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CULTURAL RESOURCE ASSESSMENT FOR THE DOGWOOD GEOTHERMAL ENERGY PROJECT, DOGWOOD SOLAR, AND HEBER 2 SOLAR FACILITIES, IMPERIAL COUNTY, CALIFORNIA

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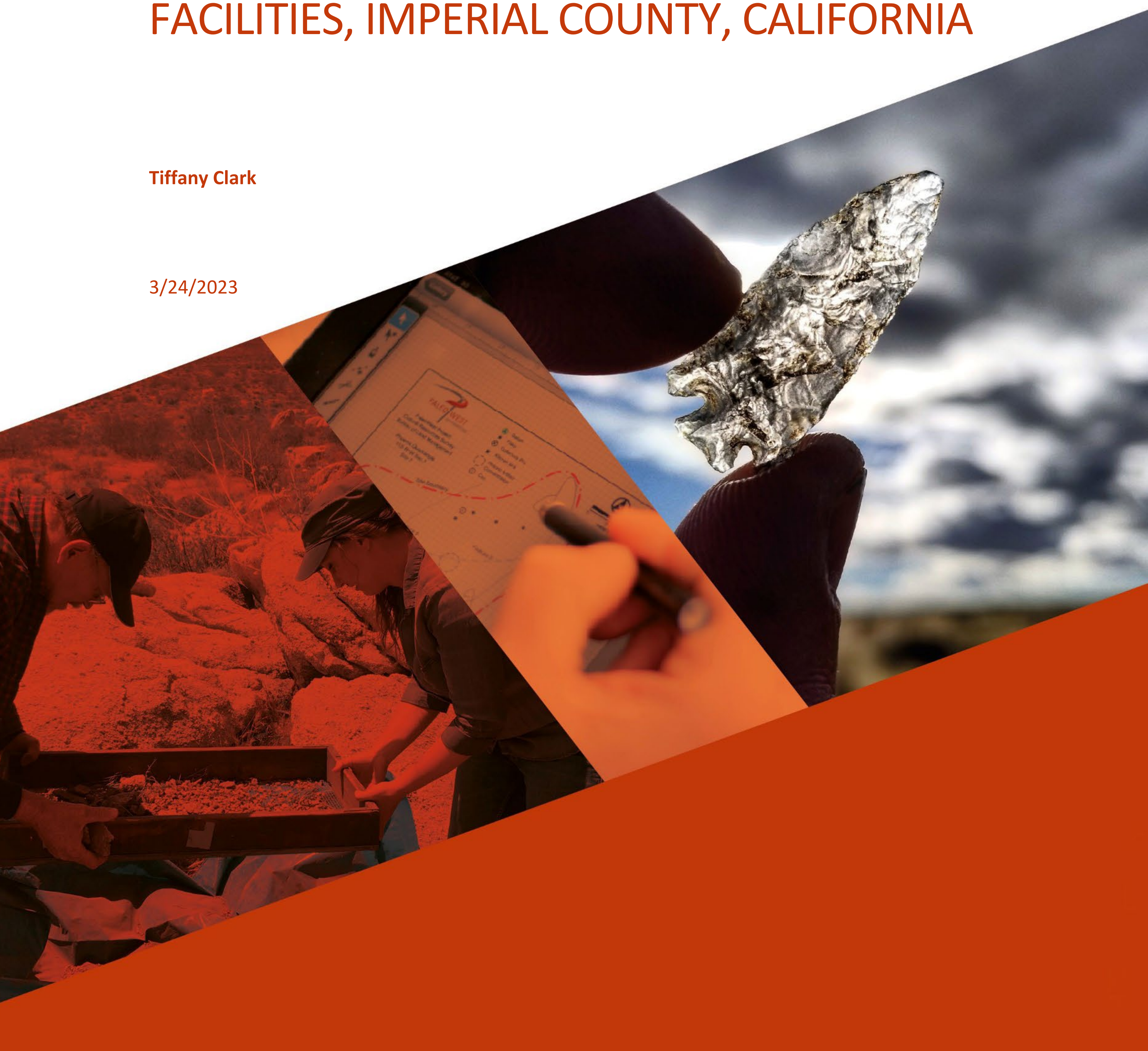

CULTURAL RESOURCE ASSESSMENT FOR THE DOGWOOD GEOTHERMAL ENERGY PROJECT, DOGWOOD SOLAR, AND HEBER 2 SOLAR FACILITIES, IMPERIAL COUNTY, CALIFORNIA

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MANAGEMENT SUMMARY

OrHeber 3, LLC, Heber Field Company, LLC, and the Second Imperial Geothermal Company are proposing to develop the Dogwood Geothermal Energy Project, Dogwood Solar, and Heber 2 Solar Parasitic Facilities (herein Project) near the community of Heber, Imperial County, California. The proposed Project involves the construction and operation of a 25-megawatt geothermal energy facility with associated solar photovoltaic fields, transmission lines, brine pipelines, and wells. The proposed Project would encompass approximately 170 acres of land (Assessor Parcel Number: 054-250-31, 059-020-001, and 054-250-017) within the Imperial County Geothermal Overlay Zone. PaleoWest LLC (PaleoWest) was contracted by Catalyst Environmental Solutions to conduct a cultural resource assessment of the Project area in compliance with the California Environmental Quality Act (CEQA). The Project will be permitted via a Conditional use Permit process with the Imperial County Planning and Development Services acting as the Lead Agency for CEQA compliance.

This report summarizes the methods and results of the cultural resource assessment. The investigation included background research, outreach with the Native American Heritage Commission (NAHC) and Native American groups, a field survey, resource documentation and evaluation, and an impacts analysis. The purpose of the study was to determine the potential of the Project to impact archaeological and historical resources under CEQA.

As part of the background research, PaleoWest conducted a records search at the South Coastal Information Center to identify previously recorded cultural resources and studies located within one mile of the Project area. The records search indicated that at least 35 previous studies have been conducted in the record search area, three of which encompass portions of the current Project. These studies resulted in the documentation of six cultural resources, all of which date to the historic period. No prehistoric resources were identified within one mile of the Project area. None of the previously recorded cultural resource are located within the Project area.

PaleoWest also requested a search of the Sacred Lands File (SLF) from the NAHC on January 19, 2023. Results of the SLF search were obtained on February 28, 2023. The SLF search resulted in positive results with the NAHC recommending that the Ewiiaapaayp Band of Kumeyaay Indians and the Torres-Martinez Desert Cahuilla Indians be contacted to request information on known Native American cultural resources in the Project vicinity. In addition, the NAHC provided a list of 24 individuals representing 16 Native American tribal groups that may also have knowledge of cultural resources in the Project area. Outreach letters were sent to the Native American contacts on March 1, 2023 with follow up correspondence conducted on March 15, 2023. Four comments have been received as of March 23, 2023.

PaleoWest conducted a pedestrian cultural resource survey of the proposed Project area between February 22 and 24, 2023. The survey encompassed all areas of proposed disturbance along with a 300-foot- (91-meter-) buffer around the linear Project elements (proposed transmission line and brine pipeline alignments) (219 acres). Three historic built-environment resources were documented in the Project area (Central Main Canal, Dogwood Canal, and Beech Canal and Drain), all of which are irrigation-related features associated with the All-American Canal system. PaleoWest analyzed the California Register of Historical Resources

(CRHR) eligibility of the three cultural resources under Criteria 1, 2, 3, and 4. Although the Central Main Canal is recommended eligible for listing on the CRHR, an impact analysis indicates that the proposed Project will not result in a substantial change to the significance of the historical resource. The other two resources identified in the Project area, the Dogwood Canal and Beech Canal and Drain, were both recommended not eligible for listing on the CRHR due to a lack of integrity; no further management is recommended for these resources. To mitigate impacts to potential cultural resources that may be encountered during Project construction, PaleoWest recommends mitigation measures be implemented for the discovery of inadvertent archaeological resources and human remains.

1.0 INTRODUCTION

OrHeber 3, LLC, Heber Field Company, LLC, and the Second Imperial Geothermal Company are proposing to develop the Dogwood Geothermal Energy Project, Dogwood Solar, and Heber 2 Solar Parasitic Facilities (herein Project) near the community of Heber in Imperial County, California. PaleoWest LLC (PaleoWest) was contracted by Catalyst Environmental Solutions to conduct a cultural resource assessment of the Project area in compliance with the California Environmental Quality Act (CEQA). The Imperial County Planning and Development Services acting as the Lead Agency for CEQA compliance.

1.1 PROJECT LOCATION AND DESCRIPTION

The proposed Project is located within and adjacent to the existing Heber Geothermal Energy Complex (HGEC) at 855 Dogwood Road in unincorporated Imperial County, California (Figures 1-1 and 1-2). The Project area encompasses approximately 170 acres of land on three parcels (Assessor Parcel Numbers [APNs] 054-250-31, 059-020-001, and 054-250-017) (Figure 1-3). The Project area includes portions of Sections 32 and 33, Township 16 South, Range 14 East, and Sections 3 and 4, Township 17 South, Range 14 East, of the San Bernardino Baseline and Meridian (SBBM), as depicted on the *Heber, CA* 7.5-minute U.S. Geological Survey (USGS) topographic quadrangle (Figure 1-2). Surrounding land uses in the Project vicinity are primarily for industrial facilities, energy facilities, and agricultural cultivation. Solar energy facilities and agricultural cultivation are directly west; a construction/aggregates company is adjacent to the south; agricultural operations are present to the north and east; and, geothermal well pads and pipelines are present throughout the local vicinity (Figure 1-3).

The proposed Project includes the construction and operation of a geothermal plant, solar photovoltaic facilities with an associated substation, a medium voltage connection cable, three geothermal production wells, one injection well, and a brine pipeline (Figure 1-3). The Dogwood geothermal plant would be located within the HGEC (APN 054-250-31). The area of the proposed plant is completely disturbed from energy generation operations and devoid of any vegetation or existing facilities; it is currently used for materials storage and supporting operations.

The Dogwood and Heber 2 parasitic solar photovoltaic facilities would be located immediately southeast of the HGEC (APN 059-020-001). Two separate solar fields are proposed – one to provide auxiliary power to the proposed Dogwood Project and one for the existing Heber 2 plant. The energy generated by the solar facilities will be collected by an on-site substation for a short transmission via cable segment to the Dogwood and Heber 2 geothermal plants. The cable would be attached to the existing pipeline that crosses the IID Central Main canal.

Three new geothermal production wells are proposed for the Project. Two of these wells would be located within the solar energy site (APN 059-020-001) with a third well installed adjacent to an existing geothermal well approximately 1,500 feet due east of the HGEC (APN 054-250-017). A new injection well would also be located adjacent to the proposed Dogwood geothermal plant within the HGEC (Figure 1-3). A small segment of pipeline (approximately 1,000 feet in length) would be developed within the solar site to collect and deliver the new geothermal fluid/brine to an existing pipeline network located adjacent to the proposed solar facilities. The

