

**DRAFT**  
**CULTURAL RESOURCES INVENTORY REPORT FOR THE PROPOSED**  
**RECURRENT ENERGY**  
**CINCO SOLAR FACILITY PROJECT**  
**KERN COUNTY, CALIFORNIA**

***Prepared for and Submitted to:***

RE Barren Ridge 1, LLC  
300 California Street, 8th Floor  
San Francisco, California 94104

***Prepared by:***

Stephanie Jow, M.A., and Theodore G. Cooley, M.A., RPA

***With contributions by:***

Rebecca Apple, M.A., RPA  
Jamie Cleland, Ph.D., RPA  
Brian Spelts, B.A.

AECOM  
1420 Kettner Boulevard, Suite 500  
San Diego, California 92101  
(619) 233-1454

July 2014

Survey Area: 600 acres

USGS Quadrangles: Mojave NE, Mine 7.5"

Keywords: Archaeological Survey, Inventory Report, California City, Mojave Desert, US Fish and Wildlife Service, Kern County, Solar Facility, P-15-016275, CA-S-H-001, CS-S-H-002, CS-S-H-003, CS-S-H-004, CS-S-H-005, CS-S-H-006, CS-S-H-008, CS-S-H-020, CS-S-H-021, CS-S-H-022, CS-S-H-023, CS-S-H-024, CS-S-H-027, CS-S-H-028



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## EXECUTIVE SUMMARY

RE Barren Ridge Solar 1, LLC (Applicant), a subsidiary of Recurrent Energy, LLC (RE), proposes to construct and operate the RE Cinco Solar Facility Project (Project), an approximately 60 megawatt photovoltaic solar electric power-generation facility located in Fremont Valley in an unincorporated area of Kern County. A generation intertie line (gen-tie line) connecting the Project to the existing Los Angeles Department of Water and Power (LADWP) Barren Ridge Switching Station would also be constructed to deliver power to the electrical grid. Together, the planned solar facility and the proposed gen-tie line are known as the RE Cinco Project (formerly the RE Barren Ridge Solar Project).

The United States Fish and Wildlife Service (USFWS) will serve as the federal lead for this Project, responsible for compliance with the National Environmental Policy Act (NEPA) requirements for the solar facility site. Kern County is the lead agency under the California Environmental Quality Act. The Applicant's preferred gen-tie line alignment would be constructed primarily on federally owned land administered by the Bureau of Land Management (BLM) and will require issuance of a BLM right-of-way (ROW) grant. BLM is analyzing effects associated with issuance of an ROW grant per NEPA, and will consult with USFWS pursuant to Section 7(a)(2) of the Endangered Species Act. USFWS will issue a Section 7(a)(2) biological opinion for the ROW grant for the gen-tie line and a Section 10(a)(B) incidental take permit for the solar facility.

This report presents the inventory and preliminary assessment of the cultural resources documented within the solar facility site for the purpose of identifying any historic properties that may be affected by the proposed Project. To meet applicable regulatory requirements, AECOM completed an intensive pedestrian archaeological survey and a built environment resources assessment.

Prior to field investigations, on December 16, 2013, a comprehensive records search for the Project was performed by staff at the California Historical Resources Information System's Southern San Joaquin Valley Information Center (SSJVIC), housed at California State University, Bakersfield. In addition, LADWP provided AECOM with a Class I/Class II summary report not on-file with the information center. Based on the SSJVIC records and literature search and LADWP files, 13 previous investigations had been conducted within the records search area, which encompasses the Project area and a 1-mile buffer around the solar facility site. These consist of 10 survey-level investigations, one site evaluation, one cultural resources records search and site visit summary report, and one Class I/Class II investigation. Of these investigations, only four overlap with portions of the Project area, and one covers the entire direct effects APE (Hudlow 2011).

