atlas in MESA ~ Mapping Episodic Stream Indicators.

UPLAND

Terrestrial Indicators				**Substrate Particle Size**		
	Av soil horizon	✓	Relict bars & swales	Estimated percentages		
	Biotic soil crusts		Rock fractured in place		% Bedrock / Cemented substrate	
✓	Bioturbation		Rock varnish	25	% Boulder	≥ 256 mm
	Caliche: coatings / layers / rubble		Rock weathering	15	% Cobble	≥ 64 – 256mm
	Carbonate etching		Rubified rock undersides	10	% Pebble	≥ 4 – 64 mm
	Coppice dunes: active / relict		Soil development	10	% Granule	≥ 2 – 4 mm
	Deflated surface	✓	Surface rounding of landform	20	% Sand	≤ 2 mm
	Pavement	✓	Woody debris in place	20	% Silt/Clay	Fines
✓	Other: rocks in swales					

Fluvial Indicators				
	Bars: sand / gravel		Mud: cracks / curls / drapes	Sediment tails: sand / gravel
	Cut banks		Organic drift	Vegetation-channel alignment
✓	Drainage swales		Overturned rocks	Water-cut benches
	Exposed roots	✓	Scour	Wrack
	First-order streams		Sediment ramps: sand / gravel	Wrinkle marks
	Flow lineations		Sediment sorting	
	Other:			

Relict swales w/ discontinuous indicators and no signs of recent fluvial activity

Vegetation

Estimated % perennial plant cover: 15-25 | Perennial plant size compared to watercourse veg: N/A smaller / same / larger

Estimate species composition of shrubs and perennial plants by % of total:

Creosote, Ephedra, Ambrosia, Cholla throughout

Site ID: 29 Palms	Stream ID: MESA-T-07	page 3 of 4

Note presence or absence of each indicator within a minimum distance of 50 feet upstream and 50 feet downstream of a representative channel cross section. Mark each box with a plus (+) for those indicators observed, and a minus (–) for those not observed. For examples see the Photo Atlas in MESA ~ Mapping Episodic Stream Indicators.

WATERCOURSE or WATERCOURSE COMPLEX

Transportation, Deposition & Flow Transition Indicators

	Bar forms: sand / gravel		Secondary channels
	Bifurcated flow		Sediment plastering
	Drainage swales		Sediment ramps: sand / gravel
	Flow lineations		Sediment sheets: sand / gravel
	Imbricated gravel		Sediment sorting
	Levee ridges: sand / gravel		Sediment tails: sand / gravel
	Mud: cracks / curls / drapes		Vegetation-channel alignments
	Organic drift		Wrack
	Overturned rocks		Wrinkle marks
	Out-of-channel flow: Lateral floodplain / Terminal floodplain		
	Ripples		
	Other:		

Substrate Particle Size

Estimated percentages	
% Bedrock / Cemented substrate	
% Boulder	≥ 256 mm
% Cobble	≥ 64 – 256 mm
% Pebble	≥ 4 – 64 mm
% Granule	≥ 2 – 4 mm
% Sand	≤ 2 mm
% Silt/Clay	Fines

N/A

Erosion Indicators

	Cut banks	Rills	Water-cut benches
	Exposed roots	Scour	Water level mark
	Headcuts	Secondary channels	
	Other:		

N/A

Vegetation

Estimated % perennial plant cover:	Perennial plant size relative to uplands vegetation: smaller / same / larger

Estimate species composition of perennial plants by % of total:

N/A

INDICATORS of PONDING & EVAPORATION and EOLIAN TRANSPORT & DEPOSITION

	Algal crusts	Sand-filled channels	
	Beach ridges	Springs	
	Coppice dunes: active / relict	Substrate staining	
	Crusts: carbonate / salt / soda	Vegetation-landscape alignments	
	Mud: cracks / curls / polygons		
	Other:		

none

Site ID	Stream ID	page 4 of 4

Diagrams and Notes

Photographs

Photographs should document the representative landscape units, vegetation, and the presence or absence of representative stream indicators.

Photo ID #	Description	GPS location	

MESA -T- 08

Episodic Stream Indicator Data Sheet			page 1 of 4
Site ID: 29 Palms	Stream ID: MESA-T-08		Date: 6-17-24
Nearest Town: 29 Palms		County: San Bernardino	
Investigators: B. Schultz, C. Amoaku			

Base Map

Aerial Photo #:	Date:	Topographic Map Name:	Date:

GPS Data

GPS Name:	Datum:	Transect Elevation:	Zone 10 / 11	GPS Error: ± ft / m
GPS co-ords start of transect:		GPS co-ords end of transect:		

Geomorphic Province (✓one)	✓	Mojave		Sonoran/Colorado		Great Basin	Other:

Landform (✓ all that apply)

	Headwater		Upper fan	✓	Middle fan		Lower fan		Alluvial plain		Axial valley		Playa

Channel Form (✓ one)

✓	Single thread		Braided		Compound		Distributary		Discontinuous	Other:

Transect was selected to:

✓	Document fluvial activity & boundaries		Document channel elevations & boundaries
	Document habitat associations		Document a change in watercourse morphology
	Other:		

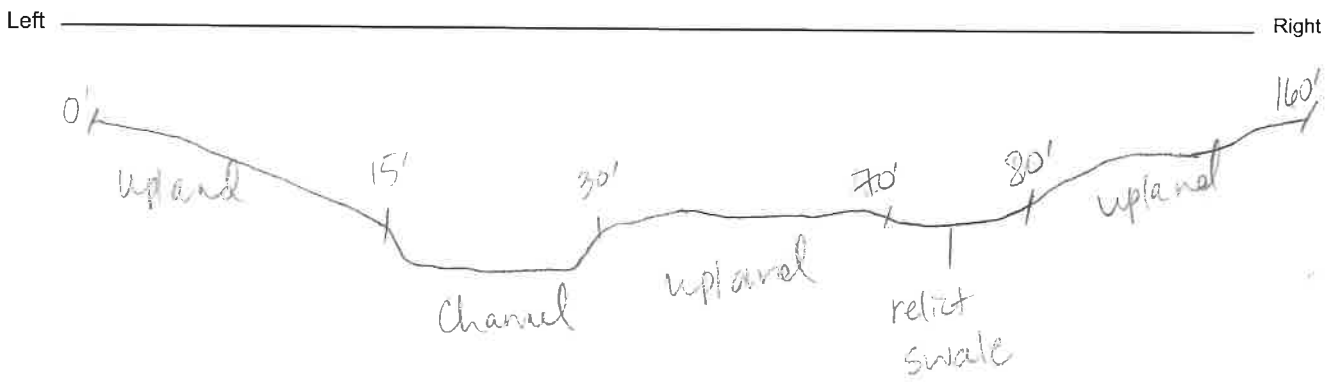
Date of most recent runoff event (if known):

Physical Setting: Briefly describe geomorphic processes and surficial materials and conditions, including the degree of disturbance relative to an intact dryland stream ecosystem, and any anthropogenic influences on the channel form and function:

Channel used as OHV. Sheetflow influenced.

Summary Site Description and Cross-section Sketch: View across the channel from watercourse-edge to watercourse-edge. Identify channel(s), banks, islands, interfluves, floodplains, terraces, and uplands where present. Note approximate width and elevation differences between features indicated.

Facing NE



Site ID: 29 Palms	Stream ID: MESA -T-08	page 2 of 4

Note presence or absence of each indicator within a minimum distance of 50 feet upstream and 50 feet downstream of the representative channel cross section. Mark each box with a plus (+) for those indicators observed, and a minus (–) for indicators not observed. For examples see the Photo Atlas in MESA ~ Mapping Episodic Stream Indicators.

UPLAND

Terrestrial Indicators				**Substrate Particle Size**	
	Av soil horizon	✓	Relict bars & swales	Estimated percentages	
	Biotic soil crusts		Rock fractured in place	% Bedrock / Cemented substrate	
	Bioturbation	✓	Rock varnish	% Boulder	≥ 256 mm
	Caliche: coatings / layers / rubble		Rock weathering	% Cobble	≥ 64 – 256mm
	Carbonate etching		Rubified rock undersides	% Pebble	≥ 4 – 64 mm
	Coppice dunes: active / relict		Soil development	% Granule	≥ 2 – 4 mm
	Deflated surface	✓	Surface rounding of landform	% Sand	≤ 2 mm
	Pavement	✓	Woody debris in place	% Silt/Clay	Fines
	Other:				

Relict swales present in review area.

Fluvial Indicators					
	Bars: sand / gravel		Mud: cracks / curls / drapes		Sediment tails: sand / gravel
	Cut banks		Organic drift		Vegetation-channel alignment
✓	Drainage swales		Overturned rocks		Water-cut benches
	Exposed roots		Scour		Wrack
	First-order streams		Sediment ramps: sand / gravel		Wrinkle marks
	Flow lineations		Sediment sorting		
	Other:				

Relict swales that do not show fluvial indicators were not mapped as watercourse.

Vegetation

Estimated % perennial plant cover: 15-25 | Perennial plant size compared to watercourse veg: smaller / same / larger

Estimate species composition of shrubs and perennial plants by % of total:

creosote, ephedra, Ambrosia, cholla

Site ID: 29 Palms	Stream ID: MESA-T-08	page 3 of 4

Note presence or absence of each indicator within a minimum distance of 50 feet upstream and 50 feet downstream of a representative channel cross section. Mark each box with a plus (+) for those indicators observed, and a minus (–) for those not observed. For examples see the Photo Atlas in MESA ~ Mapping Episodic Stream Indicators.

WATERCOURSE or WATERCOURSE COMPLEX

Transportation, Deposition & Flow Transition Indicators				Substrate Particle Size	
	Bar forms: sand / gravel		Secondary channels	Estimated percentages	
	Bifurcated flow		Sediment plastering	% Bedrock / Cemented substrate	
	Drainage swales		Sediment ramps: sand / gravel	% Boulder	≥ 256 mm
	Flow lineations		Sediment sheets: sand / gravel	% Cobble	≥ 64 – 256 mm
	Imbricated gravel	✓	Sediment sorting	% Pebble	≥ 4 – 64 mm
	Levee ridges: sand / gravel		Sediment tails: sand / gravel	% Granule	≥ 2 – 4 mm
	Mud: cracks / curls / drapes	✓	Vegetation-channel alignments	% Sand	≤ 2 mm
	Organic drift		Wrack	% Silt/Clay	Fines
	Overturned rocks		Wrinkle marks		
	Out-of-channel flow: Lateral floodplain / Terminal floodplain				
	Ripples				
	Other:				

Erosion Indicators

✓	Cut banks		Rills		Water-cut benches
	Exposed roots		Scour		Water level mark
	Headcuts		Secondary channels		
	Other:				

Indicators disturbed due to OHV use.

Vegetation

Estimated % perennial plant cover:	Perennial plant size relative to uplands vegetation: smaller / same / larger

Estimate species composition of perennial plants by % of total:

N/A

INDICATORS of PONDING & EVAPORATION and EOLIAN TRANSPORT & DEPOSITION

	Algal crusts		Sand-filled channels		
	Beach ridges		Springs		
	Coppice dunes: active / relict		Substrate staining		
	Crusts: carbonate / salt / soda		Vegetation-landscape alignments		
	Mud: cracks / curls / polygons				
	Other:				

none

Site ID 29 Palms	Stream ID MESA-T-08	page 4 of 4

Diagrams and Notes

Photographs

Photographs should document the representative landscape units, vegetation, and the presence or absence of representative stream indicators.