Figure 1-1. Project vicinity map

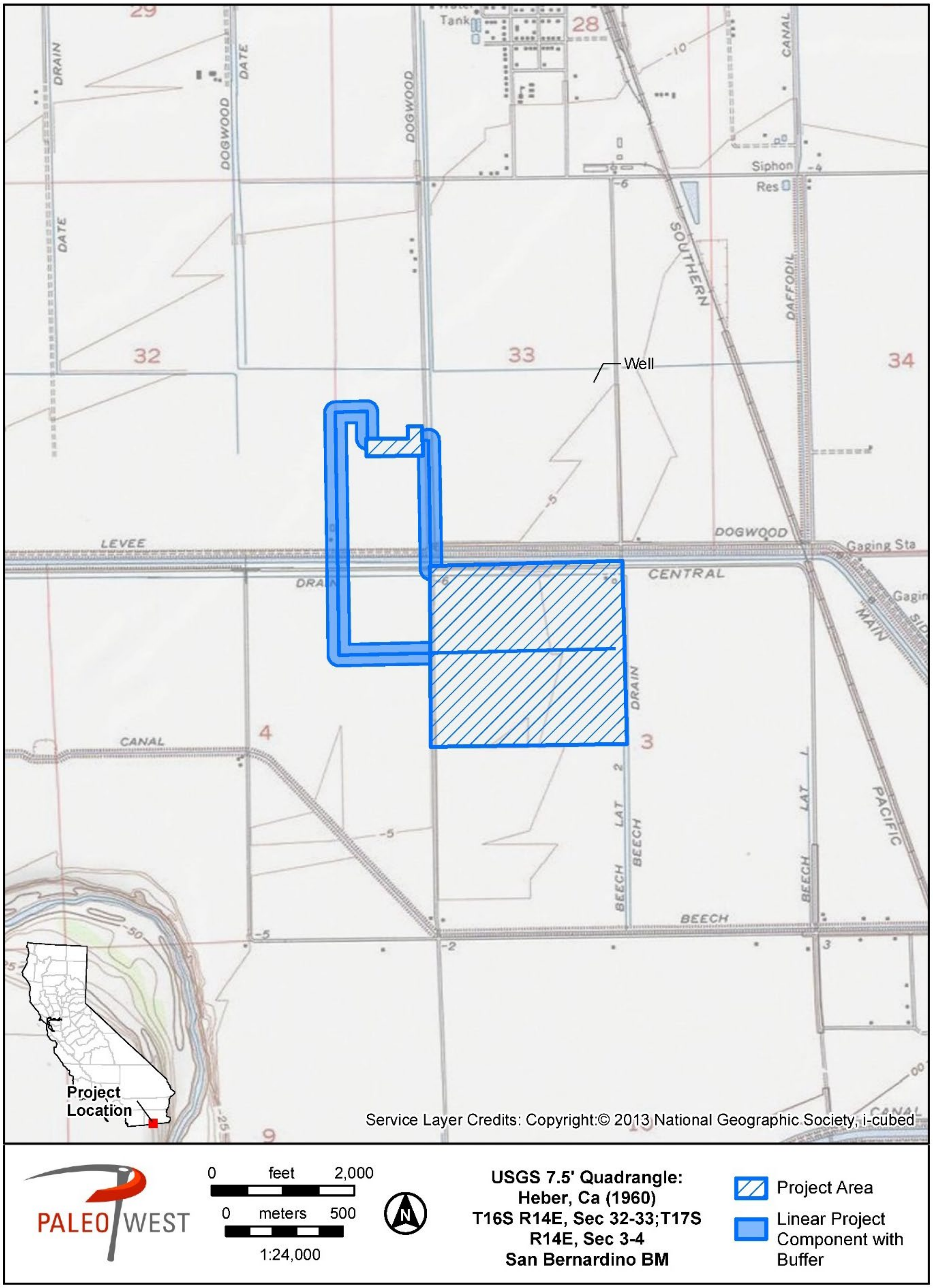

Figure 1-2. Project location map

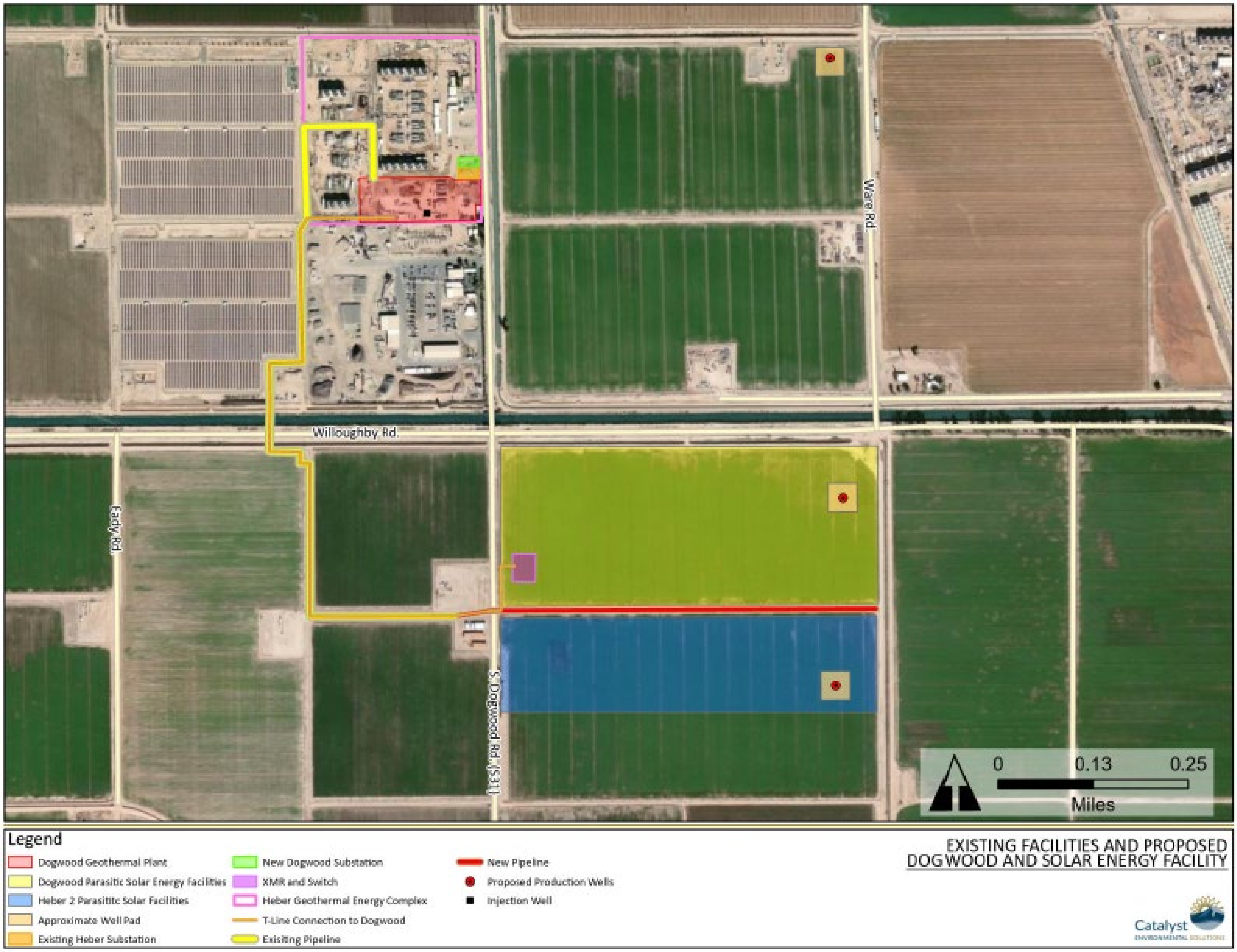

Figure 1-3. Project area map (adapted from Ormat Technologies, Inc. 2023)

third northern well would utilize the existing pipeline network to deliver fluid to the Dogwood plant.

All facilities proposed for the Project are within the County's Geothermal Overlay Zone. Major geothermal projects proposed within these zones may be permitted via a Conditional Use Permit process (County of Imperial 2015) (see discussion in Section 2.3.2).

1.2 PROJECT PERSONNEL

Tiffany Clark, PhD, Register of Professional Archaeologists (RPA), served as Principal Investigator and Project Manager. She directed all fieldwork efforts for the Project and was the primary author on the report. Associate Archaeologist Paige Kohler completed the record search of the South Coastal Information Center (SCIC) with Gena Severen, MA, RPA conducted the Native American outreach. Heather Landazuri, MA, RPA, with assistance from Marlen Hinojosa and Amy Ross, completed the field survey. Brian Spelts served as the GIS analyst. Finally, Richard Guttenberg, MA, RPA, conducted senior technical review of this report.

1.3 REPORT ORGANIZATION

This report documents the results of a cultural resource investigation conducted for the proposed Project. Chapter 1 has introduced the Project location and description. Chapter 2 states the regulatory context for the Project. Chapter 3 synthesizes the natural and cultural setting of the Project area and surrounding region. The results of the previous cultural investigations and the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) search is presented in Chapter 4. The field methods employed during this investigation and the findings are presented in Chapter 5. Management recommendations are provided in Chapter 6. These are followed by bibliographic references and appendices.

2.0 REGULATORY CONTEXT

2.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT

The proposed Project is subject to compliance with CEQA, as amended. Compliance with CEQA statutes and guidelines requires both public and private projects with financing or approval from a public agency to assess the project's impact on cultural resources (Public Resources Code Sections 21082, 21083.2 and 21084 and California Code of Regulations 10564.5). The first step in the process is to identify cultural resources that may be impacted by the project and then determine whether the resources are "historically significant" resources.

CEQA defines historically significant resources as "resources listed or eligible for listing in the California Register of Historical Resources (CRHR)" (Public Resources Code Section 5024.1). A cultural resource may be considered historically significant if the resource is 45 years old or older and possesses integrity of location, design, setting, materials, workmanship, feeling, and association.[1] In addition, it must meet any of the following criteria for listing on the CRHR:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or,
4. Has yielded, or may be likely to yield, information important in prehistory or history (Public Resources Code Section 5024.1).

Cultural resources are buildings, sites, humanly modified landscapes, traditional cultural properties, structures, or objects that may have historical, architectural, cultural, or scientific importance. A resource can also be determined historically significant under CEQA by virtue of being included in a local register of historical resources regardless of CRHR eligibility (see Title 14 California Code of Regulations Section 15064.5(a)(2)). CEQA states that if a project will have a significant impact on important cultural resources, deemed "historically significant," then project alternatives and mitigation measures must be considered. Additionally, the Office of Historic Preservation (OHP) may choose to comment on the CEQA compliance process for specific local government projects in an informal capacity but does not seek to review all projects that may affect historically significant cultural resources under CEQA provisions.

2.2 CALIFORNIA ASSEMBLY BILL 52

Signed into law in September 2014, California Assembly Bill 52 (AB 52) created a new class of resources – tribal cultural resources – for consideration under CEQA. Tribal cultural resources may include sites, features, places, cultural landscapes, sacred places, or objects with cultural value to a California Native American tribe that are listed or determined to be eligible for listing

[1] The Office of Historic Preservation (OHP) guidelines recognize a 45-year-old criteria threshold for documenting and evaluating cultural resources (assumes a 5-year lag between resource identification and the date that planning decisions are made) (OHP 1995:2). The age threshold is an operational guideline and not specific to CEQA statutory or regulatory codes.

in the CRHR, included in a local register of historical resources, or a resource determined by the lead CEQA agency, in its discretion and supported by substantial evidence, to be significant and eligible for listing on the CRHR. AB 52 requires that the lead CEQA agency consult with California Native American tribes that have requested consultation for projects that may affect tribal cultural resources. The lead CEQA agency shall begin consultation with participating Native American tribes prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report. Under AB 52, a project that has potential to cause a substantial adverse change to a tribal cultural resource constitutes a significant effect on the environment unless mitigation reduces such effects to a less than significant level.

2.3 IMPERIAL COUNTY GENERAL PLAN

2.3.1 Conservation and Open Space Element

The Conservation and Open Space Element of County's General Plan (County of Imperial 2016) contain one goal and one policy related to the protection and preservation of cultural resources. These include:

GOAL 3: Preserve the spiritual and cultural heritage of the diverse communities of Imperial County.

- Objective 3.1: Protect and preserve sites of archaeological, ecological, historical, and scientific value, and/or cultural significance.
- Objective 3.2: Develop management strategies to preserve the memory of important historic periods, including Spanish, Mexican, and early American settlements of Imperial County.
- Objective 3.3: Engage all local Native American Tribes in the protection of tribal cultural resources, including prehistoric trails and burial sites.

Cultural Resources Conservation Policy:

Identify and document significant historic and prehistoric resources, and provide for the preservation of representative and worthy examples; and recognize the value of historic and prehistoric resources, and assess current and proposed land uses for impacts upon these resources.

Programs

- The County will use the CEQA process to conserve cultural resources and conform to Senate Bill 18 "Consultation with Tribal Governments" and Assembly Bill 52 "Consultation with Tribal Governments". Public awareness of cultural heritage will be stressed. All information and artifacts recovered in this process will be stored in an appropriate institution and made available for public exhibit and scientific review.
- Encourage the use of open space easements in the conservation of high value cultural resources.
- Consider measures which would provide incentives to report archeological discoveries immediately to the Imperial Valley Desert Museum.
- Coordinate with appropriate Federal, State, local and tribal agencies to provide regular updates to the "Sensitivity Map for Cultural Resources" (Figure 6).

- Discourage vandalism of cultural resources and excavation by persons other than qualified archaeologists. The County shall study the feasibility of implementing policies and enacting ordinances toward the protection of cultural resources such as can be found in California Penal Code, Title 14, Point 1, Section 622-1/2. The County should maintain confidentiality of specific resource locations to prevent vandalism and desecration of sensitive cultural resources.

2.3.2 Renewable Energy and Transmission Element

Because the Project site lies within the County's Geothermal Overlay Zone, the Renewable Energy and Transmission Element of the General Plan also applies (County of Imperial 2015). The element contains several goals and associated objectives that are relevant to cultural resources. These include:

GOAL 1: Support the safe and orderly development of renewable energy while providing for the protection of environmental resources.

- Objective 1.1: The County of Imperial supports the overall goals of the Desert Renewable Energy Conservation Plan to provide a balance between the development of renewable energy resources while preserving sensitive environmental resources within its jurisdiction.
- Objective 1.2: Lessen impacts of site and design production facilities on agricultural, natural, and cultural resources.
- Objective 1.3: Require the use of directional geothermal drilling and "islands" when technically advisable in irrigated agricultural soils and sensitive or unique biological areas.
- Objective 1.4: Analyze potential impacts on agricultural, natural, and cultural resources, as appropriate.
- Objective 1.5: Require appropriate mitigation and monitoring for environmental issues associated with developing renewable energy facilities.
- Objective 1.6: Encourage the efficient use of water resources required in the operation of renewable energy generation facilities.
- Objective 1.7: Assure that development of renewable energy facilities and transmission lines comply with Imperial County Air Pollution Control District's regulations and mitigation measures.

GOAL 2: Encourage development of electrical transmission lines along routes which minimize potential environmental effects.

- Objective 2.1: To the extent practicable, maximize utilization of IID's transmission capacity in existing easements or rights-of-way. Encourage the location of all major transmission lines within designated corridors, easements, and rights-of-way.
- Objective 2.2: Where practicable and cost-effective, design transmission lines to minimize impacts on agricultural, natural, and cultural resources, urban areas, military operation areas, and recreational activities.

GOAL 8: Develop overlay zones that will facilitate the development of renewable energy resources while preserving and protecting agricultural, natural, and cultural resources. Development of overlay zones shall include coordination with Federal, State, County, Tribal governments, educational entities, the public and local industries.

- Objective 8.1: Allow for County review with appropriate development and performance standards for development of local resources within the overlay zones.
- Objective 8.2: Promote the exchange of information concerning renewable energy development to be circulated between industry, County staff, and the public.
- Objective 8.3: Provide the public adequate opportunity to obtain information on the current status of renewable energy development and to provide input on matters related to the development of renewable energy resources.

3.0 NATURAL AND CULTURAL SETTING

This section of the report summarizes information regarding the physical and cultural setting of the Project area, including the prehistoric, ethnographic, and historic contexts of the region. Several factors, including topography, available water sources, and biological resources, affect the nature and distribution of prehistoric, ethnographic, and historic-period human activities in an area. This background provides a context for understanding the nature of the cultural resources that may be identified within the region. Much of the information provided in the following sections has been adapted from a report compiled by PaleoWest entitled *Cultural Resources Inventory for the Border Fuels Reduction Project, Imperial and San Diego Counties, California* (Tennyson et al. 2022).

3.1 ENVIRONMENTAL SETTING

3.1.1 Physiography and Geology

The Project area is within the Colorado Desert of Imperial County, the largest and most arid subdivision of the Sonoran Desert and one of the hottest and most arid environments in the United States. The Project area is within the southern portion of a major physiographic and geologic feature of the Colorado Desert, the Salton Trough. The Salton Trough is an extensive topographic and structural depression extending from the Gulf of California about 130 miles northwest through the Coachella Valley to the summit of San Gorgonio Pass. The Gulf of California is separated from the trough by the roughly 11-meter tall (36 foot tall) delta of the Colorado River, which slopes gradually down to the north to about 69 meters (226 feet) below mean sea level (bmsl) at the Salton Sea, then rises gradually through the Coachella Valley. This feature evolved during the late Cenozoic Era as a result of tectonic forces that continue to the present day to separate the Baja California peninsula from mainland Mexico. These forces are manifested by numerous fault systems (including the San Andreas Fault) that have resulted in a deepening of the rift that, through the millennia, has contained bodies of either freshwater or saltwater. Intrusions of seawater into the rift first occurred during the late Cenozoic Era, during the Miocene and Pliocene epochs. Elevations within the Project area range from 5 feet bmsl to 10 feet above mean sea level (amsl). Most of the Project area is currently under agriculture.