The records and literature search results found seven previously recorded cultural resources within a 1-mile radius of the Project area. Of these, only three resources are located within the boundaries of the solar facility site: one historic refuse scatter (P-15-016275) and two prehistoric isolates (P-15-016273 and P-15-016274). The other four identified resources, three historic and one prehistoric, are located within the 1-mile records search buffer zone. The historic resources

are the Los Angeles Aqueduct (CA-KER-3549H), the Southern Pacific Railroad (CA-KER-3366H), and a refuse scatter with a prehistoric flake isolate (P-15-007706). The prehistoric resource consists of several buried hearth features (CA-KER-3939).

The Native American Heritage Commission and local Native American tribal representatives were contacted to solicit information on resources in the vicinity and comments on the Project. In addition, representatives from the San Manuel Band of Mission Indians and the Kern Valley Indians participated in the cultural resources survey at the request of USFWS. A summary of the results of the ongoing contact program is presented in Chapter 3, and a detailed contact communication log and copies of correspondence are provided in Appendix C.

To meet federal requirements, Project cultural resources specialists, accompanied by Native American participants, conducted a cultural resources survey of the Project area. The Project area of potential effects (APE) consists of approximately 2,440 total acres, 600 of which were assessed for direct effects to archaeological resources; all 2,440 acres were assessed for indirect effects to built environment resources. As currently designed, the Project would occupy approximately 500 of the 600-acre direct effects APE when constructed.

An intensive pedestrian survey of the direct effects APE identified 15 archaeological sites and 33 isolates. Of these 48 total resources, 47 were newly identified and one was previously recorded. The two previously recorded isolates (P-15-016273, -016274) were not relocated during survey efforts. All 15 archaeological sites observed are historic in age and consist of 11 refuse scatters (P-15-016275, CS-S-H-001, -002, -003, -004, -005, -006, -008, -021, -022, -024), one historic refuse scatter with a prehistoric isolate (CS-S-H-020), a single prospect pit (CS-S-H-023), and two historic roads (CS-S-H-027 and CS-S-H-028). Of the 33 newly identified isolates, 28 are historic, and five are prehistoric. No historic architectural resources were identified in either the direct effects or indirect effects APE.

Archaeological sites and isolated finds identified during the present survey effort consist of prehistoric and historical artifacts and features. The majority of the cultural resources identified in the Project are historic in age, and consist predominately of metal cans, with smaller quantities of glass bottles and jars, broken ceramics, and sundry metal items. Historical features include a possible prospect pit, two historic roads, and debris scatters from the early to mid-20th century. Prehistoric cultural materials include mostly flaked stone debitage, with smaller amounts of flaked stone tools.

Preliminary assessments of the archaeological sites based on surface materials and conditions indicate that none of the sites located within the Project meet the eligibility criteria for inclusion in the National Register of Historic Places (NRHP). Therefore, no historic properties will be affected by the Project. Table ES-1 summarizes the identified archaeological resources and their recommended NRHP status.

**Table ES-1. Summary of Archaeological Resources in the Project**

	<b>Total</b>	<b>Recommended Eligible</b>	<b>Recommended Not Eligible for NRHP</b>	<b>Unevaluated for NRHP</b>
<b>Prehistoric Sites</b>	0	0	0	0
<b>Historic Sites</b>	15	0	15	0
<b>Isolated Finds</b>	33	0	33	0



# CHAPTER 1

## INTRODUCTION

### PROJECT DESCRIPTION

RE Barren Ridge Solar 1, LLC (Applicant), a subsidiary of Recurrent Energy, LLC (RE), proposes to construct and operate the RE Cinco Solar Facility Project (Project), an approximately 60 megawatt (MW) photovoltaic solar electric power generation facility located on approximately 500 acres of private land in Fremont Valley, an unincorporated area of Kern County (Figure 1). A generation intertie line (gen-tie line) connecting the Project to the existing Los Angeles Department of Water and Power (LADWP) Barren Ridge Switching Station would also be constructed to deliver power to the electrical grid. Together, the planned solar facility and the proposed gen-tie line are known as the RE Cinco Project (formerly the RE Barren Ridge Solar Project) (Figure 2).