Photo ID #	Description	GPS location	

Appendix D
Review Area Photos



Photo 1. View of Transect (T)-1 collected at NWW-1b, facing southeast.



Photo 2. View of OHWM-T-2 collected at NWW-1c, facing south.

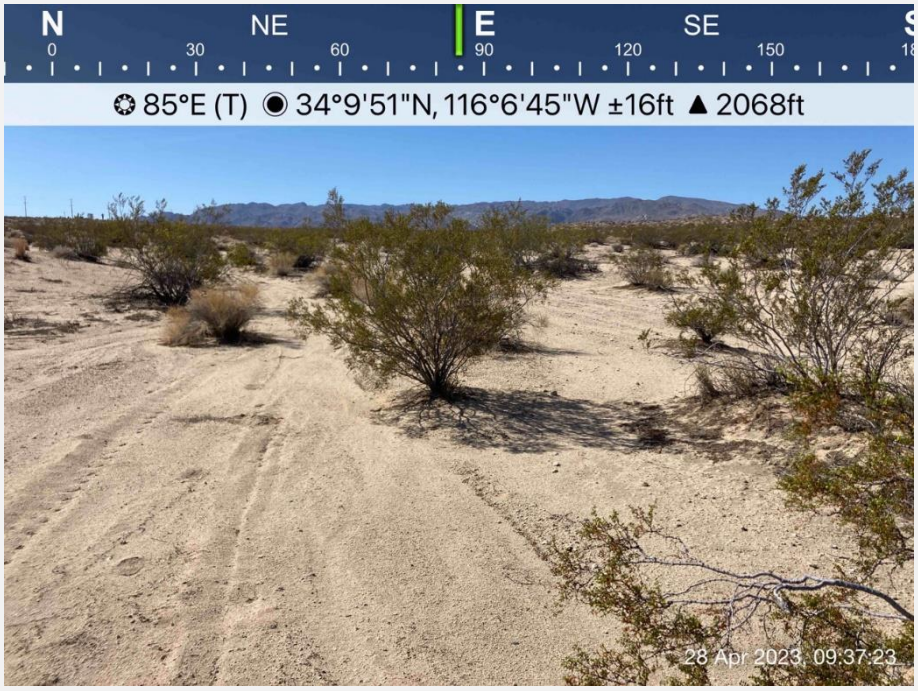


Photo 3. View of OHWM-T-4 collected at an OHV road, facing east.



Photo 4. View of OHWM-T-3 collected at NWW-1a, facing northwest.



Photo 5. View of OHWM-T-5 collected at a non-jurisdictional area, facing southwest.



Photo 6. View of OHWM-T-6 collected at NWW-1, facing southwest.



Photo 7. View of non-jurisdictional area along OHWM-T-7 and MESA-T-04 in the western portion of the site, facing southeast.



Photo 8. View of OHWM-T-8 collected at a non-jurisdictional area centrally located within the site, facing north.



Photo 9. View of a non-jurisdictional road in the eastern portion of the site, facing north.

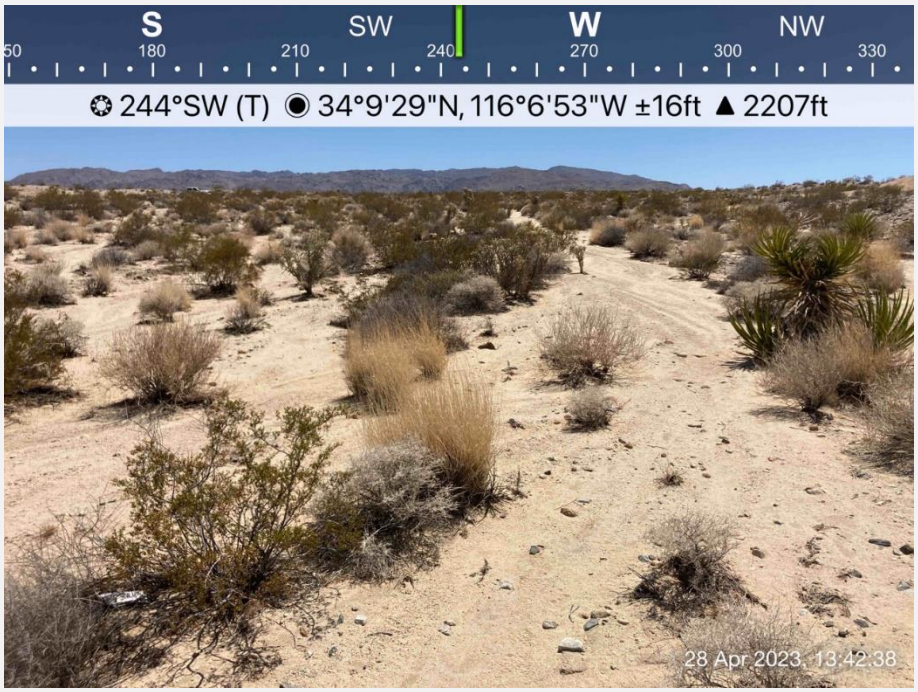


Photo 10. View of non-jurisdictional area within the southern portion of the site, facing southwest.



Photo 11. View of the southern portion of the site demonstrating no jurisdictional features, facing southwest.

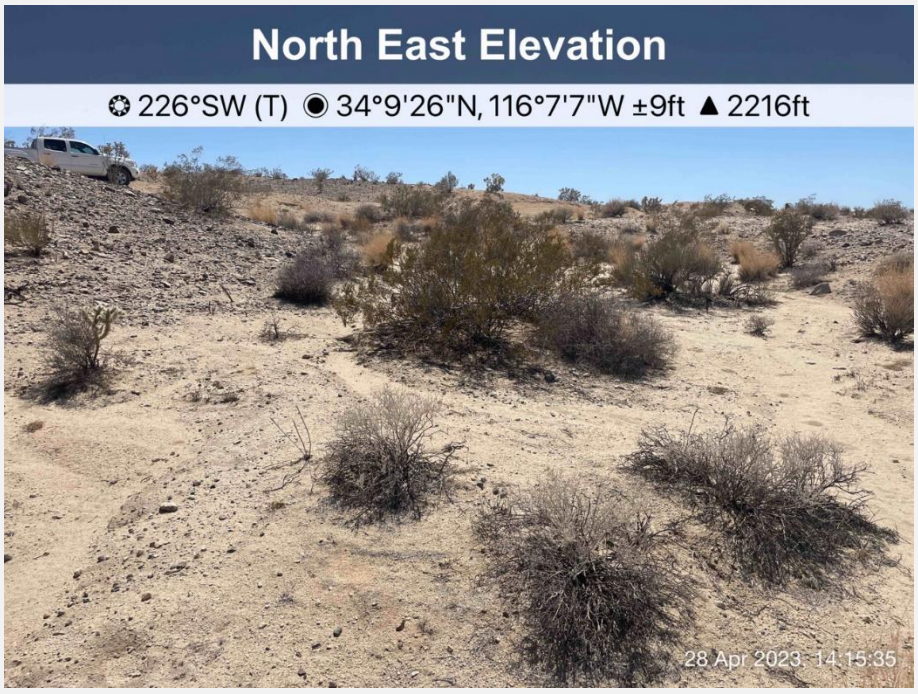


Photo 12. View of the southern portion of the site demonstrating no jurisdictional features, facing southwest.



Photo 13. View of OHWM-T-9 collected at NWW-1d, facing south.



Photo 14. View of OHWM-T-10 within the off-site gen-tie and road alignment at the upstream portion of NWW-1b, facing southwest.

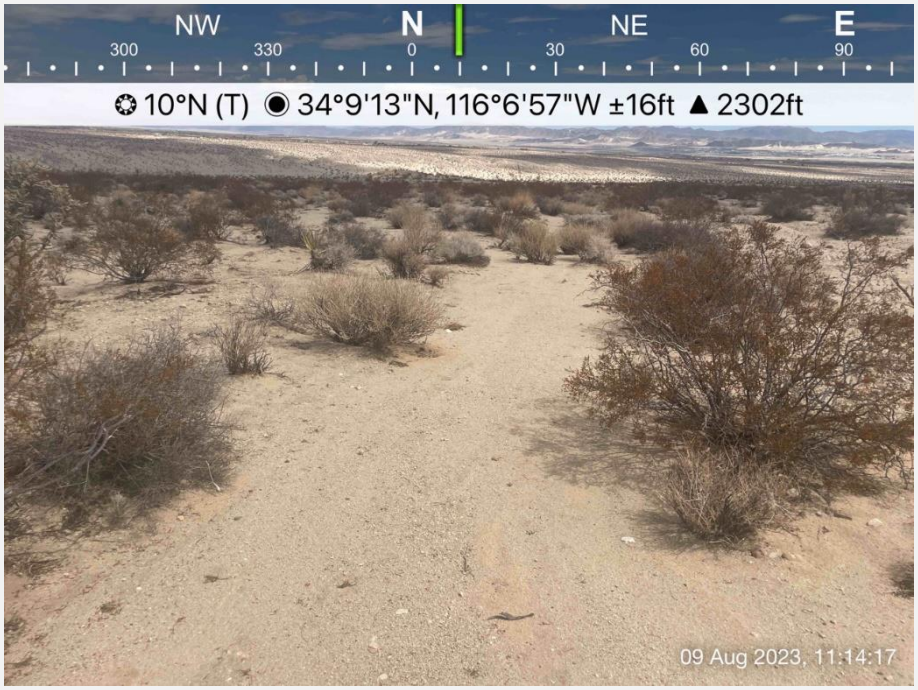


Photo 15. View of the off-site gen-tie alignment demonstrating no jurisdictional features, facing south.

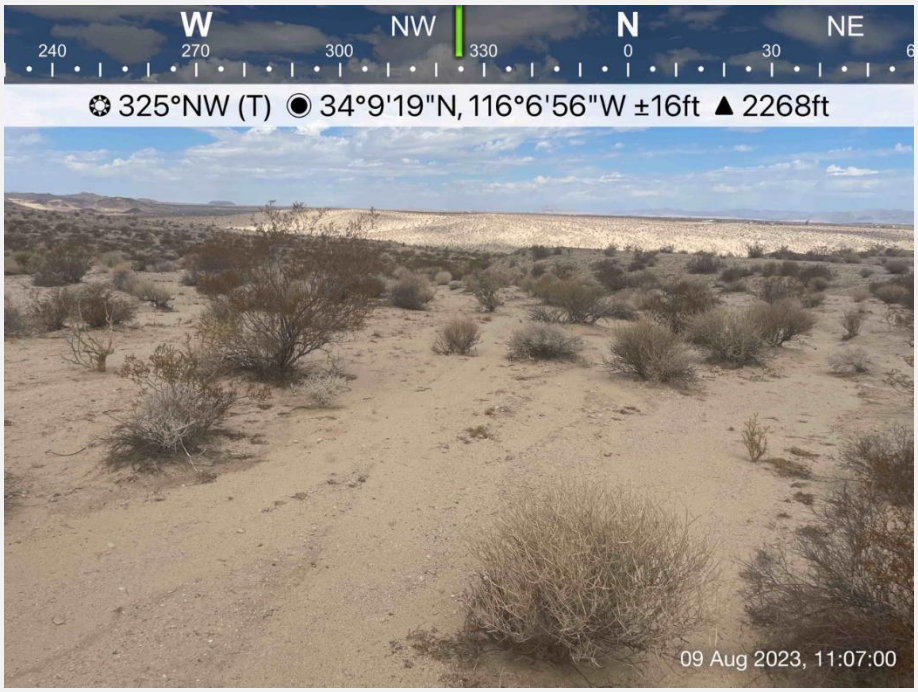


Photo 16. View of the off-site gen-tie alignment demonstrating no jurisdictional features, facing northwest.