Subsequently, during the early Pleistocene epoch, a growing alluvial fan of the Colorado River delta sealed off the upper portion of the rift from the sea, creating the Salton Trough basin. The lower portion became what is today the Gulf of California. After this division of the rift, flood episodes of the Colorado River would occasionally divert into the Salton Trough basin long enough to temporarily fill it with fresh water, creating a large lake known historically as Lake Cahuilla. Often, after episodes of flooding, the river eventually returned to its regular channel, into the Gulf of California and the lake would then gradually empty by evaporation. This cycle occurred several times during the Pleistocene and subsequent Holocene epoch. Lake Cahuilla, when full or even nearly full, would have encompassed the smaller present-day Salton Sea and covered much of the Imperial Valley, creating an extensive (but temporary) lacustrine environment (Apple et al. 1997; Schaefer 2006; Waters 1983).

Geologically, a sequence of marine, nonmarine, and lacustrine-associated geologic, sedimentary formations that extend deep beneath the Salton Trough document the geologic history of the rift described above. The Split Mountain Formation, deposited in the rift during the late Miocene epoch, consists primarily of nonmarine sediments of terrestrial (alluvial and colluvial) origin. At the beginning of the subsequent Pliocene epoch, marine sediments of the Imperial Formation began to be deposited atop the Split Mountain Formation, indicating the first marine transgressions into the rift depression (Dorsey et al. 2007). Later in the Pliocene, deposition of the nonmarine sediments contained in the Palm Springs and Canebrake Conglomerate formations indicate terrestrial contributions to the rift depression. Deposition of these latter two formations may have been at least partially contemporaneous with the deposition of the Imperial Formation marine sediments. Beginning possibly as early as the late Pliocene, the lacustrine sediments contained in the Borrego Formation indicate the end of marine deposition in the rift and the creation of the Salton Trough, and the presence in it of a freshwater lake. These sediments mostly overlie the Palm Spring and Canebrake Formations, but, in some instances, they appear to also interfinger with them, possibly indicating some contemporaneity with the deposition of these formations.

During the Pleistocene, deposition of the nonmarine Ocotillo Conglomerate Formation appears to have occurred contemporaneously with deposition of the lacustrine Brawley Formation. The contemporaneous deposition of these formations likely indicates that a Lake Cahuilla-like body of water was intermittently present in the Salton Trough basin during this period. These formations are subsequently overlain by Holocene-age lacustrine and alluvial deposits, indicating that these conditions continued throughout the period.

3.1.2 Climate and Hydrology

Conditions within the Colorado Desert are among the hottest found in the United States. Average daily temperatures typically range from the low 40 degrees Fahrenheit (°F) in winter to 105°F in summer, although summer temperatures can reach into the 120s°F (State Parks 1984). A high of 127°F was recorded at the Gold Rock Ranch station, approximately 15 miles northwest of Yuma. This region also experiences rapid heat loss at night, resulting in a wide daily temperature variance of approximately 30°F. Annual rainfall totals within the Colorado Desert are among the lowest in the Sonoran Desert, averaging less than 2 inches per year in the Salton Trough and between 2-4 inches along the Colorado River (Crosswhite and Crosswhite 1982), though recent summer monsoons have been known to produce more than the average yearly precipitation in a single rainfall event. Droughts of up to 60 days are not uncommon in this area, and the longest recorded drought lasted for more than three years, with documented rainfall of 0.01 inches (Jaeger 1957; Shreve and Wiggins 1964). Freshwater is found in the form of occasional springs and wells, and sporadically in the numerous seasonal drainages. It is thought that the climatic conditions at lower elevations of the Colorado Desert have remained much the same since the late Pleistocene.

The most significant hydrological feature in the vicinity of the Project area, given the criticality of water supply in the ecology, prehistory, and history of the Colorado Desert, is ancient Lake Cahuilla. Consequently, the implications of the periodic inundation of the Salton Trough will be described in more detail. As described previously, although it is generally accepted that freshwater inundations of the Salton Trough likely began during the Pleistocene epoch, it is documented that during the middle to Late Holocene epoch, Lake Cahuilla filled during natural episodes of Colorado River flooding, and then receded, several times before its last natural desiccation about 300 Before Present (B.P.) (Schaefer 1994, 2006; Waters 1983; Wilke 1978). During the Holocene, Lake Cahuilla formed in the Salton Trough when the Colorado River's major flood episodes breached a drainage divide near Cerro Prieto in northern Baja California. The resulting head-cutting diverted all or most of the Colorado River flow into the Salton Trough. Unchecked, the Colorado River flow would fill the trough to the 40-feet (12-meter) amsl contour, at which point an outflow channel was created. Flow into the trough presumably would have continued until siltation clogged the inflow channel. High evaporation rates would then cause the lake to recede and salinity to increase proportionally. Stands of Lake Cahuilla at the 40-foot (12-meter) amsl contour were truly huge, covering 2,201 square miles and reaching a maximum depth of 315 feet. Higher shorelines have been reported and dated to the Pleistocene (Waters 1983); however, it is not clear that any of these were associated with freshwater lakes resulting from Colorado River diversions.

3.1.3 Flora and Fauna

Creosote bush scrub is the most widespread natural vegetation type in the Sonoran Desert, and it covers large expanses of the Colorado Desert. Other natural plant communities also present in the general area include mesquite woodland, desert ironwood woodland, palo verde woodland, four-wing saltbush scrub, creosote bush-burrow weed scrub, brittle bush scrub, ocotillo scrub, and desert buckwheat scrub. The creosote bush scrub community is dominated by creosote bush (*Larrea tridentata*) and salt bush (*Atriplex canescens*) and occurs where the soil is more alkaline. Small shrubs include mesquites (*Prosopis* sp.), burrobush (*Hymenoclea salsola* var. *pentalepis*), desert ironwood (*Olneya tesota*), and desert broom (*Baccaris sarothroide*), with ocotillo sparsely present on alluvial fans (Shreve and Wiggins 1964). Larger drainages and washes support species of small trees and shrubs including western honey mesquite (*Prosopis glandulosa*), ironwood, and blue palo verde (*Cercidium floridum*), as well as species such as smoketree (*Psorothamnus spinosa*) (Bureau of Land Management [BLM] 2011:9.1071). Many of the plants in these various communities, including salt bush, mesquite, cactus, and buckwheat, were of economic importance to Native American people who occupied the area (Bean 1972; Bean and Saubel 1972).

The Colorado Desert is inhabited by a variety of faunal species that are well adapted to the dry and arid environment. Mammals commonly found in this region include kit fox (*Vulpes macrotis*), desert cottontail (*Sylvilagus audoboni*), and black-tailed jackrabbit (*Lepus californicus*), and an array of rodents such as white-tailed antelope squirrel (*Ammosphermophilus leucurus*), round-tailed ground squirrel (*Spermophilus tereticaudus*), desert and Merriam kangaroo rats (*Dipodomys merriami*), and desert pocket mouse (*Perognathus penicillatus*). Coyote (*Canis latrans*), desert bighorn sheep (*Ovis Canadensis nelson*), and Sonoran pronghorn antelope (*Antilocapra americana sonorensis*) are among the larger mammals. The most common bat species in this area is the California leaf-nosed bat (*Macrotus californicus*). This region is also populated by a variety of reptiles, such as the fringed-toed lizard (*Uma inornata, U. notate*), flat-tailed horned lizard (*Phrynosoma m'calli*), desert tortoise (*Gopherus cinctus*), chuckwalla (*Sauromalus obesus*), and desert iguana (*Dipsosaurus dorsalis*). Snake species that thrive in the Colorado Desert including the banded sandsnake (*Chilomeniscus cinctus*), sidewinder (*Crotalus cerastes*), and rosy boa (*Lichanura trivirgata gracia*).

3.2 PREHISTORIC CONTEXT

Schaefer (1994) was the first to develop a chronological sequence for the Colorado Desert area. The sequence he proposed strongly resembles the scheme in use for the San Diego region, while also incorporating archaeological information from the contiguous Mojave Desert region to the north. Schaefer's reliance on these two adjacent areas is in large part due to the well-defined cultural histories that have been developed for the Mojave Desert and San Diego regions. In contrast to these two areas, the basic culture history of the Colorado Desert region has not changed dramatically since pioneering archaeologist Malcolm Rogers (1939, 1945, 1966) published his initial impressions of the desert's chronology and cultural development, which it should be noted, also encompassed the San Diego region. Consequently, understanding the early prehistory of the Colorado Desert region still relies heavily on comparisons with, and information derived from, both the San Diego region and the Mojave Desert areas.

3.2.1 Paleoindian Period (ca. 12,000 to 10,000 B.P.)

The earliest well-documented prehistoric sites in Southern California belong to the Paleoindian Period (circa [ca.] 12,000–10,000 B.P.) during the Late Pleistocene. In the western United States, most evidence for the presence of Paleoindian peoples derives from finds of large-fluted spear and projectile points (Fluted-Point Tradition) found at sites associated with big game hunting. Paleoindian sites have been documented in places such as Clovis and Folsom in the Great Basin and the northern Desert Southwest area including the Mojave Desert (Moratto 1984:79–88). In the Mojave Desert, while absolute dating remains elusive, the Paleoindian Period is assumed to span approximately 12,000 to 10,000 B.P. (Sutton et al. 2007:234–236). Elsewhere in California, most of the evidence for the Fluted-Point Tradition derives principally from isolated occurrences of fluted points that have been found scattered across the state (Dillon 2002; Rondeau et al. 2007). Only isolated occurrences of fluted points have been observed in the Colorado Desert (e.g., Davis et al. 1980:150; Kline 2014) and in the San Diego area in mountains of southern San Diego County (Kline and Kline 2007). Some finds have also been made to the south in Baja California (Des Lauriers 2008; Hyland and Gutierrez 1995).

The beginning of the San Dieguito Tradition or Complex, which is associated with artifact assemblages distinct from that of the Fluted Point Tradition, is also assumed to date to the Paleoindian Period. In California (Alta California), this tradition has been documented mostly in the coastal area of San Diego County (Carrico et al. 1993; Rogers 1966; Warren 1966, 1967; Warren and True 1961); and to a lesser degree in the Mojave Desert (Sutton et al. 2007) and Colorado Desert (Rogers 1939, 1966; Schaefer 1994; Warren 1967). In the Mojave Desert, Sutton et al. (2007:236) assign the San Dieguito Complex to the early Archaic Period during the Early Holocene. Warren dates the San Dieguito Tradition as beginning circa 10,000 B.P. and ending sometime between 8500 and 7200 B.P. (Warren 1967, 1968:4; Warren and Ore 2011; Warren et al. 1998). It is characterized by an artifact inventory consisting almost entirely of flaked stone biface and scraping tools, but lacking the distinctive fluted points associated with the Fluted-Point Tradition. The subsistence system or emphasis of the San Dieguito Tradition, while not yet entirely agreed upon, appears to have been oriented towards hunting rather than gathering, based on the predominance of primarily hunting-associated tools in recovered artifact assemblages (Warren 1967, 1968).

Evidence for the Fluted-Point Tradition in the general vicinity of the Project area is minimal with only two isolated flute points have been identified in the Colorado Desert (Davis et al. 1980; Kline 2014) with a third point found in the mountains of San Diego County (Kline and Kline 2007). In contrast, the San Dieguito Tradition is relatively well-documented in the San Diego area. The most substantial evidence for this tradition derives from a stratified archaeological site, the

C.W. Harris Site (CA-SDI-149/316/4935B), in western San Diego County along the San Dieguito River. The Harris Site formed the original basis upon which the San Dieguito Tradition was defined (Rogers 1939, 1966; Vaughan 1982; Warren 1966, 1967, 1968; Warren and True 1961). Diagnostic artifact types and categories associated with the San Dieguito Tradition include elongated bifacial knives, scraping tools, crescentics, and Silver Lake and leaf-shaped projectile points (Carrico et al. 1993; Knell and Becker 2017; Rogers 1966; Vaughan 1982; Warren 1966, 1967; Warren and Ore 2011; Warren and True 1961). The C.W. Harris Site also provided the oldest calibrated radiocarbon date (9968 B.P.) found in association with a subsurface San Dieguito artifact assemblage (Warren and Ore 2011; Warren et al. 1998). Another slightly younger calibrated radiocarbon date of 9130 B.P. was also acquired from a San Dieguito-associated subsurface stratum at site CA-SDI-316 (Cooley 2013). Finally, possible evidence for the San Dieguito Tradition has been discovered at a site in the southern mountains of San Diego County; the site assemblage included complete, elongated bifacial knives and/or projectile points that bear a strong resemblance to some of those recovered from the C.W. Harris Site (Pigniolo 2005).

Although Rogers (1939, 1966) has described occurrences of sites and artifacts attributable to the San Dieguito Complex in the Mojave and Colorado Desert areas, the ability to accurately determine the antiquity of these artifacts and sites by radiometric dating methods has proven to be problematic (Schaefer and Laylander 2007:247; Sutton et al. 2007:237; Warren 1967:179). Consequently, the radiometric dating of the artifacts and their context at the C.W. Harris Site has for several decades, been the principal means of ascertaining the antiquity of these similar desert assemblages (Warren 1967). In the Mojave Desert area, the San Dieguito Complex has been largely subsumed under the Lake Mojave Complex (Sutton et al. 2007:236). Recently, calibrated radiocarbon dates from several Lake Mojave Complex associated sites have produced dates of similar antiquity to those from the C.W. Harris Site (Sutton et al. 2007:235) (i.e., ca. 10,000-9000 B.P.). In the Mojave Desert area, these Lake Mojave Complex sites are frequently associated with glacial lakes that were still present at the end of the Pleistocene and the beginning of the Holocene. Such glacial-related lacustrine features were generally not present in the more southerly Colorado Desert area. However, given the discovery of Paleoindian Period and/or Lake Mojave Complex associated projectile points in the Salton Basin (Apple et al. 1997; Wahoff 1999), it is possible that this basin, too, may have been inundated, at least periodically, during this earlier period.

3.2.2 Archaic Period (ca. 10,000 to 1,500 B.P.)

The Archaic Period (ca. 10,000–1500 B.P.) encompasses the interval between the relatively cool/wet conditions of the early Holocene and the appearance of assemblages characteristic of the Late Prehistoric. The Archaic Period is generally differentiated from the earlier Paleoindian Period by a shift from hunting-focused subsistence systems to a more generalized economy with an increased focus on gathering and the use of grinding tools and seed-processing technology. Consequently, typical artifact assemblages in the Mojave Desert—where sites dating to the early Archaic Period are common—contain dart points, but with increasing quantities of ground stone tools (such as manos and metates) occurring into the middle and latter parts of the period. As with the Paleoindian Period, little archaeological evidence has yet been encountered in the Colorado Desert area that can be definitely attributed to the early part of the Archaic Period (i.e., from ca. 8500–4000 B.P.) (Schaefer 1994:64; Schaefer and Laylander 2007:247). Although evidence of early Archaic occupation in the Colorado Desert has long been minimal—as noted above for the Paleoindian Period—possible evidence is the discovery of

Paleoindian Period and/or Lake Mojave Complex associated projectile points in the Salton Basin (Apple et al. 1997; Wahoff 1999) and at site CA-SDI-7074 in the mountains of southeastern San Diego County (Williams 2014), could change this paucity of evidence.