The United States Fish and Wildlife Service (USFWS) will serve as the federal lead for this Project, responsible for compliance with the National Environmental Policy Act (NEPA) requirements for the solar facility site. Kern County is the lead agency under the California Environmental Quality Act. The Applicant's preferred gen-tie line alignment would be constructed primarily on federally owned land administered by the Bureau of Land Management (BLM) and will require issuance of a BLM right-of-way (ROW) grant. BLM is analyzing effects associated with issuance of an ROW grant per the National Environmental Policy Act (NEPA), and will consult with USFWS pursuant to Section 7(a)(2) of the Endangered Species Act (ESA). USFWS will issue a Section 7(a)(2) biological opinion for the ROW grant for the gen-tie line and the issuance of a Section 10(a)(B) incidental take permit (ITP) for the solar facility.

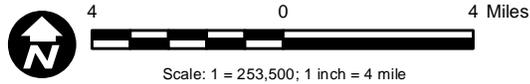
### REGULATORY SETTING

The proposed Project requires authorization and issuance of an ITP by USFWS. Federal laws, ordinances, regulations, and standards that guide the management of cultural resources are summarized in Table 1.

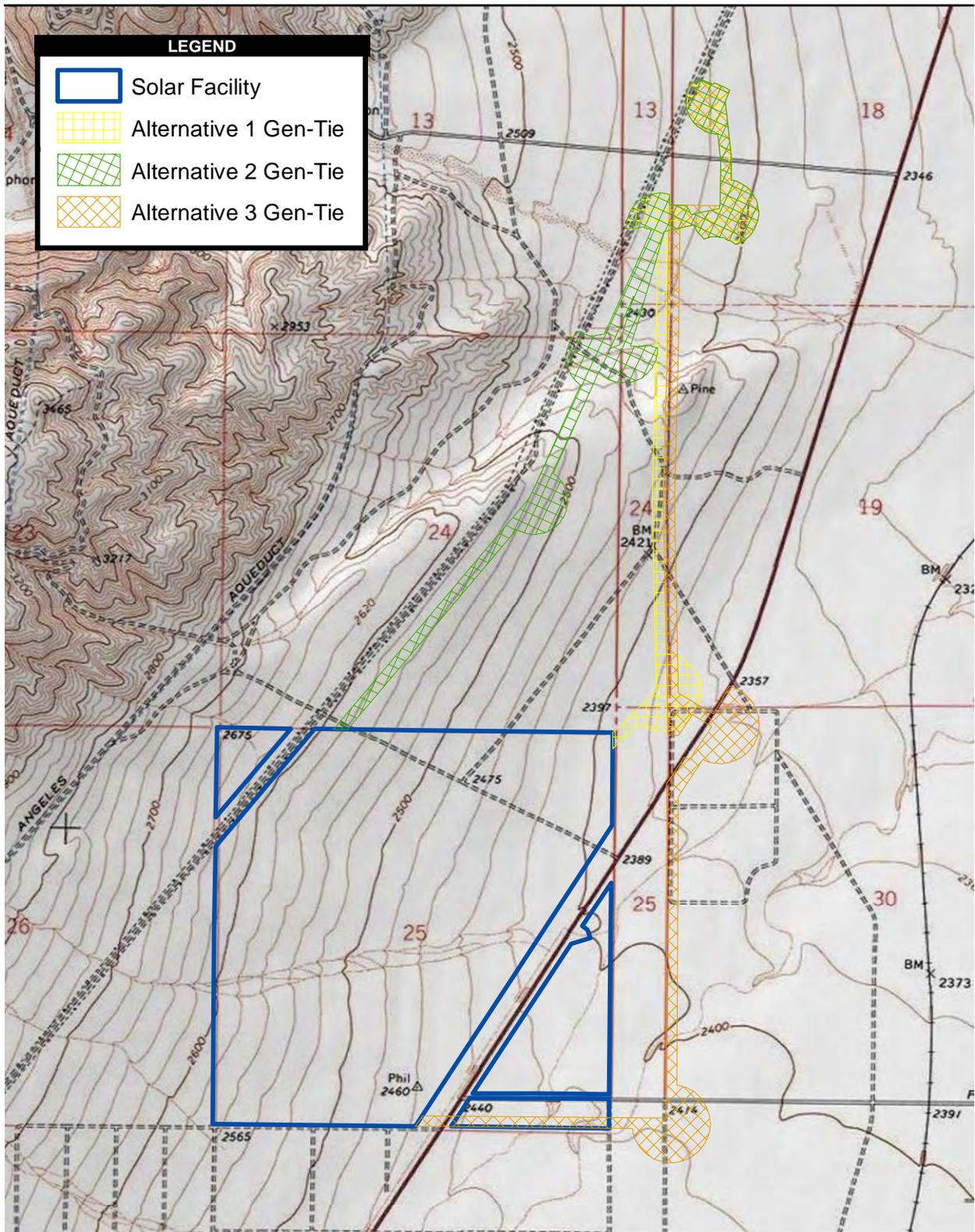
Cultural resources investigations for the Project involve assessing identified resources for eligibility to the National Register of Historic Places (NRHP). Cultural resources are defined as districts, buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, and/or scientific importance. Historic properties are defined as any buildings, sites, structures, or objects that may have historical, architectural, archaeological, cultural, and/or scientific importance that are eligible for listing in the NRHP.