Photo 17. View of OHWM-T-11 collected at a non-jurisdictional area within the western portion of the site, facing south/southwest. Sheet flows resulting from natural sloping topography.

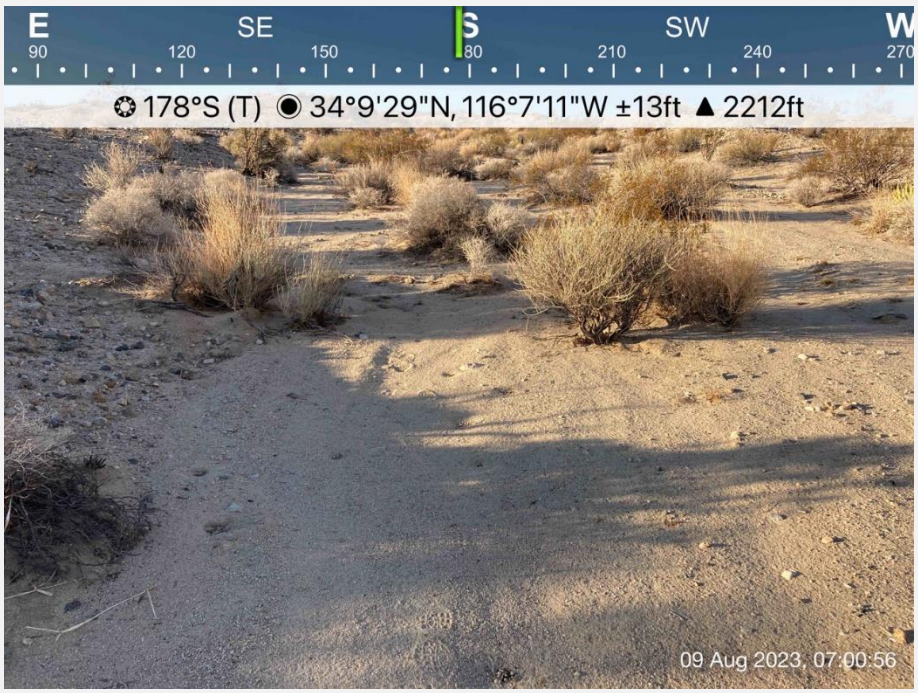


Photo 18. View of non-jurisdictional area within the southwestern portion of the site, facing south. Sheet flows resulting from natural sloping topography.

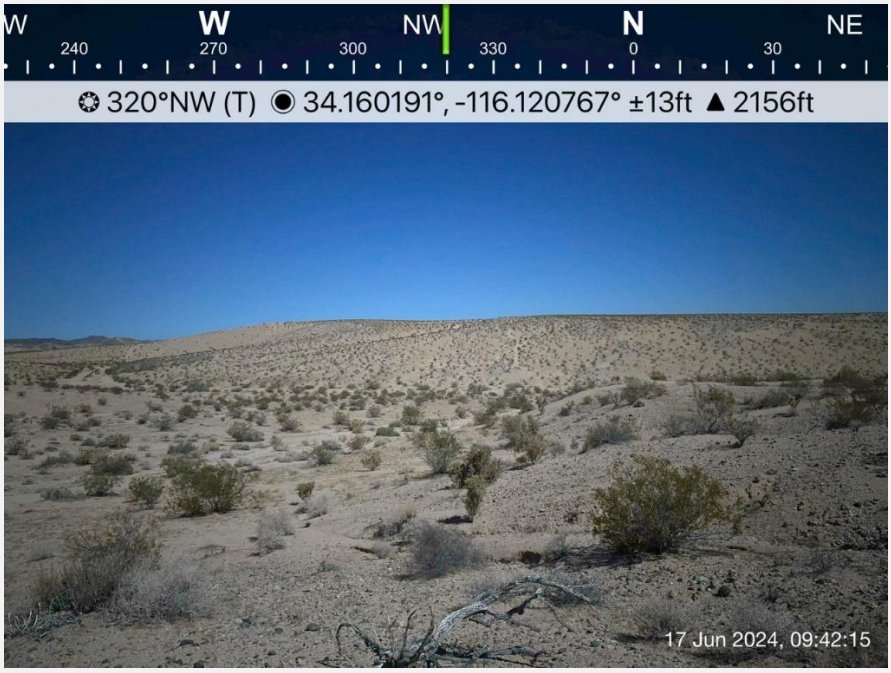


Photo 19. View of non-jurisdictional area along MESA-T-01 collected at an area adjacent to, but outside of NWW-1d within the western portion of the site, facing northwest.



Photo 20. View of SDAM-T-2 near NWW-1 from the top down within the northwestern portion of the site, facing northeast.



Photo 21. View of SDAM-T-3 taken within NWW-1a from the top down within the northwestern portion of the site, facing north/northeast.



Photo 22. View of MESA-T-6 taken in a non-jurisdictional area within the northern-central portion of the site, facing west/southwest.



Photo 23. View of SDAM-T-4 taken NWW-1b within the northeaster portion of the site, facing south/southeast.

Appendix E

Approved Jurisdictional Determination Form

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): October 10, 2012

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: LA District, Marine Air Ground Task Force Training Command, 2012-00589-CLH

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: California County/parish/borough**:** San Bernardino City: near Amboy
Center coordinates of site (lat/long in degree decimal format): Lat. 34.47733° **N**, Long. -115.685° **W**.
Name of nearest waterbody: Mesquite Lake
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: N/A
Name of watershed or Hydrologic Unit Code (HUC): Southern Mojave, Lower Mojave Desert (HUC #18100100)

☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date: October 10, 2012
☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** *"navigable waters of the U.S."* within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are no** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply):

☐ TNWs, including territorial seas
☐ Wetlands adjacent to TNWs
☐ Relatively permanent waters[1] (RPWs) that flow directly or indirectly into TNWs
☐ Non-RPWs that flow directly or indirectly into TNWs (no adjacent wetlands)
☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
☐ Wetlands adjacent to but not directly abutting RPWs (with a surface connection) that flow directlyor indirectly into TNWs
☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
☐ Impoundments of jurisdictional waters
☐ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:

Non-wetland waters: linear feet: width (ft) and/or acres.
Wetlands: acres.

c. Limits (boundaries) of jurisdiction based on: **Pick List**

Elevation of established OHWM (if known): .

2. Non-regulated waters/wetlands (check if applicable):[2]

☒ **Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:**

The Mesquite Lake Watershed is situated within the closed basin of the Southern Mojave Watershed. Mesquite Lake and its non-RPW tributaries function as an isolated intrastate system, which lacks the presence of a TNW. Moreover, Mesquite Lake and all tributaries to Mesquite Lake are NOT (a)(3) waters as defined by 33 CFR 328.3, as they do NOT meet criteria (a)(3)(i-iii) and since surface waters are

[1] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[2] Supporting documentation is presented in Section III.F.

NOT used for industrial or other commercial purposes by interstate commerce industries. Mesquite Lake is situated within California, San Bernardino County, near Amboy. Mesquite Lake covers an area exceeding 7,430-acres.

Typical rainfall average in this area ranges from 3- to 5-inches. The groundwater level is near the surface of Mesquite Lake. Currently, there are no published commercial uses of the surface waters of any tributaries to Mesquite Lake, and the review of aerial photographs (Google Earth) also did not depict surface water usage of any drainages tributary to Mesquite Lake. Therefore, all tributaries to Mesquite Lake are NOT (a)(3) waters as defined by 33 CFR 328.3 (a)(3)(iiii).

Mesquite Lake, as the terminus for all waters within the Mesquite Lake Watershed, is NOT a TNW. Moreover, Mesquite Lake is NOT an (a)(3)water as defined by 33 CFR 328.3. Mesquite Lake does NOT meet criteria (a)(3)(i-iii), as it: i) DOES NOT have use for surface water recreation or other purposes by foreign or interstate travelers, ii) DOES NOT have harvesting activities of fish or shellfish that may be sold in interstate or foreign commerce, and iii) DOES NOT have surface water industrial usage by industries in interstate commerce. Similar to the tributaries of Mesquite Lake, there are no published uses of Mesquite Lake surface waters, mining or otherwise, and there is lack of evidence of any commerce/commercial activity within Mesquite Lake based on the review of aerial photographs (Google Earth). Mesquite Lake has been determined to be an intrastate isolated water without a surface water connection to commerce, all tributaries to Mesquite Lake as part of the overall watershed system are also isolated and additionally have no nexus to commerce. Thus, the Mesquite Lake Watershed is an isolated watershed system that has no surface water connection to commerce.

Based on the information above, the Corps concludes that all tributaries to Mesquite Lake are NONJURISDICTIONAL waters of the United States, since the waters are NOT tributary to either a TNW or an (a)(3) water and are NOT (a)(3) waters themselves.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
Identify TNW: .

Summarize rationale supporting determination: .

2. Wetland adjacent to TNW
Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[3] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

[3] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:
Watershed size: **Pick List**
Drainage area: **Pick List**
Average annual rainfall: inches
Average annual snowfall: inches

(ii) Physical Characteristics:
(a) Relationship with TNW:
☐ Tributary flows directly into TNW.
☐ Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW.
Project waters are **Pick List** river miles from RPW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Project waters are **Pick List** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: .

Identify flow route to TNW[4]: .
Tributary stream order, if known: .

(b) General Tributary Characteristics (check all that apply):
Tributary is: ☐ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
Average width: feet
Average depth: feet
Average side slopes: **Pick List.**

Primary tributary substrate composition (check all that apply):
☐ Silts ☐ Sands ☐ Concrete
☐ Cobbles ☐ Gravel ☐ Muck
☐ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain: .

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Pick List**
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for: **Pick List**
Estimate average number of flow events in review area/year: **Pick List**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Pick List.** Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[5] (check all indicators that apply):
☐ clear, natural line impressed on the bank ☐ the presence of litter and debris
☐ changes in the character of soil ☐ destruction of terrestrial vegetation
☐ shelving ☐ the presence of wrack line
☐ vegetation matted down, bent, or absent ☐ sediment sorting

[4] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.
[5] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

☐ leaf litter disturbed or washed away
☐ sediment deposition
☐ water staining
☐ other (list):
☐ scour
☐ multiple observed or predicted flow events
☐ abrupt change in plant community

☐ Discontinuous OHWM.[6] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☐ High Tide Line indicated by:
- ☐ oil or scum line along shore objects
- ☐ fine shell or debris deposits (foreshore)
- ☐ physical markings/characteristics
- ☐ tidal gauges
- ☐ other (list):

☐ Mean High Water Mark indicated by:
- ☐ survey to available datum;
- ☐ physical markings;
- ☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .

Identify specific pollutants, if known: .

(iv) Biological Characteristics. Channel supports (check all that apply):

☐ Riparian corridor. Characteristics (type, average width): .
☐ Wetland fringe. Characteristics: .
☐ Habitat for:
- ☐ Federally Listed species. Explain findings: .
- ☐ Fish/spawn areas. Explain findings: .
- ☐ Other environmentally-sensitive species. Explain findings: .
- ☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: acres

Wetland type. Explain: .