A possible early Archaic discovery in the Salton Basin occurred during an archaeological investigation at the Salton Sea Test Base (Apple et al. 1997; Wahoff 1999). This discovery consisted of an assemblage of large projectile points that were stylistically associated with early Archaic-style projectile points in the Mojave Desert, including Pinto and Elko styles. Although archaeological investigations did not obtain any radiocarbon dates to verify the relative dating evidence, the styles of these points appear to be associated with the early Archaic Period. More recently, excavations at site CA-SDI-7074, in the eastern foothills of the Laguna Mountains, uncovered more than 100 subsurface thermal features, many of which were likely earth ovens associated with agave roasting activity (Williams 2014). Although radiocarbon dating indicated that most of these oven features dated to the Late Prehistoric Period, five of the more deeply buried features were discovered to date between 9600 and 8590 B.P. These results not only indicate the use of agave as a food resource much earlier in time than was previously realized, but also suggest a reappraisal of the dating for the inception of the early Archaic Period in the area (Williams 2014:325). Additional evidence for an early to mid-Archaic Period use at the site includes the recovery of a single Elko-style projectile point (Williams 2014:151).

Limited evidence has been found for late Archaic (beginning ca. 4000 B.P.) occupation in the western Colorado Desert. One of the few studies that have documented use during this time was completed by Love and Dahdul (2002) in the northern Coachella Valley of the Salton Basin. The contexts of several sites in the Coachella Valley, some possibly associated with ancient stands of Lake Cahuilla, were radiocarbon dated to circa 3000-2000 B.P. (Love and Dahdul 2002; Schaefer and Laylander 2007:249). Other evidence for the late Archaic use in the area includes deposits found at the Indian Hill Rockshelter (CA-SDI-2537) in Anza-Borrego Desert State Park (McDonald 1992) and at another rock shelter in Tahquitz Canyon, near Palm Springs (Bean et al. 1995; Schaefer and Laylander 2007:247). The Indian Hill Rockshelter, until recently, was the oldest radiocarbon-dated archaeological site in the area. The site contained distinctive dart-sized projectile points, ground stone implements, rock-lined caches, and inhumations, one of which was radiocarbon dated to 4070±100 years B.P. (McDonald 1992; Schaefer 1994; Wilke and McDonald 1989). The rock shelter in Tahquitz Canyon, although lacking radiocarbon dates, exhibited an assemblage similar to that found in the Indian Hill Rockshelter (Bean et al. 1995; Schaefer and Laylander 2007:247).

Evidence for settlement patterning during the Archaic Period in the Colorado Desert area is minimal. However, some of the late Archaic sites in the Coachella Valley appear to have been in contexts associated with intermittent ancient stands of Lake Cahuilla (Love and Dahdul 2002). It seems likely, therefore, that this hydrological feature had a significant influence on settlement patterns in the western Colorado Desert during at least the late Archaic. Evidence of Archaic habitation at the Indian Hill and Tahquitz Canyon rockshelter sites indicate that adjacent mountain areas were also used by prehistoric groups during the middle to late Archaic.

3.2.3 Late Prehistoric Period (ca. 1,500 to 300 B.P.)

The Late Prehistoric and Protohistoric periods are represented in this region by the Patayan Complex. These periods date from approximately 1500 B.P. until the American expansion into the area at the turn of the nineteenth century. The Protohistoric Period encompasses a protracted 300-year-long period of sporadic European exploration and colonization that had little effect on aboriginal lifeways in the Southern California deserts.

Compared to those shifts noted for the middle and late Archaic Period, the changes occurring at the onset of the Late Prehistoric Period were rather abrupt. The magnitude of these changes and the short period of time within which they took place seem to indicate a significant alteration in subsistence practices ca. 1500–1300 B.P. The changes observed in the archaeological record in the San Diego area during the Late Prehistoric Period include: a shift in settlement patterning indicative of population increases; a shift from hunting using the atlatl and dart to using the bow and arrow; a reduced emphasis on shellfish gathering along some areas of the coast (possibly as a result of silting-in of the coastal lagoons); the introduction and production of pottery; an increase in storage of principal foodstuffs, such as mesquite, acorns, and piñon nuts; a shift in burial practices from inhumation to cremation; and, along the Colorado River, a change in economic and settlement patterns that involved subsistence expansion and the adoption of floodplain horticulture (Gallegos 2002; McDonald and Eighmey 1998; Schaefer 1994).

In the Coachella Valley and Salton Basin area, the Late Prehistoric Period is associated with the periodic infilling and emptying of Lake Cahuilla. This substantial hydrological feature is seen as recurrently altering the course of human settlement in the area during the period (Schaefer and Laylander 2007:250–251). During times of lake absence, settlement appears to have been characterized by the occupation of semi-sedentary villages along major water courses and around springs with adjacent montane areas seasonally occupied to exploit mesquite, acorns, and piñon nuts. Tahquitz Canyon in the mountainous area west of the Salton Basin has been documented as having been an important population center during the Late Prehistoric Period (Bean et al. 1995).

Schiffer and McGuire (1982:216–222) and Waters (1982a) used a chronology originally proposed by Rogers (1945) to divide the Late Prehistoric Period in the Colorado Desert area based on the progression or changes in development of ceramic types. Referring to the period as "Patayan" (instead of the term "Yuman," used by Rogers), three phases were defined that were correlated with fillings and desiccations of Lake Cahuilla. These phases include:

- Patayan I begins at approximately 1200 B.P. with the introduction of pottery into the Colorado Desert. Sites dating to this phase appear to be limited mostly to the Colorado River area.
- Patayan II coincides with an infilling of Lake Cahuilla around 950 B.P. As described previously, the lake covered much of the Imperial Valley and created an extensive lacustrine environment that is thought likely to have attracted people from the Colorado River area. New pottery types appear at this time as a result of local production along the lakeshore and technological changes in the Colorado River area. Subsequently, Lake Cahuilla experienced several fill/recession episodes before its final desiccation.
- Patayan III begins around 500 B.P. as the lake receded. Colorado Buff ware became the predominant pottery type during this time period across the Colorado Desert and along the Colorado River. Several Patayan II pottery types continue into the Patayan III (Waters 1982a, 1982b).

This chronological scheme has served as a useful tool for organizing archaeological assemblages in the area. However, Schaefer and Laylander (2007:252–253) noted that data obtained from more recent archaeological investigations highlight some serious discrepancies with its use (e.g., Hildebrand 2003).

As previously noted, the beginning of the Late Prehistoric Period in the San Diego County area is marked by the appearance of several new tool technologies and subsistence shifts in the archaeological record. Movements of people during the last two millennia can account for at least some of these changes. Yuman-speaking people have occupied the Gila and Colorado river drainages of what is now western Arizona at least 2000 years ago (Moriarty 1968); over time, these groups appear to have migrate westward through the Colorado Desert and the mountains of the Peninsular Ranges to the coast. An analysis by Moriarty (1966, 1967) of materials recovered from the Spindrift Site in La Jolla indicated a preceramic Yuman phase. Based on his analysis and a limited number of radiocarbon samples, Moriarty concluded that Yumans, lacking ceramic technology, migrated and occupied what is now the San Diego coastline circa 2000 B.P. Subsequently, by approximately 1200–1300 B.P., ceramic technology diffused into the coastal area from the eastern deserts. Although these Yuman speakers may have shared cultural traits with the people occupying what is now eastern San Diego County before 2000 B.P., their influence is better documented throughout present-day San Diego County after 1300 B.P. with the introduction of small points, ceramics, Obsidian Butte obsidian from the Salton Basin, and the practice of cremation of the dead.

Two distinct archaeological complexes have been proposed for the Late Prehistoric Period in what is now San Diego County. The Cuyamaca Complex is based on analysis by True (1970) of archaeological excavations undertaken in the Cuyamaca Rancho State Park and analysis of archaeological collections at the San Diego Museum of Man. Results of his analysis, True (1970) was able to define a Late Prehistoric Period Complex for southern San Diego County. This complex differs from the San Luis Rey Complex, which Meighan (1954) identified in the northern portion of the county. The two complexes are primarily differentiated by the presence or absence, or differences in the relative occurrence, of certain diagnostic artifacts in site assemblages. For example, Cuyamaca Complex sites generally contain both Cottonwood Triangular-style and Desert Side-notched arrow points, while Desert Side-notched points are quite rare or absent in San Luis Rey Complex sites (Pigniolo 2001). Other examples include use of Obsidian Butte obsidian, which is far more common in Cuyamaca Complex sites than in San Luis Rey Complex sites and ceramics. While ceramics are present during the Late Prehistoric Period throughout the region, pottery occurs earlier in time and appears to be somewhat more specialized in form at Cuyamaca Complex sites. Burial practices at Cuyamaca Complex sites are almost exclusively cremations, often in special burial urns for interment. In contrast, archaeological evidence from San Luis Rey Complex sites indicates use of both inhumation and cremation. Based on ethnographic data, it is now generally accepted that the Cuyamaca Complex is associated with the Yuman Diegueño/Kumeyaay and the San Luis Rey Complex with the Shoshonean Luiseño/Juaneño.

Compared to Archaic Period sites, Late Prehistoric Period sites attributable to the San Luis Rey or Cuyamaca complexes, while not absent, are less common in the near-coastal areas of the county. As noted by Gallegos (1995:200):

> "for San Diego County, there is temporal patterning, as the earliest sites are situated in coastal valleys and around coastal lagoons. Late Prehistoric Period sites are also found in coastal settings but are more common along river valleys and interior locations."

In contrast, numerous Late Prehistoric Period sites, attributable to the San Luis Rey or Cuyamaca complexes, have been identified in the inland foothill areas of the region (e.g., Carrico and Cooley 2005; Chace and Hightower 1979; Cooley and Barrie 2004; McCown 1945; McDonald et al. 1993; Raven-Jennings and Smith 1999; Willey and Dolan 2004).

3.2.4 Ancient Lake Cahuilla and Obsidian Butte

Wilke (1978:90-93) initially posited three lacustrine intervals in the Salton Trough representing an unknown number of stands of Lake Cahuilla during the past 2,100 years. Waters (1983) subsequently refined Wilke's original estimates of the lacustrine intervals and suggested that there had been four lacustrine intervals that reached the 12-m amsl shoreline during the last 1,500 years (Waters 1983:382-385). The results of additional archaeological research suggest that a fifth, more recent lacustrine interval of Lake Cahuilla occurred sometime between the Spanish explorations of the region in A.D. 1540 and 1775. Radiocarbon dating indicates that this high stand probably occurred between approximately A.D. 1685 and 1740 (Cleland 1999:13).

The Lake Cahuilla chronology, in calendar years before present (cal B.P.; before A.D. 1950), corrected for variations in radiocarbon, is as follows:

- Lacustrine Interval 5: 330-270 cal B.P.;
- Lacustrine Interval 4: 520-370 cal B.P.;
- Lacustrine Interval 3:740-580 cal B.P.;
- Lacustrine Interval 2: 1010-740 cal B.P.;
- Lacustrine Interval 1: 1250-1010 cal B.P.

It should be noted that the dates for the duration of the lake high stands represent maximum spans. The stratigraphic record reveals that the next oldest lacustrine intervals are associated with radiocarbon assays from two distinct sedimentary strata dating to approximately 2285 and 2300 cal B.P. Stratigraphic evidence indicates that there were no episodes of filling of Lake Cahuilla between about 2300 and 1250 cal B.P. (Waters 1983).

Each interval of filling the empty basin or evaporating all the impounded water likely occurred over several decades. As such, it is likely that during much of the past 2,300 years, the lake was neither full nor empty, but rather rising or falling between 84.8 meters bmsl and 12-meters amsl. A salient implication of this vertical dynamism is that the areal extent of Lake Cahuilla was highly variable over time. Native American settlement likely have shifted as the shoreline advanced or retreated. This variability in lake elevations is also important for determining when volcanic glass was available from the Obsidian Butte source. In late prehistoric times, especially after 950 B.P., toolstone from Obsidian Butte was widely used in Southern California. However, the source was inundated at its glass inaccessible whenever Lake Cahuilla's surface elevation was higher than 40 meters bmsl (Schaefer and Laylander 2007). Expanding or receding, the lake would have prevented access to Obsidian Butte glass whenever the water level stood between 40 meters bmsl and 12 meters amsl. Ethnographic testimony attests to the importance of Obsidian Butte as a primary source of volcanic glass and a place of special importance to many local native populations persists to this day (Gates and Crawford 2010).

3.3 ETHNOGRAPHIC CONTEXT

Schaefer (2006:21) has previously indicated that the location of the Project area is in a boundary area of the traditional territories of two tribal groups, the Yuman-speaking Tipai (Kamia) to the south and the Shoshonean-speaking Cahuilla to the north (Schaefer 2006:21). Schaefer's use of the term "Tipai" has evolved in the literature, through time, as the one applicable to the people living in the area of eastern San Diego and Imperial counties.

The general early term applied for the Yuman-speakers in the area was "Diegueño," from the mission with which they came to be associated, the San Diego Mission de Alcalá. This term was later adopted by anthropologists (e.g., Kroeber 1925) and further divided into the southern and northern Diegueño. Subsequently, Shipek (1982) initiated the use of a Yuman language term, "Kumeyaay," for the people formerly designated as the Diegueño. According to Carrico (1998:V-3):

> "The linguistic and language boundaries as seen by Shipek (1982) subsume the Yuman speakers into a single nomenclature, the Kumeyaay, a name applied previously to the mountain Tipai or Southern Diegueño by Lee (1937), while Almstedt (1974:1) noted that 'Ipai applied to the Northern Diegueño with Tipai and Kumeyaay for the Southern Diegueño. However, Luomala (1978:592) has suggested that while these groups consisted of over 30 patrilineal clans, no singular tribal name was used and she referred to the Yuman-speaking people as 'Ipai/Tipai…"

Other researchers designated the Kumeyaay living north of the San Diego River as 'Ipai (Northern Diegueño) and those living south of the river and into Baja California as Tipai (Southern Diegueño) (Hedges 1975:71–83; Langdon 1975:64–70). Gifford (1931) designated the Kumeyaay living in the eastern San Diego and Imperial counties as the Kamia, who were distinguished by a desert orientation, with contacts and travel most frequently between eastern San Diego County and the Imperial Valley. This term has generally been replaced with the designation of eastern Kumeyaay or Tipai (Gifford 1931:2; Hedges 1975; Langdon 1975; Luomala 1978). Recently, however, Schaefer (2006:25) stated that:

> "The Kamia specifically were also directly related to the Tipai (southern Kumeyaay) of the mountains and coastal areas of San Diego County and northern Baja California. Their dialect, however, is closely related to the Cocopah and other delta Yumans."