Wetland quality. Explain: .

Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:

Flow is: **Pick List**. Explain: .

Surface flow is**: Pick List**

Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .

☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

☐ Directly abutting
☐ Not directly abutting
- ☐ Discrete wetland hydrologic connection. Explain: .
- ☐ Ecological connection. Explain: .
- ☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW

Project wetlands are **Pick List** river miles from TNW.

Project waters are **Pick List** aerial (straight) miles from TNW.

Flow is from: **Pick List.**

Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .

Identify specific pollutants, if known: .

[6]Ibid.

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☐ Riparian buffer. Characteristics (type, average width): .
- ☐ Vegetation type/percent cover. Explain: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **Pick List**

Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed: .

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   ☐ TNWs: linear feet width (ft), Or, acres.
   ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally

   Provide estimates for jurisdictional waters in the review area (check all that apply):
   ☐ Tributary waters: linear feet width (ft).
   ☐ Other non-wetland waters: acres.
   Identify type(s) of waters: .

3. **Non-RPWs[7] that flow directly or indirectly into TNWs.**
   ☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional waters within the review area (check all that apply):
   ☐ Tributary waters: linear feet width (ft).
   ☐ Other non-wetland waters: acres.
   Identify type(s) of waters: .

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
   ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

   ☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
   ☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[8]**
   As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
   ☐ Demonstrate that impoundment was created from "waters of the U.S.," or
   ☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
   ☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

[7] See Footnote # 3.
[8] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[9]

☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☒ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
☐ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: **dated July 31, 2012**.
☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study: .
☒ U.S. Geological Survey Hydrologic Atlas: .
☐ USGS NHD data.
☒ USGS 8 and 12 digit HUC maps.
☐ U.S. Geological Survey map(s). Cite scale & quad name:.
☐ USDA Natural Resources Conservation Service Soil Survey. Citation: .
☒ National wetlands inventory map(s). Cite name: Online at http:// www.fws.gov/wetlands/Data/Mapper.html..
☐ State/Local wetland inventory map(s): .
☐ FEMA/FIRM maps: .
☐ 100-year Floodplain Elevation is:

[9] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

☒ Photographs: ☒ Aerial (Name & Date): Google Earth September 2012
.
or ☐ Other (Name & Date): .
☐ Previous determination(s). File no. and date of response letter:
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☐ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: None.

Appendix C
Photo Documentation



Photo 1. Representative view of NWW-1 with OHV tracks within the northern portion of the site facing southwest.



Photo 2. Representative view of the desert tortoise occupied burrow along the western boundary.



Photo 3. Representative view of desert-willow – smoketree wash woodland within northwestern portion of site facing southwest.



Photo 4. Representative view of NWW-1a within the central portion of the site.

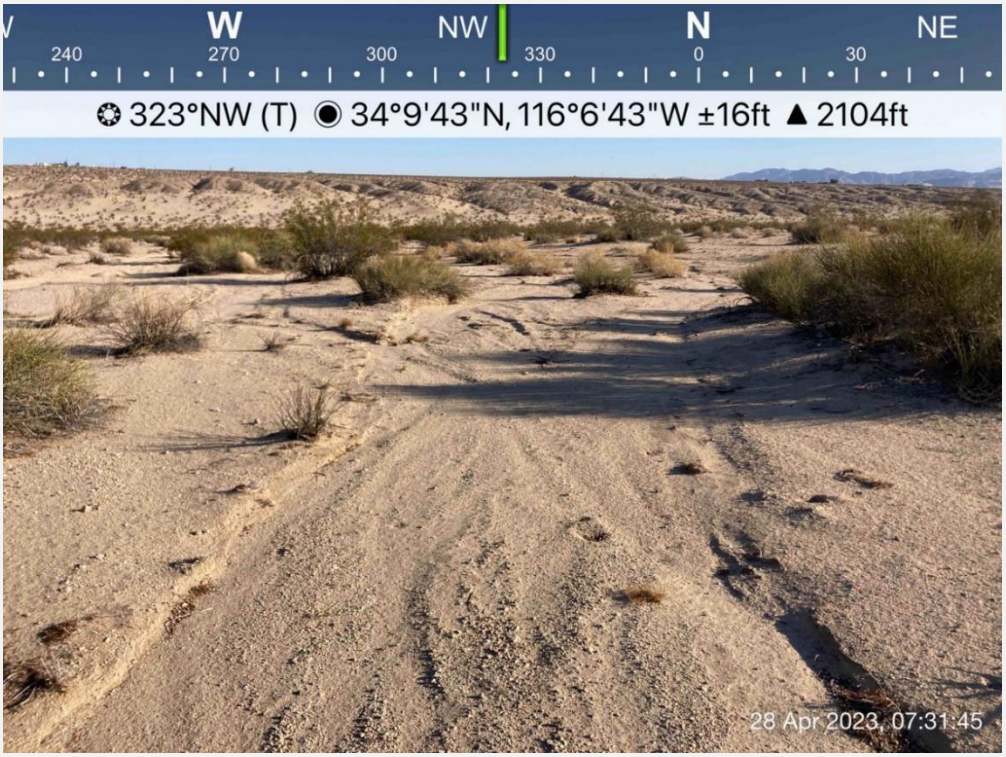


Photo 5. Representative view of NWW-1b within the eastern portion of the site.



Photo 6. Representative view of habitat within the southern portion of the site.



Photo 7. Representative view of desert tortoise burrow with fresh tortoise scat along the western boundary.

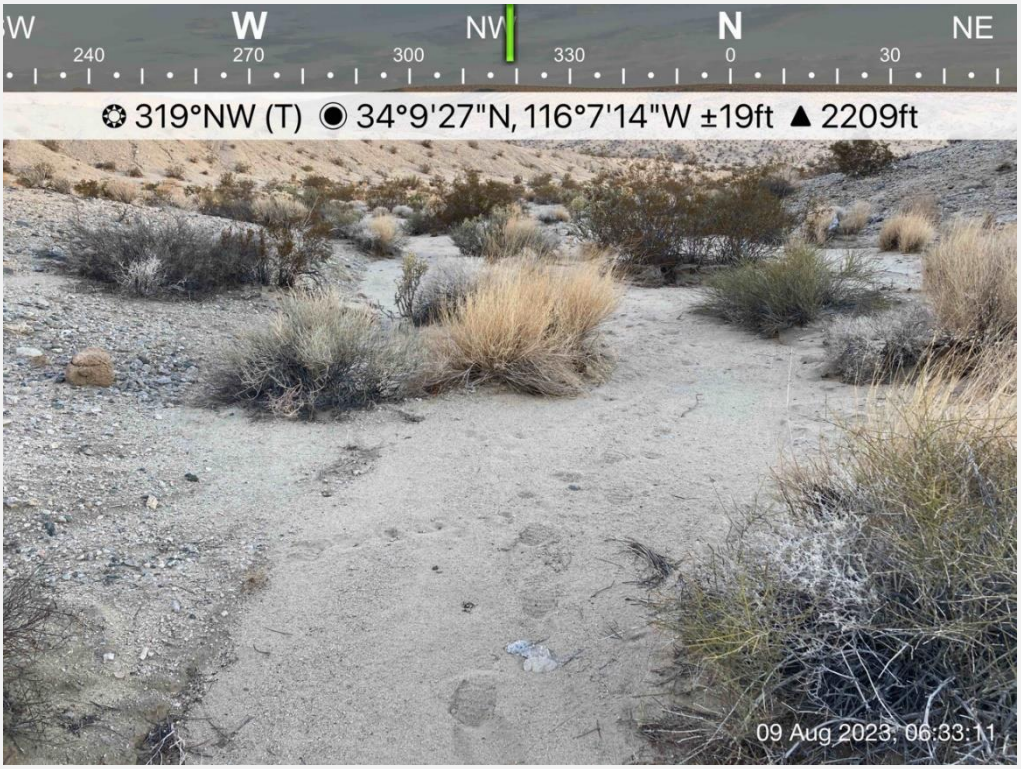


Photo 8. Representative photo of habitat within the southern portion of the site facing northwest.

Appendix D
Plant Compendium

Plant Species

Vascular Species

Eudicots

APOCYNACEAE – DOGBANE FAMILY

Asclepias erosa – desert milkweed
Funastrum cynanchoides – fringed twinevine
Funastrum utahense – Utah vine milkweed

ASTERACEAE – SUNFLOWER FAMILY

Adenophyllum porophylloides – San Felipe dogweed
Ambrosia dumosa – white bursage
Ambrosia salsola var. *salsola* – burrobrush
Baileya pauciradiata – laxflower
Baileya pleniradiata – woolly desert marigold
Bebbia juncea var. *aspera* – sweetbush
Calycoseris parryi – yellow tackstem
Chaenactis fremontii – pincushion flower
Encelia actoni – Acton's brittle brush
Encelia frutescens – button brittlebush
Eriophyllum wallacei – woolly easterbonnets
Geraea canescens – hairy desert sunflower
Layia glandulosa – whitedaisy tidytips
Leptosyne californica – California tickseed
Logfia depressa – dwarf cottonrose
Malacothrix glabrata – smooth desertdandelion
Monoptilon bellioides – Mojave desertstar
Palafoxia arida var. *arida* – desert palafox
Pectis papposa – manybristle chinchweed
Rafinesquia neomexicana – New Mexico plumeseed
Trichoptilium incisum – yellowdome

BORAGINACEAE – BORAGE FAMILY

Amsinckia menziesii – Menzies' fiddleneck
Amsinckia tessellata var. *tessellata* – bristly fiddleneck
Cryptantha barbigera – bearded cryptantha
Johnstonella angustifolia – Panamint cryptantha
Pectocarya heterocarpa – chuckwalla combseed

Pectocarya platycarpa – broadfruit combseed
Tiquilia plicata – fanleaf crinklemat

BRASSICACEAE – MUSTARD FAMILY

Caulanthus cooperi – Cooper's wild cabbage
Dithyrea californica – California shieldpod
Lepidium fremontii – desert pepperweed
Lepidium lasiocarpum ssp. *lasiocarpum* – shaggyfruit pepperweed

CACTACEAE – CACTUS FAMILY

Cylindropuntia echinocarpa – silver cholla
Cylindropuntia ramosissima – branched pencil cholla
Echinocactus polycephalus var. *polycephalus* – cottontop cactus
Ferocactus cylindraceus – California barrel cactus
Opuntia basilaris var. *basilaris* – beavertail pricklypear

CARYOPHYLLACEAE – PINK FAMILY

Achyronychia cooperi – onyxflower

CHENOPODIACEAE – GOOSEFOOT FAMILY

* *Salsola tragus* – prickly Russian thistle

CUCURBITACEAE – GOURD FAMILY

Cucurbita palmata – coyote gourd

EUPHORBIACEAE – SPURGE FAMILY

Ditaxis neomexicana – New Mexico silverbush
Euphorbia albomarginata – whitemargin sandmat
Euphorbia polycarpa – smallseed sandmat

FABACEAE – LEGUME FAMILY

Acmispon strigosus – strigose bird's-foot trefoil
Dalea mollissima – soft prairie clover
Lupinus arizonicus – Arizona lupine
* *Melilotus indicus* – annual yellow sweetclover
Psorothamnus emoryi – dyebush
Psorothamnus spinosus – smoketree wash
Senegalia greggii – catclaw acacia
Senna armata – desertsenna