According to Schaefer (2006:21), the Tipai (Kamia) and the Cahuilla "consider the cultural resources of the general area as part of their cultural and historical legacy." As such, both groups are described herein.

3.3.1 Cahuilla

The Cahuilla are a subgroup of the Takic family of the Uto-Aztecan stock and are therefore closely related linguistically to other "Shoshonean" speaking groups including the Gabrielino, Luiseño, and Serrano. These Takic-speaking groups are thought to represent a migration into the area occurring approximately 1500 B.P. (Schaefer 2006:21). According to Schaefer (2006:22):

> What role these Takic speakers had in the development of the Patayan pattern in the Colorado Desert remains unclear, although it may have been considerable. The ancestors of the Colorado River Yumans are most often identified as the source of ceramics, cremation practices, agriculture, some architectural forms, and some stylistic and symbolic representations. The Takic migrations may coincide with the introduction of bow-and-arrow technology, but no direct association can be made. They may have contributed specific hunter and gatherer techniques as well as cosmological and symbolic elements to the Patayan cultural system.

The diversity of Cahuilla territory reflects the range of environmental habitats in inland Southern California. Topographically, their territory ranged from the summit of the San Bernardino Mountains to the Coachella Valley and Salton Sink. Ecological habitats included the full range of mountains, valleys, passes, foothills, and desert areas. Villages were typically situated in canyons or on alluvial fans near water and food resources, and a village's lineage owned the immediately surrounding land (Bean 1972). Well-developed trails were used for hunting and travel between settlements. Village houses ranged from brush shelters to huts 15–20 foot long. Important plant foods exploited from the Cahuilla's diverse habitat included mesquite and screw beans, piñon nuts, and various cacti. Other important plant foods included acorns, various seeds, wild fruits and berries, tubers, roots, and greens. Women were instrumental in the collection and preparation of vegetal foods.

Cahuilla settlement and subsistence patterns were impacted by fill and recession episodes of Lake Cahuilla. When the lake was present, the desert area becoming a more productive resource area. Schaefer (2006:22) states that "Cahuilla mythology and oral tradition also indicate that when Lake Cahuilla dried up, it was the mountain people who resettled the desert floor. The time of Lake Cahuilla is also best documented in the oral traditions of the Cahuilla, both with regard to settlement patterns, song cycles, and the effects of Lake Cahuilla on patrilineal clan segmentation." According to Strong (1929:36) "The derivation of the term Cahuilla is obscure, and it is regarded by the Indians to be of Spanish origin."

The earliest Spanish contact with the Cahuilla may have been with the Juan Bautista de Anza expedition trips in 1774 and 1777. The route followed San Felipe Creek adjacent to Carrizo Creek and then through Borrego Springs, up into the San Jacinto Mountains (Pourade 1962:164; Schaefer 2006:23). The impact of the Spanish mission system and colonization was much less immediate and profound among the Cahuilla compared to Native American groups residing along the coast. It was not until 1819, after the establishment of the San Bernardino estancia and cattle ranch at San Gorgonio, that a more direct Spanish influence was felt. By 1823, members of the Romero Expedition documented that the Cahuilla at Toro were growing corn and melons and were already familiar with the use of horse and cattle, indicating a familiarity with Hispanic practices (Bean and Mason 1962).

During the Spanish Period and into the Mexican Period, political leadership became more centralized as Juan Antonio from the Mountain Cahuilla and Chief Cabazon in the desert emerged as central figures (Strong 1929). Juan Antonio's group played a significant role during the Mexican American War, siding with the Mexicans against the Luiseño who supported the American invasion (Phillips 1975). Along with the rise of powerful chiefs and political restructuring, Mexican language, clothing, and food were incorporated into traditional culture during this era.

With the 1848 signing of the Treaty of Guadalupe Hidalgo, the U.S. Government promised to preserve the liberty and property of the inhabitants of California. In 1952, a treaty was drafted to settle land rights issues for the Cahuilla (as well as Serrano and Luiseño). The treaty was never ratified by Congress and the best farming and grazing lands were claimed by Euro-American settlers. In addition, Executive Orders enacted in the 1960s and 1970s resulted in the establishment of reservations that substantially reduced Cahuilla land. The result of these orders created a checkerboard of 48 sections of reservation lands spread across the eastern edge of the Santa Rosa and San Jacinto mountains and the Coachella Valley (Cultural Systems Research, Inc. [CSRI] 1983). Although various modifications have occurred over time, this has remained the permanent home of the Cahuilla to date.

3.3.2 Tipai/Iipai (Kamia)/Kumeyaay

The Tpai-Iipai/Kumeyaay were also hunter-gatherers who seasonally altered between the mountainous western portions of their territories and the eastern desert areas to maximize resource exploitation. Similar to the Cahuilla, the lifeways of the Tpai-Iipai/Kumeyaay were impacted by the fill and recession of Lake Cahuilla. Schaefer (2006:26) states that "Lake Cahuilla figures prominently in the Kamia's origin myth (Gifford 1931:75–83) and except for the Cahuilla, represents the only other major recorded oral tradition regarding the ancient lake." The Tipai/Kamia were closely connected to the Quechan on the Colorado River and served as trading partners between the coastal and desert groups, using a travel route through the Mountain Springs Grade. These trading partners also were frequently politically allied against other groups to the north and south (Cook et al. 1997:9). The earliest Spanish contact may have been in 1785 by Pedro Fagés or during the Anza expedition journeys in 1774 and 1777 (Cook et al. 1997; Schaefer 2006). By this time, the Tpai-Iipai/Kumeyaay were hostile to the Spaniards and were in alliance with other groups, actively resisting Spanish rule in the area. In 1775, this resistance culminated in open revolt when tribal members from at least 14 local villages banded together and attacked, and burned, the Mission San Diego de Alcalá (Carrico 2008:32–33). The Tipai-Iipai/Kumeyaay continued to resist European and Anglo rule through the Mexican Period and into the American Period.

Although Mexico's governance of Alta California did not last long, it did help to cement the changes brought by the Spanish missionization and colonization of the area. One major alteration occurred in 1835 when the missions were secularized, and their large land holdings were made available to private citizens. Although some large grants of land were made prior to 1834, secularization of the mission's large grazing holdings ushered in the Rancho Era.

One impact was the dissolution of the mission as a residential and labor center for territorially disenfranchised Native Americans. Many mission neophytes had little option but to work on the new Mexican ranchos. Communities living farther from the ranchos were able to maintain their traditional lifeways for a bit longer. New ranches put new pressures on California's native populations, as grants were made in inland areas still occupied by the Kumeyaay, forcing them to acculturate or relocate farther into the backcountry. In rare instances, former mission neophytes were able to organize pueblos and attempt to live within the new confines of Mexican governance and culture. The most successful of these pueblos was the Pueblo of San Pasqual, located inland along the San Dieguito River Valley, founded by Kumeyaay who were no longer able to live at the Mission San Diego de Alcalá (Carrico 2008; Farris 1994).

During the American Period, railway systems began to connect the people and products of Southern California to the rest of the United States. Increased American settlement and claims on the land for residential, mining, agricultural, and ranching purposes in the second half of the nineteenth century meant that many remaining lands sustaining Native American populations were marked, surveyed, or even fenced as private, again changing the landscape of what are now San Diego and Imperial counties. Native American reservations were established, ostensibly to provide land for Native American populations, but these holdings made available only the poorest of subsistence lands and forced many indigenous peoples to adopt a more sedentary lifestyle, reliant on the Anglo economic system as an alternative to moving to reservations (Carrico 2008).

3.3.3 Quechan

According to Quechan oral tradition, their territorial range extended along the Colorado River from Blythe in the north to Mexico in the south. At the time of sustained European contact in the seventeenth century, the Quechan people numbered in the thousands. The largest concentration of Quechan traditionally lived at the confluence of the Colorado and Gila rivers, although they were strangely not reported in that area in 1540, when the Alacon and Diaz expeditions reached the confluence (Forbes 1965; Forde 1931). Nevertheless, in the following century, large Quechan villages existed in the area.

The Quechan economy was based on a combination of horticulture, fishing, and gathering. During the winter and spring, Quechan groups lived in seasonal village settlements located on terraces above the river floodplain. After the spring floods receded, small family groups dispersed to their agricultural plots along the river to plant crops. After the harvest in the fall, the Quechan gathered again in the large villages on the terraces, where stored agricultural foods, fishing, and limited gathering allowed them to live together through the winter (Bee 1983; Forde 1931). In all times but high flood, fishing in the Colorado River provided an important source of protein.

Numerous named villages were located along the terraces above the lower Colorado River flood zone. The village known as *Avi Kwotapai* was located on the west side of the Colorado River between Blythe and the Palo Verde Valley, and *Xenu mala vax* was on the east side of the river near present-day Ehrenhberg (Bee 1983). Quechan and other Yuman-speaking groups report well-traveled trails that extend along the Colorado River, as well as trail networks between peaks and other significant landscape features (see discussions in Cleland and Apple 2003). Primary ethnographic sources for the Quechan include Bee (1983), Castetter and Bell (1951), and Forde (1931).

The contemporary Quechan community is concentrated in the lands of the Fort Yuma-Quechan Reservation and has its main headquarters in Fort Yuma, Arizona. The reservation is approximately 45,000 acres and is located along the lower Colorado River in both Arizona and California just north of the United States/Mexico border.

3.4 HISTORIC CONTEXT

The history of the region is generally divided into Spanish (1769–1821), Mexican (1821–1846), and American (1846–present) periods. The Spanish Period is marked by the establishment of a mission and presidio on a hill overlooking San Diego Bay in July 1769. The Spaniards introduced European crops, cattle, and other livestock. The Mexican Period began in 1821 when Mexico achieved independence from Spain. During the 1820s, a small village began to form at the base of Presidio Hill that became the Pueblo of San Diego (present-day Old Town). The town served as a market center and port for numerous ranchos in the region that were chiefly employed in cattle raising for the exportation of hides and tallow. In 1846, San Diego was occupied by American troops and officially became part of the United States when the Treaty of Guadalupe Hidalgo formalized the transfer of territory from Mexico to the United States in 1848.

European contact with coastal southern California began as early as 1542, with the voyage of Juan Rodríguez Cabrillo. However, intensive interactions and contacts with interior areas only came after the establishment of the Spanish presidio and mission of San Diego in 1769. During the Spanish Period, exploratory probes into eastern San Diego County were made by Pedro Fagés and others, and the southern immigrant trail came into use by colonists from Sonora. Mission culture may have begun to impact Native culture residing in the vicinity of the Project area.

In the 1800s, most travel from Arizona to San Francisco by Mexican soldiers, and later by American settlers, followed Anza's route. While the historic activity in the area during the early nineteenth century was limited primarily to travel with little settlement or resource exploitation, more intensive activity began in the 1820s, with the onset of limited placer mining in the eastern Colorado Desert. Early Spanish prospectors named the Cargo Muchacho ("loaded boy") Mountains after the gold they found there.

Mexico obtained independence from Spain in 1821. Soon thereafter, California's administrators began to shift their focus away from the Franciscan mission system and toward Hispanic lay settlement of the province. Avenues for foreign trade were opened, and private land grants became more numerous and extended farther inland from the coast.

During the Mexican American War of 1846–1848, California was occupied and subsequently annexed by the United States (U.S.). From the 1840s through the 1880s, the U.S. Cavalry established a series of camps and forts throughout Arizona, Nevada, and the California desert to protect settlers and immigrants from hostile tribes (Rice et al. 1996). Land ownership was complicated by this transition. The Treaty of Guadalupe-Hidalgo, signed in February 1848, obligated the U.S. Government to recognize legitimate land claims in Alta California. While Mexicans initially made up most of the population, the Gold Rush after 1849 stimulated large-scale immigration into the region. Despite large land holdings and a strong cattle industry, many Mexican landowners found themselves overextended when the northern California miners' demand for meat dwindled. To pay their taxes and bills, some were forced to offer up their lands at public auction (Garcia 1975:22). Small farmers had difficulty maneuvering through the process and acquiring land (Garcia 1975:16). Settlers increasingly squatted on land that belonged to Mexicans, citing their preemption rights, which was the tradition that squatters had the first opportunity to buy the unimproved, unclaimed land for a fair price before auction (Garcia 1975:22). Squatters increasingly challenged the validity of Spanish-Mexican claims through the Board of Land Commissioners created by the California Land Claim Act of 1851 (Garcia 1975:22-23). Most Californios did not retain their original land holdings by 1860, including Santiago Arguello, who was granted the former Mission San Diego land in 1846 and eventually lost $24,000 in property (Garcia 1975:24).

Following the establishment of forts throughout the area, the California desert region again opened for exploration and settlement. As part of an effort to establish a railroad route from St. Louis to the Pacific Ocean, the U.S. Government conducted a series of surveys between 1853 and 1855 to identify feasible routes. One of the railroad survey parties, led by Lieutenant R.S.

Williamson, included a young geologist, William Phipps Blake, who was the first to identify the Salton Trough as an ancient lake bed (Cory and Blake 1915; Rice et al. 1996) and recognized the fertility of the basin. Sporadic flooding occurred at least eight times from 1824 to 1904. It was during this time that the 1856 U.S. Government Land Office survey documented several historic trails within the region, as well as the Tipai settlement at San Sebastian Marsh (Warren et al. 1981; Warren and Roske 1981).

By 1860, most of the land in San Diego region was unimproved farmland and some ranches (Garcia 1975:15). Settlement of the area occurred through homesteading primarily, which was authorized by the Homestead Act during the Civil War. The Timber Act, passed in 1873, also spurred settlement. It required a 10-year cultivation period of healthy trees. Some speculators and ranchers used this law as a way to obtain land for purposes other than what the patent stated. In the 1870s and 1880s, small farming communities were quickly established throughout San Diego County as settlers took up homestead claims on government land or small holdings purchased from real estate developers.

Significant economic development of the Colorado Desert region began in the 1870s and came to fruition in the early part of the twentieth century. Development was dependent largely on transportation and the availability of potable water. The first of these came in 1872 with the construction of the Southern Pacific Railroad from Los Angeles to present-day Indio, and eventually to Yuma. The early townsite of Indio, the midpoint between Los Angeles and Yuma, was created to provide living quarters for train crews and railroad workers. The first trains ran on May 29, 1876 (Pittman 1995:36). The Southern Pacific continued east, paralleling an 1857 road along the eastern side of the Salton Trough. Railroad stops were built at Walters (now called Mecca), Woodspur (Coachella), and Thermal, among others. The same large dunes that had hindered de Anza's expedition hindered construction of the railroad.