FOUQUIERIACEAE – OCOTILLO FAMILY

Fouquieria splendens – ocotillo

GERANIACEAE – GERANIUM FAMILY

* *Erodium cicutarium* – redstem stork's bill

Erodium texanum – Texas stork's bill

HYDROPHYLLACEAE – WATERLEAF FAMILY

Eucrypta micrantha – dainty desert hideseed

Phacelia crenulata var. *ambigua* – purplestem phacelia

Phacelia crenulata – cleftleaf wildheliotrope

Phacelia distans – distant phacelia

KRAMERIACEAE – RHATANY FAMILY

Krameria erecta – littleleaf ratany

LAMIACEAE – MINT FAMILY

Salvia columbariae – chia

LOASACEAE – LOASA FAMILY

Mentzelia albicaulis – whitestem blazingstar

Mentzelia desertorum – desert blazingstar

Mentzelia involucrata – whitebract blazingstar

Mentzelia obscura – Pacific blazingstar

Petalonyx thurberi ssp. *thurberi* – Thurber's sandpaper plant

MALVACEAE – MALLOW FAMILY

Eremalche rotundifolia – desert fivespot

Sphaeralcea ambigua var. *ambigua* – apricot globemallow

MONTIACEAE – MONTIA FAMILY

Calyptridium monandrum – common pussypaws

NAMACEAE – NAMA FAMILY

Nama demissa var. *demissa* – no common name

NYCTAGINACEAE – FOUR O'CLOCK FAMILY

Abronia villosa var. *villosa* – desert sand verbena

Allionia incarnata var. *incarnata* – trailing windmills

ONAGRACEAE – EVENING PRIMROSE FAMILY

Camissoniopsis bistorta – southern suncup

Chylismia claviformis ssp. *aurantiaca* – browneyes

Chylismia claviformis ssp. *peirsonii* – Peirson's browneyes

Eremothera boothii ssp. *condensata* – shredding suncup

Oenothera deltoides ssp. *deltoides* – birdcage evening primrose
Oenothera primiveris – desert evening primrose

OROBANCHACEAE – BROOM-RAPE FAMILY

Aphyllon cooperi – desert broomrape

PAPAVERACEAE – POPPY FAMILY

Eschscholzia androuxii – Joshua Tree poppy
Eschscholzia glyptosperma – desert poppy
Eschscholzia minutiflora – pygmy poppy

PHRYMACEAE – LOPSEED FAMILY

Diplacus bigelovii var. *bigelovii* – Bigelow's monkeyflower

PLANTAGINACEAE – PLANTAIN FAMILY

Penstemon thurberi – Thurber's beardtongue
Plantago ovata – desert Indianwheat

POLEMONIACEAE – PHLOX FAMILY

Gilia stellata – star gilia
Langloisia setosissima ssp. *setosissima* – Great Basin langloisia
Loeseliastrum matthewsii – desert calico
Loeseliastrum schottii – Schott's calico

POLYGONACEAE – BUCKWHEAT FAMILY

Chorizanthe brevicornu – brittle spineflower
Chorizanthe rigida – rigid spineflower
Eriogonum inflatum – desert trumpet
Eriogonum pusillum – yellowturbans

ZYGOPHYLLACEAE – CALTROP FAMILY

Fagonia pachyacantha – sticky fagonbush
Larrea tridentata – creosote bush

Gymnosperms and Gnetophytes

EPHEDRACEAE – EPHEDRA FAMILY

Ephedra nevadensis – Nevada joint fir
Ephedra trifurca – longleaf joint-fir
Ephedra viridis – Mormon tea

Monocots

AGAVACEAE – AGAVE FAMILY

Hesperocallis undulata – desert lily

Yucca schidigera – Mojave yucca

POACEAE – GRASS FAMILY

Hilaria rigida – big galleta grass

* *Pennisetum ciliare* – buffelgrass

* *Schismus barbatus* – common Mediterranean grass

* signifies introduced (non-native) species

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Appendix E
Wildlife Compendium

Wildlife Species

Birds

Falcons

FALCONIDAE – CARACARAS AND FALCONS

Falco sparverius – American kestrel

Finches

FRINGILLIDAE – FRINGILLINE AND CARDUELINE FINCHES AND ALLIES

Haemorhous mexicanus – house finch

Flycatchers

TYRANNIDAE – TYRANT FLYCATCHERS

Pyrocephalus rubinus – vermilion flycatcher

Goatsuckers

CAPRIMULGIDAE – GOATSUCKERS

Chordeiles acutipennis – lesser nighthawk

Jays, Magpies and Crows

CORVIDAE – CROWS AND JAYS

Corvus corax – common raven

Mockingbirds and Thrashers

MIMIDAE – MOCKINGBIRDS AND THRASHERS

Mimus polyglottos – northern mockingbird

New World Quail

ODONTOPHORIDAE – NEW WORLD QUAIL

Callipepla gambelii – Gambel's quail

New World Vultures

CATHARTIDAE – NEW WORLD VULTURES

Cathartes aura – turkey vulture

Old World Warblers and Gnatcatchers

POLIOPTILIDAE – GNATCATCHERS

Polioptila caerulea – blue-gray gnatcatcher

Pigeons and Doves

COLUMBIDAE – PIGEONS AND DOVES

Zenaida macroura – mourning dove

Roadrunners and Cuckoos

CUCULIDAE – CUCKOOS, ROADRUNNERS, AND ANIS

Geococcyx californianus – greater roadrunner

Shrikes

LANIIDAE – SHRIKES

Lanius ludovicianus – loggerhead shrike

Wrens

TROGLODYTIDAE – WRENS

Campylorhynchus brunneicapillus – cactus wren

New World Sparrows

PASSERELLIDAE – NEW WORLD SPARROWS

Amphispiza bilineata – black-throated sparrow
Artemisiospiza belli – Bell's sparrow
Spizella breweri – Brewer's sparrow
Zonotrichia leucophrys – white-crowned sparrow

Invertebrates

Butterflies

NYMPHALIDAE – BRUSH-FOOTED BUTTERFLIES

Vanessa cardui – painted lady

PIERIDAE – WHITES AND SULFURS

Eurema nicippe – sleepy orange
Nathalis iole – dainty sulphur

Phoebis sennae – cloudless sulphur
Pontia protodice – checkered white

Mammals

Canids

CANIDAE – WOLVES AND FOXES

Canis latrans – coyote

Domestic

CANIDAE – WOLVES AND FOXES

* *Canis familiaris* – domestic dog

Hares and Rabbits

LEPORIDAE – HARES AND RABBITS

Lepus californicus – black-tailed jackrabbit
Sylvilagus audubonii – desert cottontail

Squirrels

SCIURIDAE – SQUIRRELS

Ammospermophilus leucurus – white-tailed antelope squirrel

Reptiles

Lizards

PHRYNOSOMATIDAE – IGUANID LIZARDS

Callisaurus draconoides – zebra-tailed lizard
Phrynosoma platyrhinos – desert horned lizard
Sceloporus occidentalis – western fence lizard
Uta stansburiana – common side-blotched lizard

GEKKONIDAE – GECKOS

Coleonyx variegatus – western banded gecko

TEIIDAE – WHIPTAIL LIZARDS

Aspidoscelis tigris – tiger whiptail

IGUANIDAE – IGUANAS

Dipsosaurus dorsalis – desert iguana

Snakes

COLUBRIDAE – COLUBRID SNAKES

Coluber flagellum – coachwhip

Pituophis catenifer – gophersnake

VIPERIDAE – VIPERS

Crotalus cerastes – sidewinder

Turtles

TESTUDINIDAE – TRUE LAND TORTOISES

Gopherus agassizii – Mojave desert tortoise

* signifies introduced (non-native) species

Appendix F

Special-Status Plant Species Potentially Occurring Within the Biological Survey Area

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Astragalus bernardinus	San Bernardino milk-vetch	None/None/1B.2	Joshua tree "woodland", Pinyon and juniper woodland; Carbonate (often), Granitic (often)/perennial herb/Apr–June/2,950–6,560	**Not expected to occur**. The biological survey area (BSA) is located outside of the species' known elevation range and there is no suitable vegetation present to support this species.
Ayenia compacta	California ayenia	None/None/2B.3	Mojavean desert scrub, Sonoran desert scrub; Rocky/perennial herb/Mar–Apr/ 490–3,590	**Not expected to occur**. This species was not detected during the April 2024 focused survey. While there is suitable habitat within the BSA, the closest known occurrence is approximately 5.4 miles from the BSA (CCH 2023; CDFW 2023).
Boechera dispar	pinyon rockcress	None/None/2B.3	Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland; Granitic, Gravelly/perennial herb/ Mar–June/3,935–8,330	**Not expected to occur.** The BSA is located outside of the species' known elevation range.
Calochortus striatus	alkali mariposa-lily	None/None/1B.2	Chaparral, Chenopod scrub, Meadows and seeps, Mojavean desert scrub; Alkaline, Mesic/perennial bulbiferous herb/Apr–June/230–5,230	**Not expected to occur**. This species was not detected during the April 2024 focused survey. There is suitable vegetation, and the nearest known occurrence is approximately 2.6 miles from the BSA (CCH 2023; CDFW 2023).
Cymopterus multinervatus	purple-nerve cymopterus	None/None/2B.2	Mojavean desert scrub, Pinyon and juniper woodland; Gravelly (sometimes), Sandy (sometimes)/perennial herb/ Mar–Apr/2,590–5,905	**Not expected to occur**. The BSA is located outside of the species' known elevation range.
Erigeron parishii	Parish's daisy	FT/None/1B.1	Mojavean desert scrub, Pinyon and juniper woodland; Carbonate (usually), Granitic (sometimes)/perennial herb/May–Aug/2,620–6,560	**Not expected to occur.** The BSA is located outside of the species' known elevation range.
Grusonia parishii	Parish's club-cholla	None/None/2B.2	Joshua tree "woodland", Mojavean desert scrub, Sonoran desert scrub; Rocky, Sandy/perennial stem/May–June (July)/ 985–5,000	**Not expected to occur**. This species was not detected during the April 2024 focused survey. This conspicuous perennial stem succulent would have been detected if present. There is suitable

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
				vegetation and soils within the BSA and the nearest known occurrence is approximately 7 miles from the BSA (CCH 2023; CDFW 2023).
Jaffueliobryum raui	Rau's jaffueliobryum moss	None/None/2B.3	Alpine dwarf scrub, Chaparral, Mojavean desert scrub, Sonoran desert scrub; Carbonate, Dry, Openings, Rock crevices/moss//1,605–6,885	**Not expected to occur**. This species was not detected during the April 2024 focused survey. There is suitable vegetation within the BSA and the nearest known occurrence is approximately 4.5 miles from the BSA (CCH 2023; CDFW 2023).
Jaffueliobryum wrightii	Wright's jaffueliobryum moss	None/None/2B.3	Alpine dwarf scrub, Mojavean desert scrub, Pinyon and juniper woodland; Carbonate, Dry, Openings, Rock crevices/moss//525–8,200	**Not expected to occur**. This species was not detected during the April 2024 focused survey. There is suitable vegetation present and the nearest known occurrence is approximately 2.8 miles from the BSA (CCH 2023; CDFW 2023).
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	None/None/1B.1	Marshes and swamps (coastal salt), Playas, Vernal pools/annual herb/ Feb–June/5–4,000	**Not expected to occur**. While the BSA is located within the species' known elevation range, there is no suitable vegetation or vernal pools present to support this species.
Linanthus maculatus ssp. *maculatus*	Little San Bernardino Mtns. linanthus	None/None/1B.2	Desert dunes, Joshua tree "woodland", Mojavean desert scrub, Sonoran desert scrub; Sandy/annual herb/ Mar–May/460–4,000	**Not expected to occur**. This species was not detected during the April 2024 focused survey. There is suitable vegetation and sandy soils present, and the nearest known occurrence is approximately 2.4 miles from the BSA (CCH 2023; CDFW 2023).
Matelea parvifolia	spear-leaf matelea	None/None/2B.3	Mojavean desert scrub, Sonoran desert scrub; Rocky/perennial herb/ Mar–May(July)/1,440–3,590	**Not expected to occur**. This species was not detected during the April 2024 focused survey. There is suitable vegetation within the BSA and the nearest known occurrence is approximately 4.3