The Southern Pacific Railroad was finally forced to build along the eastern edge of what came to be known as the Imperial Sand Dunes. Railroad sidings in the area with names such as Glamis, Amos, and Ogilby developed into small company towns. The second Transcontinental Railroad was completed when the Southern Pacific and Atchison, Topeka, and Santa Fe Railroads were linked at Deming in New Mexico Territory on March 8, 1881, providing settlers relatively quick and easy access to the region. The citizens of Imperial Valley petitioned the Southern Pacific Company to build a branch line south, connecting the valley to the main Southern Pacific Railroad. In 1903, the line was completed from Old Beach (Niland) to Imperial. By 1904, the line had been extended to Calexico (Heath 1945). A branch line ran from El Centro to Seeley, connecting the Southern Pacific to the San Diego and Arizona Eastern Railroad (Farr 1918). The San Diego and Arizona Eastern Railroad ran from 1919 to 1983, connecting San Diego and Imperial Counties (Crawford 2010).

The completion of the railroad resulted in an unprecedented real estate boom for the city and county of San Diego. The population of San Diego swelled by 700 percent from 5,000 in 1885 to 40,000 in 1889 (Hector et al. 2004:18). Most of the growth was concentrated in the coastal areas and adjacent inland valleys, west of the present Project area, but Imperial County began to experience significant development during the first decade of the twentieth century, with the inauguration of an irrigation system tapping the waters of the Colorado River.

3.4.1 Imperial County

The County of Imperial was founded on August 15, 1907. It was the last county to be organized in California and measures 4,087 mi^2 in area (O'Dell 1957:8). Largely unoccupied by Euro-Americans through much of the early nineteenth century, the historic development of the western portion of the Imperial County has been influenced by three major water bodies. These include the Salton Sea, the Alamo River, and the New River, the latter of which lies less than one mile southwest of the Project area. All three landforms lie are the result of a manmade accident that occurred between 1905 and 1907. A discussion of each of these geographic features is provided below.

Beginning in the early twentieth century, population in the county began to increase with the completion of the Alamo Canal, which directed water from the Colorado River, into Mexico, and back into California (O'Dell 1957:87-88). By 1905, there were about 67,000 irrigated acres farmed by recent settlers to the valley (Bright 1998:70; Hendricks 1971:8). Over the next twenty years, many farmers moved into the county, drawn by the growing agricultural industry, which took off with the construction of the Hoover Dam in 1936 and the All-American Canal in 1940.

Cotton became a major industry in the vicinity of the Project area with 50,000 acres of land in the county devoted to its cultivation in 1914 (McGroarty 1914:27). Alfalfa was another important crop, but as production exceeded demand, it became too expensive to export. As a result, dairy farming became a growing industry, with 2,000 dairies opening in the valley to make use of the surplus alfalfa (Anderholt 1989:53). Historically, most of the land within the Project area has been owned by small-scale farms, some of which have been in operation since the early twentieth century (see Section 3.4.3 below). Although Imperial County is rich in a variety of mineral resources (e.g., clays, gypsum, and marble), mining does not appear to have developed as an important industry in the Project area.

3.4.2 Salton Sea

The Salton Sea is in the location of the historic Lake Cahuilla, which the Colorado River periodically emptied for centuries (San Diego Union-Tribune 2015). In 1905, high spring flooding on the Colorado River spilled over a California Development Company canal, overflowing through the Alamo channels, and flooding the Imperial Valley. The entire volume of the Colorado River rushed down into the Salton Sea until engineers were able to stop the flow of water in 1907, two years after the initial breach. By this time, the Salton Sea was a 400 square meter body of water – larger than Lake Tahoe (Picone 2021)

The Salton Sea is an endorheic lake, which means the waters never discharge into the ocean and either seep into the earth or evaporates. As a result, the lake has a higher saline level than the Pacific Ocean and is constantly increasing in salinity from evaporation (Picone 2021). While the saline levels were lower in the 1950s and 1960s, the Salton Sea was a popular tourist destination where millions of visitors would come to the warm waters every year, sometimes drawing more tourists than Yosemite (Picone 2021). In the 1950s, the California Department of Fish and Game stocked the lake with fish in a successful effort to draw fisherman. A yacht club opened, and many high-profile Hollywood stars visited, including Sony Bono, who learned how to water ski on the sea (San Diego Union-Tribune 2015). By the 1970s, tourism came to a halt as rising salinity, shoreline flooding, and fertilizer runoff from nearby farms caused algal blooms and elevated bacterial levels. This caused a mass-die-off of the sea's fish, and in turn, the local bird populations (Picone 2021). Today, the Salton Sea remains a busy stopping spot for migratory birds. The main tourist draw is the Sonny Bono Salton Sea National Wildlife Refuge (NWR) on the southeastern shores of the Salton Sea. As many as 25,000 visitors a year visit the NWR each year for recreational purposes (San Diego Union-Tribune 2015).

3.4.3 Canal System

The Alamo Canal, completed in 1901 by the California Development Company, was the first canal to serve Imperial County. By 1905, Imperial County had 80 miles of canals and 700 miles of distribution canals. Most of the water was redirected from Colorado River, providing water to 12 water districts that served Imperial Valley. Prior to 1936, the water supply for the Imperial Valley was silt laden. The canal system quickly became clogged and dredging the system was difficult and expensive. The California Development Company did not have the financial resources to keep the system clear. As described above, construction of a new control gate in 1905, coinciding with unusually heavy floods, led the Colorado River to overflow its banks and flood the Imperial Valley. A total of 13,000 acres of irrigable land was destroyed as a result with and an additional 30,000 acres left without a water supply. All crops were lost and by 1909, the California Development Company was bankrupted.

The Imperial Irrigation District (IID) was formed in 1911 under a state charter to acquire properties of the bankrupt California Development Company. By 1922, the IID had acquired 13 water companies and between 1930 and 1940, the All-American Canal (AAC) was built to replace the Alamo Canal (Dowd 1956:88). The AAC provided reliable water to the valley from the Colorado River and by 1942, became the sole source of imported water for the Imperial Valley. Today, approximately 1,667 miles of canals and laterals distribute irrigation water within IID’s service area (Bureau of Reclamation n.d.).

Three major distribution canals channel water throughout the Imperial Valley: East Highline (EHL), Central Main (CM), and Westside Main (WSM) (CH2M Hill 2001). The three canals service different portions of the valley: the EHL serves IID’s area east of the Alamo River, the CM Canal serves the area between the Alamo River and the New River; and the WSM serves the area west of the New River. The CM Canal branches from the AAC near the town of Calexico and runs northward through the central portion of the IID. Following its construction, a network of irrigation laterals was constructed off the CM Canal, most of which run northward. The CM Canal system has one associated reservoir, the Fudge Reservoir, that is located near Brawley.

One of the largest laterals that is associated with the CM Canal is the Dogwood Canal. Branching off the CM Canal near Highway 111, the canal runs west paralleling the CM Canal for approximately 2.5 miles before turning north and continuing along Dogwood Road for a distance of 10.3 miles. An approximately 0.7-mile-long portion of the canal within the city of El Centro runs through an underground pipeline. Although the date of construction of the canal is not known, historical maps indicate that it was operational as early as the 1910s (USGS 1915).

The irrigation water that is transported through the CM Canal system drains into New River, which flows west and north from the Mexicali Valley in Baja California to the Salton Sea. The modern river course was created in 1905-1907 by high spring flooding on the Colorado River. Washing out portions of the Alamo Canal, the flood water coursed into the Salton Basin and created the New River channel (Dowd 1956:35). The New River eventually became one of the main outlets to the Salton Sea with extensive drainage systems constructed by the IID in the early decades of the twentieth century (Dowd 1956:36).

Within the Project vicinity, much of the land south of the CM Canal is irrigated by a series of lateral canals originating off the Beech Canal. The Beech Canal is a 6.5-mile-long structure that diverges from the CM Canal in Calexico and drains into the New River. Historic topographic maps indicate that the canal and its laterals were built between 1907 and 1915 (USGS 1907 and 1915). A drainage system associated with the Beech Canal appears to have been built by the IID sometime in the late 1920s or 1930s (Dowd 1956:70-71).The Beech Drain runs along the southern edge of the CM Canal in a westward direction for a distance of approximately 1.5 miles to empty into the New River.

4.0 CULTURAL RESOURCES INVENTORY

PaleoWest conducted an in-person records search at the SCIC, housed at San Diego State University, on February 1, 2023. This inventory effort included the Project area along with a corresponding one-mile buffer, collectively termed the records search area. The objective of the SCIC records search was to identify prehistoric and historical cultural resources that have been previously recorded within the records search area during prior investigations.

As part of the cultural resources inventory, PaleoWest staff also conducted archival research to characterize the developmental history of the Project area and Native American outreach to obtain information on Native American cultural resources within the immediate vicinity of the Project area. A summary of the results of the record search and background research is provided below.

4.1 PREVIOUS CULTURAL RESOURCE INVESTIGATIONS

The data review indicates that no fewer than 35 previous investigations have been conducted and documented within one mile of the Project area since 1976 (Table 4-1). Six of these studies (IM-0063, IM-00066, IM-00115, IM-00123, IM-00235, and IM-1306) encompassed portions or the entirety of the Project area. Many of the prior studies were associated with proposed geothermal developments. None of these previous investigations identified any cultural resources within the current Project area. A summary of the prior cultural studies is provided in Appendix A.

4.2 CULTURAL RESOURCES REPORTED WITHIN THE STUDY AREA

The review of the record search data indicate that six cultural resources have been previously documented within one mile of the Project area (Table 4-2). All these resources date to the historic period and include the mapped locations of telegraph poles, railroad segments, an irrigation feature, and a pool facility. No prehistoric archaeological resources were identified within the record search area and none of the previously documented resources are located within or immediately to the Project area. A summary of the previously recorded resources in the record search area is provided in Appendix A.

4.3 ADDITIONAL SOURCES

4.3.1 Historical Maps and Aerial Imagery Review

Historical maps consulted as part of the background research include the BLM's General Lands Office (GLO) survey plat maps (1856 and 1880) and the *Holtville,* CA (1907) and El *Centro, CA* (1915, 1942, 1954, 1955, 1958, 1961, 1964, and 1989) 30-minute, *Heber, CA* (1940, 1943, and 1957a) 15-minute, and *Heber, CA* (1957b and 2012) 7.5-minute USGS topographic quadrangles. Aerial photographs available at NETROnline (2023) dated 1953, 1984, 1996, 2002, 2005, 2009, 2010, 2012, 2014, 2016, 2019, and 2020 were also reviewed.

Table 4-1 Previous Cultural Studies within One Mile of the Project Area

Study No.	Date	Author(s)	Title
IM-00063	**1976**	**Von Werhof, Jay, and Shrilee Von Werlhof**	**Archaeological Examination of a Proposed Geothermal Testing Site Near Heber, California**
IM-00066	**1976**	**Von Werhof, Jay, and Shrilee Von Werlhof**	**Archaeological Record Search of the Heber California Region**
IM-00072	1976	Von Werhof, Jay, and Shrilee Von Werlhof	Archaeological Examinations for the Wastewater Facilities Plan Report Sewer Rehabilitation, Calexico, California
IM-00075	1976	Von Werhof, Jay, and Shrilee Von Werlhof	Archaeological Examinations of Certain Geothermal Well Test-Site Areas in the Heber California District
IM-00115	**1977**	**Von Werhof, Jay, and Shrilee Von Werlhof**	**Archaeological Examination of the Heber Anomaly Report Prepared for VTN Consolidated, Inc.**
IM-00123	**1977**	**VTN Consolidated, Inc.**	**Draft Environmental Impact Report for the Heber Geothermal Demonstration Project**
IM-00125	1977	Pritchett, Howard E., and Lorraine Pritchett	Archaeological Examinations of a Proposed Site for ta Commercial Research Aguacultural Farm at Salton City, California
IM-00192	1979	VTN Consolidated, Inc.	Draft Master Environmental Impact Report for a 500-Megawatt Geothermal Development at Heber, Imperial County, California
IM-00199	1979	Walker, Carol, Charles Bull, and Jay Von Werlhof	Cultural Resource Study of a Proposed Electric Transmission Line from Jade to the Sand Hills, Imperial County, California
IM-00235	**1981**	**Walker, Carol, Charles Bull, and Jay Von Werlhof**	**Cultural Resource Study of a Proposed Electric Transmission Line from Jade to the Sand Hills, Imperial County, California**
IM-00272	1982	Sanchez, Miguel	Draft Environmental Impact Report – Current Land Use Plan, Heber Planning Unit
IM-00301	1983	Welch, Patrick	Cultural Resource Inventory for Thirty Proposed Asset Management Parcels in Imperial County, California
IM-00368	1987	Imperial County Planning Department	Chevron Geothermal Company of California Supplemental Project Information for the Auxiliary Production Facility Heber Geothermal Unit, Imperial County
IM-00441	1990	ENSR Consulting and Engineering	Environmental Assessment/Initial Study for the Placement of Fiber Optic Facilities Between Salton Microwave Station and Calexico, California
IM-00506	1994	Green, Eileen, and Joan Middleton	Cultural Resources Overview, All-American Canal Lining Project, Final Report
IM-00536	1979	Burkenroad, David	Phase One Regional Studies APS/SDG&E Interconnection Project Transmission System Environmental Study Cultural Resources: History
IM-00537	1979	Wirth Associates, Inc.	Phase One Regional Studies APS/SDG&E Interconnection Project Transmission System Environmental Study Cultural Resources: Archaeology
IM-00538	1979	Imperial County	Proposed Workscope Phase II Cultural Resources Studies APS-SDG&E Transmission Interconnect Project, Miguel to San Hills, Sand Hills to PVNGS
IM-00547	1982	Cultural Systems Research, Inc.	Draft Archaeological Research Design and Data Recovery Program for Cultural Resources within the Mountain Springs (Jade) to Sand Hills Portion of the APS/SDG&E Interconnection Project 500KV Transmission Line
IM-00595	1982	CSRI	Mountain Springs (Jade) to Sand Hills Data Recovery Preliminary Report
IM-00605	1996	Barrett Consulting Group	Preliminary Engineering Report for the Kloke Tract
IM-00647	1997	City of Calexico	Archaeological Assessment of the Kloke Tract
IM-00829	2001	Schaefer, Jerry, and Collin O'Neill	The All-American Canal: A Historic Properties Inventory and Evaluation

Table 4-1 Previous Cultural Studies within One Mile of the Project Area

Study No.	Date	Author(s)	Title
IM-00956	2005	Underwood, Jackson	Archaeological Reconnaissance of Los Lagos, Imperial County, California
IM-01080	1999	Von Werhof, Jay	Archaeological Examinations of the Heber Facilities Sewer and Water Improvement Project
IM-01095	2007	Garnsey, Michael	Cultural Resources Study for the Proposed Mosaic Project, Imperial County, California
IM-01101	2007	BRG Consulting, Inc.	Environmental Initial Study – Uniform Applications No. 2006-14, III Calexico Place
IM-01135	2006	HDR	Initial Study/Mitigated Negative Declaration – Towncenter Industrial Plaza, Calexico, California
IM-01214	2006	Hovey, Kevin	Historic Property Survey Report – The Widening of a 1,700-foot-long Portion of Cole Road Between Kloke Road to the West and the Southern Pacific Railway Right-of-way to the East in the County of Imperial, California
IM-01252	2007	HDR	Draft Environmental Impact Report – Los Lagos Specific Plan, Calexico, California
IM-01253	2008	BRG Consulting, Inc.	Draft Environmental Impact Report for the 111 Calexico Place Specific Plan
IM-01306	**1980**	**Wirth Associates, Inc.**	**APS/SDG&E Interconnection Project Environmental Study Phase II Corridor Studies – Native American Cultural Resources Appendices**
IM-01313	1980	Wirth Associates, Inc.	APS/SDG&E Interconnection Project Environmental Study Phase II Corridor Studies – Cultural Resources: Archaeology
IM-01727	2019	Roberts, Ted, and Lauren DeOliveira	Phase I Cultural Resources Report for the Heber 1 Expansion Project, Imperial County, California.