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
				miles from the BSA (CCH 2023; CDFW 2023).
Menodora spinescens var. *mohavensis*	Mojave menodora	None/None/1B.2	Mojavean desert scrub; Gravelly, Rocky, Slopes/perennial deciduous shrub/ Apr–May/2,260–6,560	**Not expected to occur**. This species was not detected during the April 2024 focused survey. There is suitable vegetation within the BSA and the nearest known occurrence is approximately 6.6 miles from the BSA (CCH 2023; CDFW 2023).
Monardella robisonii	Robison's monardella	None/None/1B.3	Pinyon and juniper woodland/perennial rhizomatous herb/(Feb) Apr–Sep (Oct)/ 2,000–4,920	**Not expected to occur**. While the BSA is located within the species' known elevation range, there is no suitable vegetation present to support this species.
Muhlenbergia appressa	appressed muhly	None/None/2B.2	Coastal scrub, Mojavean desert scrub, Valley and foothill grassland; Rocky/ annual herb/Apr–May/65–5,245	**Not expected to occur**. This species was not detected during the April 2024 focused survey. There is suitable vegetation present within the BSA and the nearest known occurrence is approximately 5.8 miles from the BSA (CCH 2023; CDFW 2023).
Penstemon clevelandii var. *mohavensis*	Mojave beardtongue	None/None/1B.2	Mojavean desert scrub, Pinyon and juniper woodland; Granitic (often), Rocky/perennial herb/Mar–May/ 3,030–5,310	**Not expected to occur.** The BSA is located outside of the species' known elevation range.
Saltugilia latimeri	Latimer's woodland-gilia	None/None/1B.2	Chaparral, Mojavean desert scrub, Pinyon and juniper woodland; Granitic (often), Rocky (sometimes), Sandy (sometimes), Washes (sometimes)/annual herb/ Mar–June/1,310–6,230	**Not expected to occur**. This species was not detected during the April 2024 focused survey. There is suitable vegetation within the BSA and the nearest known occurrence is approximately 5.8 miles from the BSA (CCH 2023; CDFW 2023).
Sidalcea neomexicana	salt spring checkerbloom	None/None/2B.2	Chaparral, Coastal scrub, Lower montane coniferous forest, Mojavean desert scrub,	**Not expected to occur**. This species was not detected during the April 2024 focused survey. There is suitable

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
			Playas; Alkaline, Mesic/perennial herb/Mar–June/50–5,015	vegetation present within the BSA and the nearest known occurrence is approximately 3.4 miles from the BSA (CCH 2023; CDFW 2023).
Sphaeralcea rusbyi var. *eremicola*	Rusby's desert-mallow	None/None/1B.2	Joshua tree "woodland", Mojavean desert scrub/perennial herb/Mar–June/ 3,195–5,395	**Not expected to occur.** The BSA is located outside of the species' known elevation range.
Wislizenia refracta ssp. *refracta*	jackass-clover	None/None/2B.2	Desert dunes, Mojavean desert scrub, Playas, Sonoran desert scrub/annual herb/Apr–Nov/1,965–2,620	**Not expected to occur.** This species was not detected during the April 2024 focused survey. There is suitable vegetation present within the BSA and the nearest known occurrence is approximately 4 miles from the BSA (CCH 2023; CDFW 2023).
Yucca brevifolia	western Joshua tree	None/SC/None	Great Basin grassland, Great Basin scrub, Joshua tree woodland, Mojavean desert scrub, pinyon and juniper woodland, Sonoran desert scrub, valley and foothill grassland/perennial leaf succulent/ Apr–May/1,310–6,560	**Not expected to occur.** No western Joshua tree individuals were observed during the 2024 focused survey.

Notes: CRPR = California Rare Plant Rank; BSA = Biological Survey Area.

Status Designations

Federal

FT: Federally listed as threatened

CRPR (California Rare Plant Rank):

1B: Plants rare, threatened, or endangered in California and elsewhere

2B: Plants rare, threatened, or endangered in California, but more common elsewhere

Threat Rank:

0.1: seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)

0.2: moderately threatened in California (20%–80% of occurrences threatened/moderate degree and immediacy of threat)

0.3 Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

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Appendix G

Special-Status Wildlife Species Potentially Occurring Within the Biological Survey Area

Scientific Name	Common Name	Status (Federal/State)	Habitat	Potential to Occur
Birds				
Aquila chrysaetos (nesting and wintering)	golden eagle	None/FP, WL	Nests and winters in hilly, open/semi-open areas, including shrublands, grasslands, pastures, riparian areas, mountainous canyon land, open desert rimrock terrain; nests in large trees and on cliffs in open areas and forages in open habitats	**Not expected to occur.** No suitable nesting or wintering habitat present within the biological survey area (BSA).
Athene cunicularia (burrow sites and some wintering sites)	burrowing owl	BCC/SSC	Nests and forages in grassland, open scrub, and agriculture, particularly with ground squirrel burrows	**Moderate potential to occur.** There is open scrub present for overwintering individuals. Burrowing owl sign (i.e., pellets) was observed at one burrow located within the northwestern portion of the BSA. The BSA contains numerous suitable burrows that did not contain burrowing owl sign. No burrowing owls were observed during the 2024 focused surveys.
Empidonax traillii extimus (nesting)	southwestern willow flycatcher	FE/SE	Nests in dense riparian habitats along streams, reservoirs, or wetlands; uses variety of riparian and shrubland habitats during migration	**Not expected to occur.** No suitable nesting habitat is present within the BSA to support this species.
Lanius ludovicianus (nesting)	loggerhead shrike	None/SSC	Nests and forages in open habitats with scattered shrubs, trees, or other perches	**Observed.** Suitable nesting and foraging habitat occur within the BSA. This species was observed immediately outside the 100-foot buffer.
Pyrocephalus rubinus (nesting)	vermilion flycatcher	None/SSC	Nests in riparian woodlands, riparian scrub, and freshwater marshes; typical desert riparian with cottonwood, willow, mesquite adjacent to irrigated fields, ditches, or pastures	**Observed.** Suitable foraging habitat occurs within the BSA. This species is not known to nest within the vicinity. This species was observed foraging and perching on a Mojave yucca within the northwestern portion of the site.
Toxostoma bendirei	Bendire's thrasher	BCC/SSC	Nests and forages in desert succulent shrub and Joshua tree habitat in Mojave	**Low potential to occur.** There is suitable desert scrub and yucca and cholla present within the BSA; however, the nearest known

Scientific Name	Common Name	Status (Federal/State)	Habitat	Potential to Occur
			Desert; nests in yucca, cholla, and other thorny scrubs or small trees	occurrence is approximately 8.5 miles from the BSA (CDFW 2023a).
Vireo bellii pusillus (nesting)	least Bell's vireo	FE/SE	Nests and forages in low, dense riparian thickets along water or along dry parts of intermittent streams; forages in riparian and adjacent shrubland late in nesting season	**Not expected to occur.** No suitable nesting habitat present within the BSA to support this species.
Mammals				
Antrozous pallidus	pallid bat	None/SSC	Grasslands, shrublands, woodlands, forests; most common in open, dry habitats with rocky outcrops for roosting, but also roosts in man-made structures and trees	**Low potential to occur.** While there is suitable scrub present, there are no rocky outcrops present within the BSA. The nearest known occurrence is approximately 2.8 miles from the BSA (CDFW 2023a).
Dasypterus xanthinus	western yellow bat	None/SSC	Valley–foothill riparian, desert riparian, desert wash, and palm oasis habitats; below 2,000 feet above mean sea level; roosts in riparian and palms	**Low potential to occur.** While there is suitable desert wash, this species prefers to roost in palms which are not present within the BSA.
Euderma maculatum	spotted bat	None/SSC	Foothills, mountains, desert regions of southern California, including arid deserts, grasslands, and mixed-conifer forests; roosts in rock crevices and cliffs; feeds over water and along washes	**Low potential to occur**. There is suitable foraging habitat present; however, the BSA lacks suitable rock crevices and cliffs for roosting. The nearest known occurrence is approximately 2.6 miles southeast of the BSA (CDFW 2023a).
Eumops perotis californicus	western mastiff bat	None/SSC	Chaparral, coastal and desert scrub, coniferous and deciduous forest and woodland; roosts in crevices in rocky canyons and cliffs where the canyon or cliff is vertical or nearly vertical, trees, and tunnels	**Low potential to occur**. While there is suitable desert scrub present for foraging, there are no cliffs with vertical drop-offs for roosting. Additionally, the nearest known occurrence is approximately 8.4 miles south of the BSA (CDFW 2023a).
Nyctinomops femorosaccus	pocketed free-tailed bat	None/SSC	Pinyon–juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oases; roosts in high cliffs or	**Low potential to occur**. While there is suitable desert scrub habitat present for foraging, there are no cliffs, rock outcrops, or buildings present for roosting. Additionally, the nearest known occurrence is

Scientific Name	Common Name	Status (Federal/State)	Habitat	Potential to Occur
			rock outcrops with drop-offs, caverns, and buildings	approximately 8.4 miles south of the BSA (CDFW 2023a).
Nyctinomops macrotis	big free-tailed bat	None/SSC	Rocky areas; roosts in caves, holes in trees, buildings, and crevices on cliffs and rocky outcrops; forages over water	**Not expected to occur.** No suitable foraging or roosting habitat is present.
Ovis canadensis nelsoni	Nelson's bighorn sheep	None/FP	Steep slopes and cliffs, rough and rocky topography, sparse vegetation; also, canyons, washes, and alluvial fans	**Not expected to occur**. The BSA is located outside any bighorn sheep core areas and patches as designated by the California Desert Linage Network (Penrod et al. 2012). There is a bighorn sheep "less than patch" approximately 800 feet to the west of the BSA. However, this bighorn sheep "less than patch" is isolated (i.e. not directly connected to any bighorn sheep core areas or patches) and the closest patch area is located approximately 2 miles south, which also contains the nearest CNDDB occurrence (approximately 2.5 miles south; CDFW 2023a). There is suitable alluvial fan habitat; however, the BSA does not provide steep slopes or rocky and rough topography needed for providing cover for this species. Therefore, the BSA is not expected to be used for critical life function (foraging, breeding, and rearing of young) or regional movement due to the lack of cover (i.e. open habitat associated with the valley floor) and proximity to rural residential areas.
Taxidea taxus	American badger	None/SSC	Dry, open, treeless areas; grasslands, coastal scrub, agriculture, and pastures, especially with friable soils	**Low potential to occur**. There is suitable habitat present within the BSA; however, the nearest known documented occurrence is approximately 2.6 miles south of the BSA (CDFW 2023a). Additionally, no badgers, nor