Bold indicates prior cultural resource studies that include the current Project area.

Table 4-2 Previously Documented Cultural Resources within One Mile of the Project Area

Primary No.	Trinomial	Age	Resource Type	Description
P-13-003312	CA-IMP-3312H	Historic	Unknown	Photo update of U.S. Military Telegraph Line mapped on 1880 US GLO Survey Map
P-13-003313	CA-IMP-3313H	Historic	Unknown	Photo update of U.S. Military Telegraph Line mapped on 1880 US GLO Survey Map
P-13-007699	CA-IMP-7594H	Historic	Structure	Southern Pacific Railroad Calexico Spur
P-13-008682	CA-IMP-8166H	Historic	Structure	Niland to Calexico Railroad
P-13-009077		Historic	Structure	Cole Road Pool
P-13-012743		Historic	Structure	Irrigation drop feature for the Strout Drain No. 2

The earliest map showing development within the Project area dates to 1915 (USGS 1915). At this time, the CM and Dogwood canals are present and a network of roads, including Dogwood Road, has been constructed south of the community of Heber; the Pacific Southern Railroad lies approximately 0.5 mile east of the Project area. The CM Canal is also shown on the adjacent 1907 *Holtville, CA* topographic map that depicts the area east of the Project (USGS 1907) By the early 1940s, two buildings have been constructed immediately south of the CM canal in the proposed Dogwood Parasitic Solar Energy Facility site (USGS 1940). An aerial photograph shows that the entirety of the Project area is under cultivation by 1953; Beech Drain has also been constructed by this time and one of the buildings noted on the 1940 topographic map appears to have been demolished (NETROnline 2023). By 1957, the second building on the proposed Dogwood Parasitic Solar Energy Facility site is in ruins and a new building has been constructed in its place (USGS 1957b). The HGEC facility has been constructed in the early 1980s and was completed in 1985 (Electric Power Research Institute 1987). No notable changes in the use of the Project area have occurred since the 1980s (NETROnline 2023).

4.3.2 Native American Outreach

PaleoWest contacted the NAHC for a review of the SLF on January 19, 2023. The objective of the SLF search was to determine if the NAHC had any knowledge of Native American cultural resources (e.g., traditional use or gathering area, place of religious or sacred activity, etc.) within the immediate vicinity of the Project area. The NAHC responded on February 28, 2023, stating that the SLF search resulted in positive results. The NAHC recommended that the Ewiiaapaayp Band of Kumeyaay Indians and the Torres-Martinez Desert Cahuilla Indians be contacted to request information on known Native American cultural resources in the Project vicinity. In addition, the NAHC provided a list of 24 individuals representing 16 Native American tribal groups that may also have knowledge of cultural resources in the Project area. Outreach letters that included a map of the Project area were sent to the Native American contacts on March 1, 2023 with follow up emails and phone calls conducted on March 15, 2023. A summary of the Native American outreach letters is provided in Appendix B.

As of March 23, 2023, four comments have been received. Ray Teran of the Viejas Band of Kumeyaay Indians ("Viejas") responded via email on March 1, 2023, requesting a Project plan and description, specifically as it relates to ground disturbance. PaleoWest responded later that day stating that information on the full extent of ground disturbance was not yet known but that it is anticipated that some ground disturbance will take place in most of the Project area that was shown on the map provided in the outreach letter. Mr. Teran responded via email on March 2, 2023, stating he had reviewed the proposed Project and at this time has determined that the Project site has cultural significance or ties to Viejas. He further noted that cultural resources have been located within or adjacent to the proposed Project and requested that a Kumeyaay Cultural Monitor be on site for ground-disturbing activities. In addition, he requested that the Viejas be informed of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains. On March 2, 2023, Jill McCormick, the Historic Preservation Officer of the Quechan Indian Tribe, responded via email and stated that the tribe does not wish to provide PaleoWest with any comment on the Project. Rebecca Osuna, Chairperson of the Inaja-Cosmit Band of Indians, stated on March 15, 2023 that the Project is outside of the tribe's geographic area and she had no comments at this time. Finally, Lisa Cumper, Tribal Historic Preservation Officer for the Jamul Indian Village, discussed the proposed Project on the phone with PaleoWest staff on March 15, 2023 and noted that the tribe would defer to more local Native American groups.

5.0 FIELD INVESTIGATION

5.1 FIELD METHODS

A cultural resources survey of the Project was completed by PaleoWest archaeologists between February 22 and 24, 2023. PaleoWest's Associate Archaeologist Heather Landazuri, M.A., RPA, served as the Field Director with assistance from Field Technicians Marlen Hinojosa and Amy Ross. The survey methods consisted of walking a series of parallel pedestrian transects spaced at 10–15 meter (33–50-feet) intervals across the geothermal plant site and parasitic solar energy facilities. A 300-feet- (91-meter-) wide buffer was also surveyed along the proposed transmission line and pipeline alignments. In total, 219 acres of land were inventoried during the field effort.

Survey transects were navigated using georeferenced maps on iPad tablets. Some portions of the buffer areas within the vicinity of the construction/aggregates company were fenced and inaccessible. These areas were inspected remotely from the edge of the property. Crew members also opportunistically examined any subsurface exposures, including rodent burrows and cut banks.

The survey area was documented with digital photographs that included general views of the topography, vegetation density, and other images. A photograph log was maintained to include photograph number, date, orientation, photograph description, and comments. The surveyors carefully inspected all areas likely to contain or exhibit sensitive cultural resources to ensure discovery and documentation of cultural resources located within the survey area. In particular, the survey crews carefully inspected rocky outcroppings, banks, clearings, and other habitable flat spots.

All cultural materials and features of an eligible age were recorded during the survey in accordance with OHP (1995) guidelines. Historic period archaeological indicators include the remnants of buildings, objects, and structures, or concentrations of materials at least 45 years in age, such as domestic refuse (e.g., glass bottles, ceramics, toys, buttons, and leather shoes), refuse from other pursuits such as agriculture (e.g., metal tanks, farm machinery parts, and horse shoes) or structural materials (e.g., nails, glass window panes, corrugated metal, wood posts or planks, metal pipes and fittings, and railroad spurs). Prehistoric site indicators include areas of darker soil with concentrations of ash, charcoal, animal bone (burned or unburned), shell, flaked stone, ground-stone, pottery, or even human bone. Historic built-environment resources included standing buildings or structures that were constructed at least 45 years ago.

5.2 FIELD RESULTS

Much of the survey area was located within and adjacent to agricultural fields (Figure 5-1 to 5-2). Exceptions to this include the proposed geothermal plant site and injection well site in the HGEC and the portion of the brine pipeline north of the CM Canal; both these latter areas have been previously developed and disturbed by energy generation operations (Figures 5-3 and 5-4). The topography across the Project area is relatively flat except for human made canals and drainage ditches. Soils were fine- to medium-grained silty clay loam that is light reddish-brown in color.

Figure 5-1. Overview of proposed parasitic solar photovoltaic facilities site, facing west

Figure 5-2. Overview of brine pipeline alignment south of the CM Canal, facing north

Figure 5-3. Overview of proposed geothermal plant site within the HGEC facility, facing southeast

Figure 5-4. Overview of portion of brine pipeline alignment west of the HGEC facility, facing south

Due to the extensive agricultural and geothermal development in the Project area, little natural vegetation was observed in the survey area. The entirety of the ground surface within the Project area exhibits some level of prior disturbance. The primary sources of this disturbance include development and maintenance of geothermal facilities, agricultural activities, construction of canals and drainage ditches, installation of transmission lines and roadways, and the deposition of modern refuse (Figure 5-5 and 5-6).

Ground visibility across the survey area was variable. The proposed Dogwood Geothermal Plant and well injection site in the HGEC, as well as the transmission line and brine pipeline alignments, displayed excellent visibility (80 – 90%) and were largely devoid of vegetation (Figures 5-2, to Figure 5-4). In contrast, ground visibility was only moderate (25 – 50%) in the areas proposed for the substation, parasitic solar energy facilities, and production well locations. At the time of the survey, these latter areas were under cultivation as alfalfa fields and vegetation obscured large portions of the ground surface (Figure 5-1).

The survey of the Project area resulted in the identification of three historic built-environment resources that include segments of the CM Canal, Dogwood Canal, and Beech Canal and Drain system (Figure 5-7). All three resources consist of portions of in-use irrigation-related features that are more than 45 years of age. No evidence was found for the buildings that had been identified on the historic topographic maps (see discussion in Section 4.3.1). Furthermore, no prehistoric or historic period archaeological remains were identified in the Project area. Descriptions and evaluations of the three historic built-environment resources are provided below; Department of Parks and Recreation (DPR) 523 forms are provided in Appendix C.

5.2.1 Central Main (CM) Canal

Portions of the proposed transmission line and brine pipeline alignment intersect the CM Canal. The CM Canal is one of the major distribution canals that channels water through the Imperial Valley. The linear feature branches off the All-American Canal northeast of Calexico. It runs in a roughly northwest direction for approximately 27 miles to drain into the New River. An approximately three-mile-long segment of the canal west of Highway 111 and east of South Clark Road was recorded as part of the current study. The CM Canal in this area ranges from approximately 80 to 100 feet in width and is contained within sloped earthen banks that are flanked by dirt and paved access roads (Figure 5-8). Fairly dense, low vegetation lines the areas of the banks nearest the water. At the time of the survey, the canal contained water from approximately four feet below ground level to an unknown depth; the bottom of the waterway was not visible. Although the exact date of construction is not known, historical maps indicate that it was operational in the early 1900s (USGS 1907).

Bridges have been constructed over the canal at Dogwood Road and Pitzer Road, with a Southern Pacific Railway wooden trestle bridge located east of Pitzer Road. The Dogwood Road Bridge (Br. No. 58C-0226) has recently been replaced and bears a 2023 date stamp (Figure 5-9). A series of brine pipelines have been installed over the canal approximately 1,500 feet west of the Dogwood Road Bridge.

CRHR Evaluation

The CM Canal is a major distribution canal and an integral part of the extensive irrigation system that comprises the IID. The construction and operation of the CM Canal and its associated laterals can be considered an important event in the early settlement of the Imperial Valley. The

Figure 5-5. Construction debris at the northeast corner of the Dogwood Parasitic Solar Energy Facility site, facing west

Figure 5-6. Modern refuse within proposed parasitic solar energy facility sites

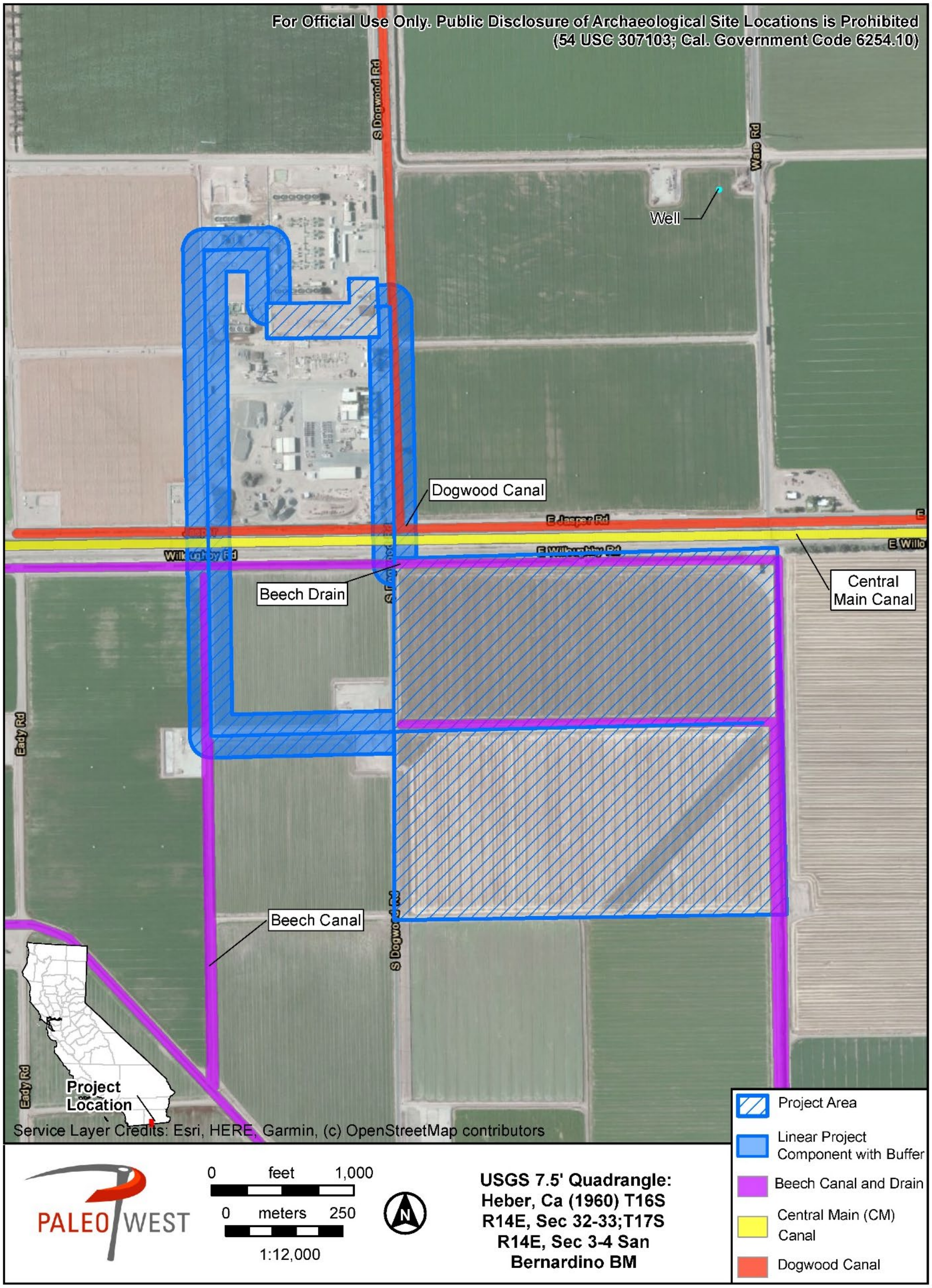

Figure 5-7. Resource location map

Figure 5-8. CM Canal from Dogwood Road Bridge, facing east

Figure 5-9. Dogwood Road Bridge (Br. No. 58C-0226), facing northwest

canal system that was built in the early twentieth century significantly increased the agricultural productivity of the area between the Alamo River and New River. Because the CM Canal can be directly associated with historical events that have made a significant contribution to the broad patterns of our history, it is recommended eligible under Criterion 1. The CM Canal was funded and constructed by the IID and cannot be attributed to a specific individual. Because it cannot be associated with the lives of persons important in our past, it does not meet CRHR Criterion 2. The CM Canal and its associated laterals and drains are simple in design and construction and utilitarian in nature, and their construction does not represent any innovative design or building technique. Therefore, the resource does not exhibit any distinctive characteristics or engineering merits that would suggest it is significant under Criterion 3. Finally, the CM Canal does not have the potential to yield any information important to the study of twentieth century channel construction and is thus not eligible under Criterion 4.

The alignment of the CM Canal has not changed significantly since its construction in the early part of the twentieth century and therefore, the resource retains integrity of location. There have been some minor alterations to the canal over the years, such as the replacement of bridges and the installation of brine pipelines. However, the earthen construction that characterizes the canal has not been substantially modified. Therefore, it retains integrity of design, workmanship, and materials. Although agricultural fields are still prevalent in the area, the construction and operation of industrial and energy facilities in the immediate vicinity of the CM Canal has resulted in the loss of integrity of setting, feeling, and association. Despite this loss, the character-defining aspects of the segment of the CM Canal within the Project area retain sufficient integrity to convey the resource's significance.

Based on these findings, PaleoWest recommends the CM Canal eligible for inclusion in the CRHR under Criterion 1.

5.2.2 Dogwood Canal

Portions of the proposed medium voltage cable and brine pipeline alignment intersect a lateral of the Dogwood Canal, an approximately 12.8-mile-long irrigation channel that branches off the CM Canal near Highway 111. The canal runs west paralleling the CM Canal for approximately 2.5 miles before turning north and continuing along Dogwood Road for 10.3 miles. Several smaller laterals diverge off the canal along its route, including one (Dogwood Lateral I) that originates near Dogwood Road and continues westward intersecting the brine pipeline alignment. An approximately 3.5-mile-long segment of the Dogwood Canal within the vicinity of the proposed Project area was documented as part of the current study (Figure 5-7).

The recorded canal segment consists of an open channel that has a top width ranging from approximately 20 to 60 feet (Figure 5-10). Although much of the structure is characterized by earthen banks, concrete lining has been placed within a section of the canal just west of Dogwood Road and along a 0.5-mile-long area east of Pitzer Road (Figure 5-10 to Figure 5-13). Based on contractor's date stamps, the concrete lining appears to have been installed well after the construction of the canal (Figure 5-12 and Figure 5-13). At the time of the survey, the Dogwood Canal contained water from approximately four feet below ground level to an unknown depth; the bottom of the waterway was not visible. The exact date of construction is not known. However, historical maps indicate that the canal was operational by 1915 (USGS 1915).

Figure 5-10. Portion of Dogwood Canal located west of Dogwood Road, facing south

Figure 5-11. Portion of Dogwood Canal by Dogwood Road showing recently installed concrete lining, facing south

Figure 5-12. Portion of Dogwood Canal gate feature and concrete lining with date stamp, east of Dogwood Road, facing south

Figure 5-13. Portion of Dogwood Canal east of Pitzer Road showing concrete lining and check/drop feature with 1957 date stamp, facing east

The Dogwood Canal has numerous check/drop structures along its course, each of which consists of gates with chute and cement walls that operate with a jack-type lifting mechanism resting on a wooden cross beam (Figure 5-12 and Figure 5-13). The checks/drop structures have curved cement headwalls on their upstream side and straight cement headwalls on their downstream side. The gates and hardware associated with these features are in good condition and are not original to the structures.

Along much of its alignment, the Dogwood Canal is flanked by dirt and paved roads. Several roads intersect the Dogwood Canal including Highway 111, Dogwood Road, and Pitzer Road. Underground pipelines have been installed to transport the water under each of these roadways. A Southern Pacific Railway bridge has also been constructed over the canal near Pitzer Road. Finally, a series of brine pipelines have been installed under the Dogwood Lateral I approximately 1,500 feet west of the Dogwood Road Bridge.

CRHR Evaluation

The Dogwood Canal is a part of the IID's CM canal system, which was initially constructed in the early twentieth century. The construction and operation of the Dogwood Canal and its associated laterals can be considered an important event in the early settlement of the Imperial Valley. The canal systems that were built at this time significantly increased the agricultural productivity of the area between the New River and Alamo River. Because the Dogwood Canal can be directly associated with historical events that have made a significant contribution to the broad patterns of our history, it is recommended eligible under Criterion 1. The Dogwood Canal was funded and constructed by the IID and cannot be attributed to a specific individual. Because it cannot be associated with the lives of persons important in our past, it does not meet CRHR Criterion 2. The Dogwood Canal and its associated laterals are simple in design and construction and utilitarian in nature, and their construction does not represent any innovative design or building technique. Therefore, the resource does not exhibit any distinctive characteristics or engineering merits that would suggest it is significant under Criterion 3. Finally, the Dogwood Canal does not have the potential to yield any information important to the study of twentieth century channel construction and is therefore not eligible under Criterion 4.

The alignment of the Dogwood Canal has not changed since its construction in the early part of the twentieth century and as such, the resource retains integrity of location. Although agricultural fields are still prevalent in the area, the construction and operation of industrial and energy facilities in the immediate vicinity of the canal has resulted in the loss of the resource's integrity of setting, feeling, and association. The resource has also experienced extensive alterations including lining portions of the canal with concrete and the replacement of gates and hardware. As a result of these alterations, the structure lacks integrity of design, workmanship, and materials. Due to the loss of integrity, the character-defining aspects of the Dogwood Canal do not retain sufficient integrity to convey its significance under Criterion 1.

Based on these findings, PaleoWest recommends the Dogwood Canal not eligible for inclusion in the CRHR.

5.2.3 Beech Canal and Drain

A portion of the proposed parasitic solar photovoltaic facilities site, transmission line, and brine pipeline alignment intersect the lateral distribution system associated with the Beech Canal and

Figure 5-14. Beech Canal lateral between agricultural fields in the proposed brine pipeline alignment, facing north

Drain. The Beech Canal is a 6.5-mile-long structure that originates off the CM Canal in Calexico and drains into the New River. Several smaller laterals diverge off the north and south sides of the canal along its length. The Beech Canal is an open, concrete-lined, trapezoidal-shaped structure that has a top width of approximately 12 to 16 feet and an unknown depth. The laterals are slightly smaller in size with a top width of 8 to 10 feet and a bottom width of approximately 2 feet; the depth of the laterals is approximately 4 feet (Figure 5-14). The lateral canals have been lined with concrete. Based on a contractor's date stamp, at least some of the structures were lined in 2012 (Figure 5-15). The laterals have numerous check/drop structures, which consist of single gates with chute and cement walls that operate with a jack-type lifting mechanism resting on a metal or wooden cross beam (Figure 5-14). The gates and hardware associated with these features are in good condition and are not original to the laterals. Historic topographic maps indicate that the Beech Canal and its laterals were built between 1907 and 1915 (USGS 1907,1915).

The Beech Canal irrigation system also includes a series of dirt-lined drainage ditches that remove excess water from the irrigated fields. The largest of these is the Beech Drain, which measures 20 to 26 feet in width with a depth of 6 to 8 feet (Figure 5-16). The Beech Drain runs along the southern edge of the CM Canal in a westward direction for approximately 1.5 miles to empty into the New River. The drainage system appears to postdate the construction of the Beech Canal and was likely built by the IID sometime in the late 1920s or 1930s (Dowd 1956:70-71).

Figure 5-15. Portion of Beech Canal lateral channel with 2012 concrete date stamp, facing west

Figure 5-16. Beech Drain north of the proposed parasitic solar photovoltaic facilities site, facing west

CRHR Evaluation

The Beech Canal and Drain are part of the IID's CM canal system, which was initially constructed in the early twentieth century. The construction and operation of the canal and its associated laterals and drainage systems can be considered an important event in the early settlement of the Imperial Valley. The canal systems that were built at this time significantly increased the agricultural productivity of the area between the New River and Alamo River.

Because the Beech Canal and Drain can be directly associated with historical events that have made a significant contribution to the broad patterns of our history, it is recommended eligible under Criterion 1. The Beech Canal and Drain was funded and constructed by the IID and cannot be attributed to a specific individual. Because it cannot be associated with the lives of persons important in our past, it does not meet CRHR Criterion 2. The Beech Canal and Drain and its associated laterals and drainage systems are simple in design and construction and utilitarian in nature, and their construction does not represent any innovative design or building technique. Therefore, the resource does not exhibit any distinctive characteristics or engineering merits that would suggest it is significant under Criterion 3. Finally, the Beech Canal and Drain does not have the potential to yield any information important to the study of twentieth century channel construction and is therefore not eligible under Criterion 4.

The alignment of the Beech Canal and Drain has not changed since its construction in the early part of the twentieth century and as such, the resource retains integrity of location. Although agricultural fields are still prevalent in the area, the construction and operation of industrial and energy facilities in the immediate vicinity of the Beech Canal and Drain has resulted in the loss of the resource's integrity of setting, feeling, and association. The resource has experienced extensive alterations including the lining of the canal and associated laterals with concrete and the replacement of gates and hardware. As a result of these alterations, the structure lacks integrity of design, workmanship, and materials. Due to the loss of integrity, the character-defining aspects of the Beech Canal and Drain do not retain sufficient integrity to convey its significance under Criterion 1.

Based on these findings, PaleoWest recommends the Beech Canal and Drain not eligible for inclusion in the CRHR.

6.0 IMPACTS ANALYSIS AND MANAGEMENT RECOMMENDATIONS

The cultural resources assessment for the proposed Project included background and archival research, a pedestrian survey, and resources documentation and evaluation. As a result of these efforts, three historic period irrigation canals (CM Canal, Dogwood Canal, and Beech Canal and Drain) were identified within the Project area. The CM Canal appears to meet the criteria for listing on the CRHR and as such, can be considered a historical resource for the purposes of CEQA. The two other resources, Dogwood Canal and Beech Canal and Drain, are both recommended not eligible for the CRHR due to a lack of integrity. Although no further cultural resource management is recommended for the Dogwood Canal or the Beech Canal and Drain, an impacts assessment is required for the CM Canal to determine if the proposed Project will result in a substantial adverse change in the significance of the historical resource.

6.1 IMPACTS ASSESSMENT

Based on the current design, the only Project components that intersect the CM Canal are the transmission line and brine pipeline corridors. It is anticipated that the transmission line running between the substation and the geothermal plants will span or be buried the CM Canal and not result in any physical alteration to the irrigation structure. Furthermore, the geothermal fluid/brine generated by the Project will be transported across the CM Canal through the existing pipeline network and no additional pipelines will be installed in the vicinity of the CM Canal. Based on this analysis, the proposed Project will not directly impact the essential physical characteristics of the historical resource and the aspects of integrity (i.e., location, design, workmanship, and materials) that contribute to its significance.

Indirect impacts are also not expected to result in an adverse change in the significance of the CM Canal. The recorded segment of the CM Canal has been impacted by prior development of industrial and solar facilities which have altered the surrounding vicinity and geographic terrain and caused a loss of integrity of setting, feeling, and association. Because the CM Canal has already lost these aspects of integrity, any indirect visual intrusions introduced by the Project will not result in a substantial change in the significance of the resource. It is anticipated other indirect impacts, such as noise and vibration effects, would be temporary in nature and limited to the construction phase.

Given these findings, the Project will not result in any adverse change to the significance of the CM Canal as a historical resource under CEQA.

6.2 MANAGEMENT RECOMMENDATIONS

The absence of known archaeological resources within one mile of the proposed Project suggests that this area is characterized by a low sensitivity for archaeological remains. However, there is a potential, albeit minimal, to encounter unanticipated cultural resources or human remains during ground-disturbing activities. PaleoWest recommends the following measures, based on state and agency regulations and guidelines, to mitigate any potential adverse impacts that could occur if there were an inadvertent discovery of buried cultural resources or human remains.

6.2.1 Unanticipated Discovery of Cultural Resources

If cultural resources are encountered during ground-disturbing activities, work in the immediate area must halt and an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for archaeology (National Park Service 1983) should be contacted immediately to evaluate the find. If the discovery proves to be significant under CEQA, additional work such as data recovery excavation and Native American consultation may be warranted to mitigate any significant impacts.

6.2.2 Human Remains

If human remains are found, regulations outlined in the State of California Health and Safety Code Section 7050.5 state no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. In the event of an unanticipated discovery of human remains, the County Coroner must be notified immediately. If the human remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission, which will determine and notify a most likely descendant (MLD). The MLD shall complete the inspection of the site within 48 hours of being granted access and provide recommendations as to the treatment of the remains to the landowner.

Should additional actions be proposed outside the currently defined Project area that have the potential for additional subsurface disturbance, further cultural resource management may be required.

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Appendix A.
Confidential Record Search Results

Appendix B.
Native American Coordination

Appendix C.
DPR 523 Forms