Scientific Name	Common Name	Status (Federal/State)	Habitat	Potential to Occur
				sign (i.e., digging, dens), were observed during the 2023 and 2024 surveys.
Puma concolor	Mountain lion	None/SC	Scrubs, chaparral, riparian, woodland, and forest; rests in rocky areas and on cliffs and ledges that provide cover; most abundant in riparian areas and brushy stages of most habitats throughout California, except deserts	**Not expected to occur.** This species occurs in all habitats except xeric regions of the Mojave and Colorado Deserts, which do not support prey populations (e.g. mule deer, bighorn sheep) (CDFW 2023b). A mule deer leg was observed within the access road during project-specific field surveys. However, it is unknown how the leg arrived within the access road and potentially could have been brought in by a dog from off-site areas. Furthermore, there are no mule deer or bighorn sheep herds that are using the BSA regularly enough for the site to provide a sustainable food source for mountain lion (i.e. no live individuals, scat, or tracks were observed during field surveys within the BSA). Additionally, the site contains open habitat lacking cover (i.e. irregular terrain, caves, thickets, rocky outcrops, and/or trees). Therefore, this species is not expected to occur within the BSA.
Vulpes macrotis arsipus	desert kit fox	None/None[1]	Sparse vegetated scrub habitats such as creosote scrub communities that support abundant rodent populations (Center for Biological Diversity 2013).	**Moderate potential to occur**. The BSA contains sparse desert scrub habitats such creosote scrub; however, areas surrounding the BSA are conducive to stray dogs and further limit desert kit fox habitat potential in the area. Desert kit fox sign (i.e., tracks) was observed during the 2024 surveys.

Scientific Name	Common Name	Status (Federal/State)	Habitat	Potential to Occur
Reptiles				
Crotalus ruber	red diamondback rattlesnake	None/SSC	Coastal scrub, chaparral, oak and pine woodlands, rocky grasslands, cultivated areas, and desert flats	**Low potential to occur**. There is suitable arid scrub within the BSA and the nearest known documented occurrence is approximately 3.5 miles northeast of the BSA (CalHerps 2023, CDFW 2023a); however, this species was not observed during the 2023 and 2024 surveys.
Gopherus agassizii	Mojave desert tortoise	FT/ST	Arid and semi-arid habitats in Mojave and Sonoran Deserts, including sandy or gravelly locations along riverbanks, washes, sandy dunes, canyon bottoms, desert oases, rocky hillsides, creosote flats, and hillsides	**Observed**. Active sign (i.e., scat, burrow, carcass) and multiple individuals were observed within the study area during the 2023 Desert Tortoise-focused surveys.
Uma scoparia	Mohave fringe-toed lizard	None/SSC	Loose wind-blown sand dunes, flats with sandy hummocks, washes, and banks of rivers	**Low potential to occur**. While there are washes within the BSA, the nearest known occurrence was documented approximately 10.2 miles north of the BSA (CDFW 2023a).
Insects				
Bombus crotchii	Crotch bumble bee	None/SCE	Open grassland and scrub communities supporting suitable floral resources.	**Not expected to occur.** There are no CNDDB occurrences for this species within the nine USGS 7.5-minute quadrangles containing and surrounding the BSA (CDFW 2023a). Additionally, the closest iNaturalist (2024) observation is 17 miles southwest of the BSA.

Notes: CNDDB = California Natural Diversity Database; BSA = Biological Survey Area.
Status Designations
Federal
BCC: U.S. Fish and Wildlife Service Bird of Conservation Concern
FC: Federal candidate species (former Category 1 candidates)
FE: Federally listed as endangered
FT: Federally listed as threatened
State
FP: California Fully Protected Species

SSC: California Species of Special Concern
SC: State candidate
SCE: State candidate for listing as endangered
SE: State listed as endangered
ST: State listed as threatened
WL: California Watch List Species

References

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CalHerps. Nafis, G. 2023. California Herps - A Guide to the Amphibians and Reptiles of California. Accessed December 2023. https://californiaherps.com/index.html

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Appendix H
Desert Tortoise Forms

Date of survey: 07-Dec-23 (day month, year) Survey biologist(s): See below (name, email, and phone number)

Site description: 29 Palm Solar, ~270 acres, Twentynine Palms (project name and size; general location)

County: San Bernardino Quad: Twentynine Palms Location: 11S 581513.55E, 3780340.35N (UTM coordinates, lat-long, and/or TRS; map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~72.8 ac Transect #: 29 Transect length: 0.6 mile

GPS Start-point: 11S 581978.71E 3779893.64N, 670m (easting, northing, elevation in meters) Start time: 8:47 (am)/pm

GPS End-point: 11S 581681.37E 3779903.32N, 681m (easting, northing, elevation in meters) End time: 3:10 am/(pm)

Start Temp: 13.3 °C End Temp: 21.1 °C

Live Tortoises

Detection number	GPS location Easting	GPS location Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1						
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	GPS location Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1				
2				
3				
4				
5				
6				
7				
8				

See attached form

Biologists: Eilleen Salas; esalas@dudek.com; 626-204-9825
Josh Elson; jelson@dudek.com; 626-204-9834
Luz Badillo; lbadillo@dudek.com; 760-601-3413
Tara Merryman; tmerryman@dudek.com

*No Live Tortoises were detected on 12/7/2023

Tortoise Sign (burrows, scats, carcasses, etc.)

Detection Number	GPS		Time	Tortoise Location	Burrow Class	Notes
	Easting	Northing				
1	581917.2913	3780730.852	Not recorded	No tortoise observed	2	DETO burrow 45cm width no recent sign within enterance. Old scat within burrow and outside of enterance. Sandy nape with washout on edge. NW facing on edge of wash. Class 2 potential.
2	581855.5551	3780762.03	Not recorded	No tortoise observed	4	5 inch burrow. No sign
3	581834.197	3780305.96	Not recorded	No tortoise observed	2	Burrow width 19cm SE facing, no recent sign, maintains shape into back. Easily accessible for wildlife. 3/28/24 SN Potential for BUOW, no recent sign.
4	581781.5083	3780251.678	Not recorded	No tortoise observed	4	6-7 inch burrow. No sign. Some vegetation found within
5	581747.6617	3780172.891	Not recorded	No tortoise observed	4	No sign, Old DETO burrow (cobwebs in entrance), class 4, 26 cm entrance, NE facing, maintained shape, cannot see back. 3/28/24 SN Potential for BUOW, no sign.
6	581702.5591	3780637.473	Not recorded	No tortoise observed	5	6 inch burrow. Loose soil apron. Webs and debris inside. Tapers off to about 4 inches inside.
7	581706.0909	3780733.215	Not recorded	No tortoise observed	5	6 inch and Narrows off to 4. Likely not deep enough for BUOW.
8	581683.3637	3780053.012	Not recorded	No tortoise observed	3	No sign, can see back of burrow, maintains shape. DETO can easily access. Class 3. 26 cm, facing W. 3/28/24 SN Potential for BUOW, no sign.
9	581618.227	3780679.981	Not recorded	No tortoise observed	4	6 inch. Stays consistent width. Tapers in height. Apron compact. 3/38/24 SN Potential for BUOW, no sign.
10	581639.3715	3780786.487	Not recorded	No tortoise observed	4	Maintains shape, 5 in, potential BUOW, no sign

Date of survey: 08-Dec-23 (day, month, year) Survey biologist(s): See below (name, email, and phone number)

Site description: 29 Palms Solar, ~270 acres, Twentynine Palms (project name and size; general location)

County: San Bernardino Quad: Twentynine Palms Location: 11S 581513.55E, 3780340.35N (UTM coordinates, lat-long, and/or TRS; map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~88.4ac Transect #: 35 Transect length: 0.6mi

GPS Start-point: 11S 580928.55N 3779912.72, 681m (easting, northing, elevation in meters) Start time: 7:43 am/pm

GPS End-point: 11S 581293.81 3779923.75, 682m (easting, northing, elevation in meters) End time: 4:14 am/pm

Start Temp: 11.1 °C End Temp: 16.1 °C

Live Tortoises

Detection number	GPS location Easting	GPS location Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1						
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	GPS location Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1				
2				
3				
4				
5				
6				
7				
8				

See attached form

Biologists: Eilleen Salas; esalas@dudek.com; 626-204-9825
Josh Elson; jelson@dudek.com; 626-204-9834
Luz Badillo; lbadillo@dudek.com; 760-601-3413
Tara Merryman; tmerryman@dudek.com
Sarah Greely; sgreely@dudek.com; 760-601-3414

Live Tortoises

Detection Number	GPS		Time	Tortoise Location	Burrow Class	Notes
	Easting	Northing				
1	581030.7471	3780199.651	9:47 AM	In burrow	1	Adult DETO in burrow, class 1, deterioration on roof and sides, 33 cm burro entrance, southwest facing, scat nearby
2	581051.0492	3780217.368	10:05 AM	In burrow	1	Two adult DETO in burrow: this entry is for one female inside. 33cm width of entrance.
3	581051.0492	3780217.368	10:05 AM	In burrow	1	Same burrow as detection #2. Two adult DETO in burrow; this entry is for adult tortoise of undeterminded sex that is behind the above female adult tortoise. Second tortoise is blocked in the burrow; burrow is 33cm width of entrance.

Tortoise Sign (burrows, scats, carcasses, etc.)

Detection Number	GPS		Time	Tortoise Location	Burrow Class	Notes
	Easting	Northing				
1	581087.6407	3780027.47	Not recorded	No tortoise observed	1	Older fecal, appears recently used, iapron at entrance. Update 12/8. Scat within entrance. No DETO Observed. Burrow looks active.
2	580948.344	3780008.049	Not recorded	No tortoise observed	1	
3	580945.2156	3780009.387	Not recorded	No tortoise observed	2	DETO burrow, north facing, maintains shape, multiple pieces of old scat inside, 39 cm width, DETO could easily renter, no recent sign
4	580925.6838	3780060.759	Not recorded	No tortoise observed	4	Possible pallet, class 4, bird scat piles on ground
5	580925.4482	3780207.573	Not recorded	No tortoise observed	2	Deto, class 2.3/26-no BUOW sign
6	580984.1909	3780356.58	Not recorded	No tortoise observed	3	Pallet, class 3
7	580933.4943	3780156.871	Not recorded	No tortoise observed	4	All dead end digs, perhaps deto, or fox maybe, no scat observed; 4 dead end digs within 30 feet radius
8	580958.7536	3780250.369	Not recorded	No tortoise observed	5	No sign. 8-9ΓÇ¥ across, Potential BUOW 3.26.24-DM
9	581036.0194	3780185.386	Not recorded	No tortoise observed	1	DETO burrow, scat outside and inside of burrow, 32 cm wide, north facing, over 6 in in depth, possibly backfilled.3.26.24_DM Potential for BUOW. 4/23/24 SN fresh DETO scat in burrow.
10	581077.1159	3780362.162	Not recorded	No tortoise observed	4	DETO burrow, class 4, no sign, 28 cm width, over 8 in in depth, cannot see back, east facing
11	581040.4274	3780165.99	Not recorded	No tortoise observed	1	DETO burrow. Maintains shape throughout. Scat present inside and out. CanΓÇÖt see back. 30 cm across. Facing NE. 3.26.24_DM Potential BUOW, DT scat outside and in the burrow. 4/23/24 SN fresh DETO scat inside the burrow
12	581078.6091	3780154.003	Not recorded	No tortoise observed	2	DETO burrow (juvenile), no sign, class 2, NW facing, 8 cm wide, over 8 in in depth, maintains shape
13	581074.3825	3780058.388	Not recorded	No tortoise observed	4	Deto burrow but appears dug up by fox, 20 cm, class 4
14	581061.318	3780029.526	Not recorded	No tortoise observed	5	Possible DETO burrow. Class 5. Has D shape at entrance but opens up more inside. 24 cm across. Facing W
15	581059.021	3779970.155	Not recorded	No tortoise observed	1	DETO burrow. Relatively fresh scat present outside. Class 1. Facing NE. Maintains shape throughout. Can see back. 7/2/24 SN Collapsed burrow.
16	581105.7818	3779982.883	Not recorded	No tortoise observed	2	Deto burrow, class 2, 28cm, 1ΓÇÖ deep, no active sign, no scat. 3.26.24_DM Potential BUOW burrow, DT Scat present inside the burrow. Potentially active burrow.
17	581090.5243	3780159.344	Not recorded	No tortoise observed	4	Possible DETO pallet. Facing North. Has D shape. No sign. Approximately 10 inches across.
18	581121.929	3780644.593	Not recorded	No tortoise observed	5	DETO burrow, class 5, collapsed, no sign, north facing
19	581150.6686	3780426.572	Not recorded	No tortoise observed	5	Deto burrow, class 5, 25cm, no sign, cobwebs.
20	581160.4038	3780407.724	Not recorded	No tortoise observed	4	DETO burrow, also suitable for BUOW, class 4, maintains shape, cannot see back. 3/26-potential BUOW, no signs

21	581138.7101	3780267.252	Not recorded	No tortoise observed	4	Possible juvenile DETO burrow. No sign. Back visible. 12-15 cm across. Facing N. 7/2/24 Burrow is mostly collapsed.
22	581155.3289	3780088.696	Not recorded	No tortoise observed	2	DETO pallet burrow, NE facing
23	581133.5599	3780030.909	Not recorded	No tortoise observed	4	Possible DETO pallet. No sign. Approximately 25 cm across. Facing E. 3/26/24 SN pallet, no BUOW sign.
24	581188.4626	3780139.692	Not recorded	No tortoise observed	2	Deto burrow, class 5, 45 cm. 7/2/24 SN Burrow is collapsed.
25	581229.0158	3780410.697	Not recorded	No tortoise observed	3	Deto burrow, class 3, 20 cm
26	581240.2813	3780351.565	Not recorded	No tortoise observed	5	Potential DETO, class 5, east facing, cannot see back. 3/37 No BUOW sign
27	581240.2716	3780335.533	Not recorded	No tortoise observed	4	DETO burrow, class 4, SE facing, no sign, cobwebs at entrance
28	581235.1813	3780310.295	Not recorded	No tortoise observed	3	Deto burrow, class 3, appears dug out my fox maybe , 20cm
29	581209.5644	3780098.146	Not recorded	No tortoise observed	2	DETO pallet. No sign. Approximately 30 cm across. Back of burrow visible. Facing N. 3/26/24 SN DETO present.
30	581228.8332	3780123.346	3:39 PM	In open sandy/rocky slope toward northern boundary of project site	N/A	Bone fragment from tortoise shell, likely plastron
31	581152.4599	3780259.375	Not recorded	No tortoise observed	1	DETO individual had been observed in this burrow on 8/9/23; no DETO in burrow on 12/8/23

Date of survey: 14-Dec-23 (day, month, year) Survey biologist(s): See below (name, email, and phone number)

Site description: 29 Palms Solar, ~270 acres, Twentynine Palms (project name and size; general location)

County: San Bernardino Quad: Twentynine Palms Location: 11S 581513.55E, 3780340.35N (UTM coordinates, lat-long, and/or TRS; map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~72.8ac Transect #: 29 Transect length: 0.6mi

GPS Start-point: 11S 581293.81E 3779923.75N, 682m (easting, northing, elevation in meters) Start time: 8:22 am/pm

GPS End-point: 11S 581548.54E 3779925.78N, 681m (easting, northing, elevation in meters) End time: 3:15 am/pm

Start Temp: 12.2 °C End Temp: 20.0 °C

Live Tortoises

Detection number	GPS location Easting	Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1						
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1				
2				
3				
4				
5				
6				
7				
8				

See attached form

Biologists: Josh Elson; jelson@dudek.com; 626-204-9834
Luz Badillo; lbadillo@dudek.com; 760-601-3413
Tara Merryman; tmerryman@dudek.com

*No live tortoises were detected on 12/14/23

Tortoise Sign (burrows, scats, carcasses, etc.)

Detection Number	GPS		Time	Tortoise Location	Burrow Class	Notes
	Easting	Northing				
1	581245.9757	3780138.935	Not recorded	No tortoise observed	2	DETO burrow, class 2, very old scat outside of burrow, west facing, 33 cm entrance, cobwebs, maintains shape
2	581257.7133	3780281.761	Not recorded	No tortoise observed	3	DETO burrow, class 3, old scat nearby, west facing, pallet, maintains shape, can see back, 33 cm entrance
3	581300.2478	3780365.88	Not recorded	No tortoise observed	3	DETO burrow, class 3, NE facing, 28 cm entrance, no sign, maintains shape, cannot see back? 3/27/24 SN Potential for BUOW, no cobwebs in entrance, no sign.
4	581356.9882	3780703.644	Not recorded	No tortoise observed	5	Possible DETO burrow. No sign. Back visible. 22 cm. Class 5. Facing NE.
5	581386.5054	3780634.829	Not recorded	No tortoise observed	3	DETO burrow, class 3, no sign, 31 cm entrance, north facing, cannot see back. 3/27/24 SN Potential for BUOW, no sign.
6	581518.5374	3780763.508	Not recorded	No tortoise observed	2	DETO burrow, no sign, 22 cm entrance, northwest facing, maintains shape
7	581350.9799	3780610.596	10:12 AM	In open	N/A	Adult female DETO carcass observed in the open, approximate MCL 240mm. 18 scutes present. 80% of bone present. Clear predation signs with coyote scat near carcass. Full plastron intact.

Date of survey: 15-Dec-23 (day, month, year) Survey biologist(s): See below (name, email, and phone number)

Site description: 29 Palms Solar, ~270 acres, Twentynine Palms (project name and size; general location)

County: San Bernardino Quad: Twentynine Palms Location: 11S 581513.55E, 3780340.35N (UTM coordinates, lat-long, and/or TRS; map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: 36.4ac Transect #: 14 Transect length: 0.6mi

GPS Start-point: 11S 581548.54E, 3779925.78N 681m (easting, northing, elevation in meters) Start time: 8:10 am/pm

GPS End-point: 11S 580734.64E, 3779105.14N, 708m (easting, northing, elevation in meters) End time: 11:44 am/pm

Start Temp: 10.6 °C End Temp: 16.1 °C

Live Tortoises

Detection number	GPS location Easting	GPS location Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1						
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	GPS location Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1				
2				
3				
4				
5				
6				
7				
8				

See attached form

Biologists: Luz Badillo, lbadillo@dudek.com; 760-601-3413
Josh Elson; jelson@dudek.com; 626-204-9834
Tara Merryman; tmerryman@dudek.com
Valerie Goodwin; vgoodwin@dudek.com; 442-568-0015

***No Live Tortoises were detected on 12/15/2023**

Tortoise Sign (burrows, scats, carcasses, etc.)

Detection Number	GPS		Time	Tortoise Location	Burrow Class	Notes
	Easting	Northing				
1	581563.6191	3779543.107	Not recorded	No tortoise observed	3	DETO burrow, class 4, 28 cm entrance, southwest facing, no sign, dilapidated entrance, maintains shape. 3/27/24 SN Potential for BUOW, can see back, cobwebs, no sign of BUOW.
2	581537.9489	3780045.702	Not recorded	No tortoise observed	2	Deto, class 2, no sign, under creosote, small, 6 cm, EAST. 3/27/24 SN collapsed burrow, no potential for BUOW, no sign
3	581535.576	3779998.895	Not recorded	No tortoise observed	5	No sign, class 5, behind creosote. 3/27/24 SN Potential for BUOW, no sign

Desert Tortoise Shell and Skeletal Remains

Township ____, Range ____; ____ County, ~~Arizona~~

29 PALMS SB

Site 29 PALMS SOLAR
Section (A) SE Grid # ____ ☐ Off plot
Roverfile/UTMs 34.163258 -116.117408
Date (mm/dd/yy) 12/14/23
Fieldworker(s) TM, LB, JE

Carcass # 1 Live tortoise # ____
MCL (mm) 240 ☒ Measured ☐ Estimated
Time since death (TSD):
☐ <1 yr ☒ 1-2 yrs ☐ 2-4 yrs ☐ >4 yrs
TSD key progression: ____

Location of remains (describe in notes):
☒ Open
☐ Under shrub
☐ In wash
☐ Partially buried
☐ Buried
☐ At tortoise coversite
☐ At predator site

Position of remains:
☒ Upright
☐ Overturned
☐ Disarticulated

Exposure to Sun (%) 100

Evidence of disease or causes of death:

	Describe
☐ Puncture wounds – teeth	
☐ Puncture wounds – beak	
☐ Chew/gnaw marks	
☐ Remains scattered*	
☒ Predator site	COYOTE/KIT FOX
☒ Predator tracks/sign	COYOTE SCAT
☐ Livestock tracks/sign	
☐ Vehicle tracks/trail/road	
☐ Gunshot (targets/shells)	
☐ Other	

*State distances and location

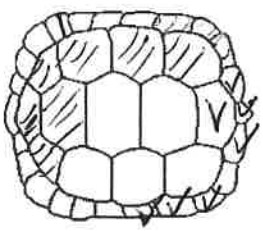
Evidence of scavenging: YES

Notes: ADULT female DETACHED AT PREDATORY SITE SUN BLEACHED BUT LARGE AMOUNT INTACT IN OPEN.

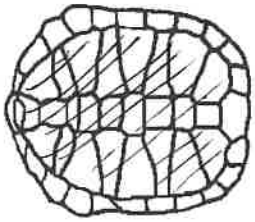
Parts present:	partial	entire	none
Head	☐	☐	☐
Left foreleg	☐	☐	☐
Right foreleg	☐	☐	☐
Left hindleg	☐	☐	☐
Right hindleg	☐	☐	☐
Pectoral girdle	☐	☒	☐
Pelvic girdle	☐	☒	☐

% scutes present 75%
% bones present 80%

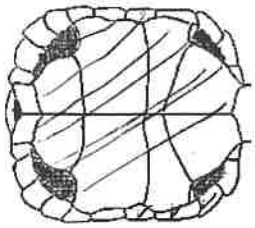
Diagram of existing shell and bones

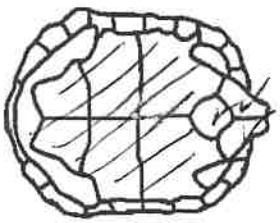


Scutes



Bones





Legend
Pieces present & intact
Pieces present but not intact
Predator chew marks
Not present