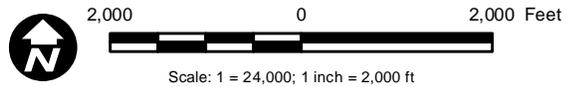
Source: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013



**Figure 1**  
**Regional Setting of Project Area**



Source: AECOM 2014; Copyright:© 2013 National Geographic Society, i-cubed; 7.5' Topographic Quadrangle Mojave NE 1994



**Figure 2**  
**RE Cinco Project Overview**

To qualify as a historic property, a resource must be significant at the local, state, or national level under one or more of the following four criteria:

- A. are associated with events that have made a significant contribution to the broad patterns of our history;
- B. are associated with the lives of persons significant in our past;
- C. embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; and/or
- D. have yielded or may be likely to yield, information important in prehistory or history.

In addition, resources must retain integrity to qualify for the NRHP. As defined by the ACHP, integrity is the ability of a property to convey its significance through physical features and context, including location, design, setting, materials, workmanship, feeling, and association (ACHP 2009:2).

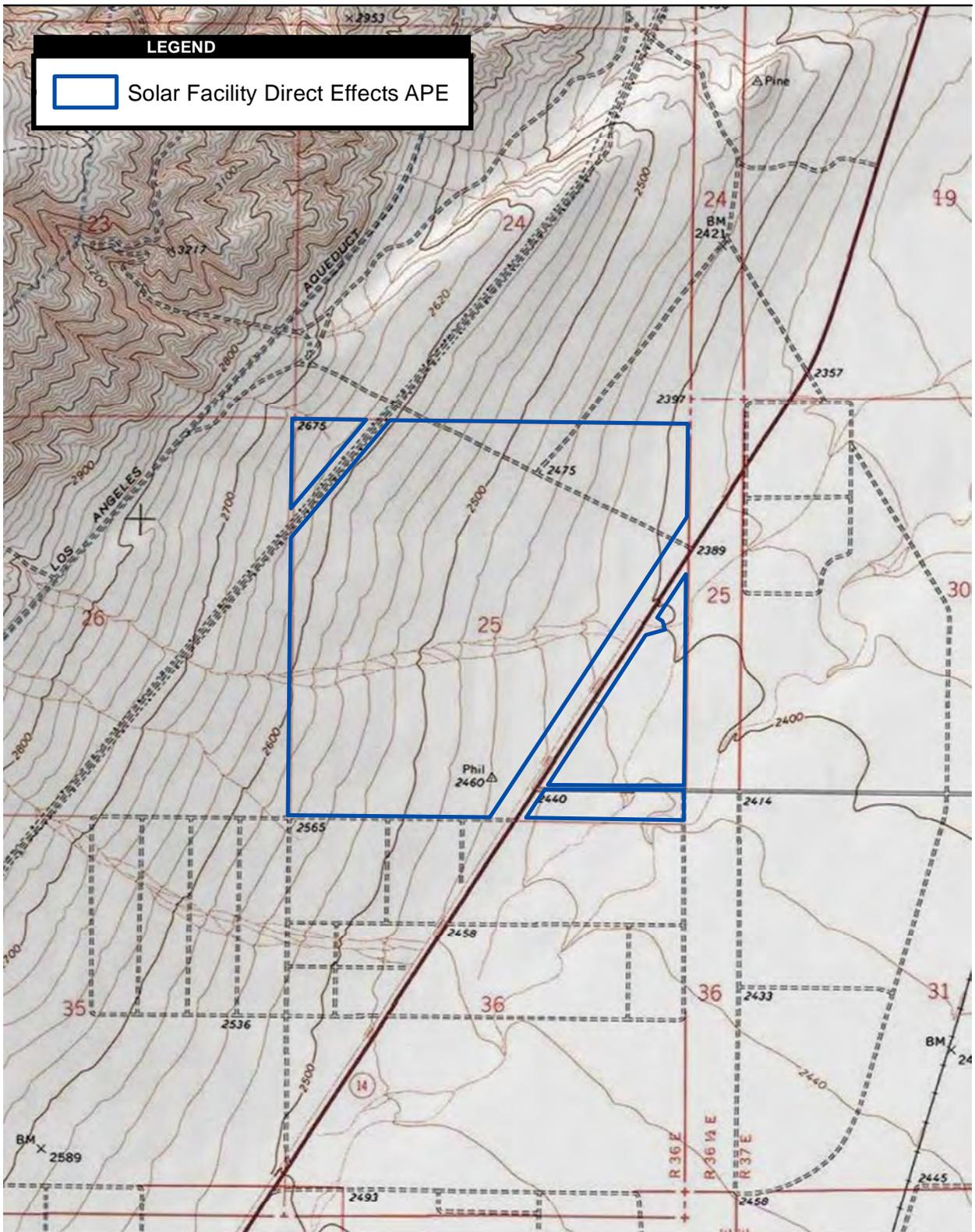
#### **AREA OF POTENTIAL EFFECTS (APE)**

Pursuant to 36 CFR 800.4(a)(1), an area of potential effects (APE) is the geographic area within which an undertaking may directly or indirectly alter the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking, and may be different for different kinds of effects caused by the undertaking. Typically, the APE for archaeological resources is defined by the proposed ground disturbance area(s), or areas of potential direct effects. For historical resources, including existing standing structures, the APE is often defined more broadly to include areas of potential indirect visual, auditory, or atmospheric effects.

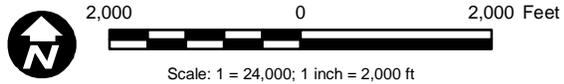
As proposed, the Project would be constructed on approximately 500 acres of land on T31S, R36E, Section 24 of the Mojave NE United States Geological Society (USGS) 7.5-minute quadrangle. However, the direct effects APE for the proposed Project encompasses approximately 600 acres and includes the majority of Section 24 of the quadrangle (Figure 3). Six-hundred acres of land on Section 24 were included in this analysis to retain the possibility for future use and design changes without undergoing a separate environmental review process.

The indirect effects APE consists of approximately 2,440 acres, encompassing 0.5 mile in each direction from the solar facility site boundary (Figure 4).

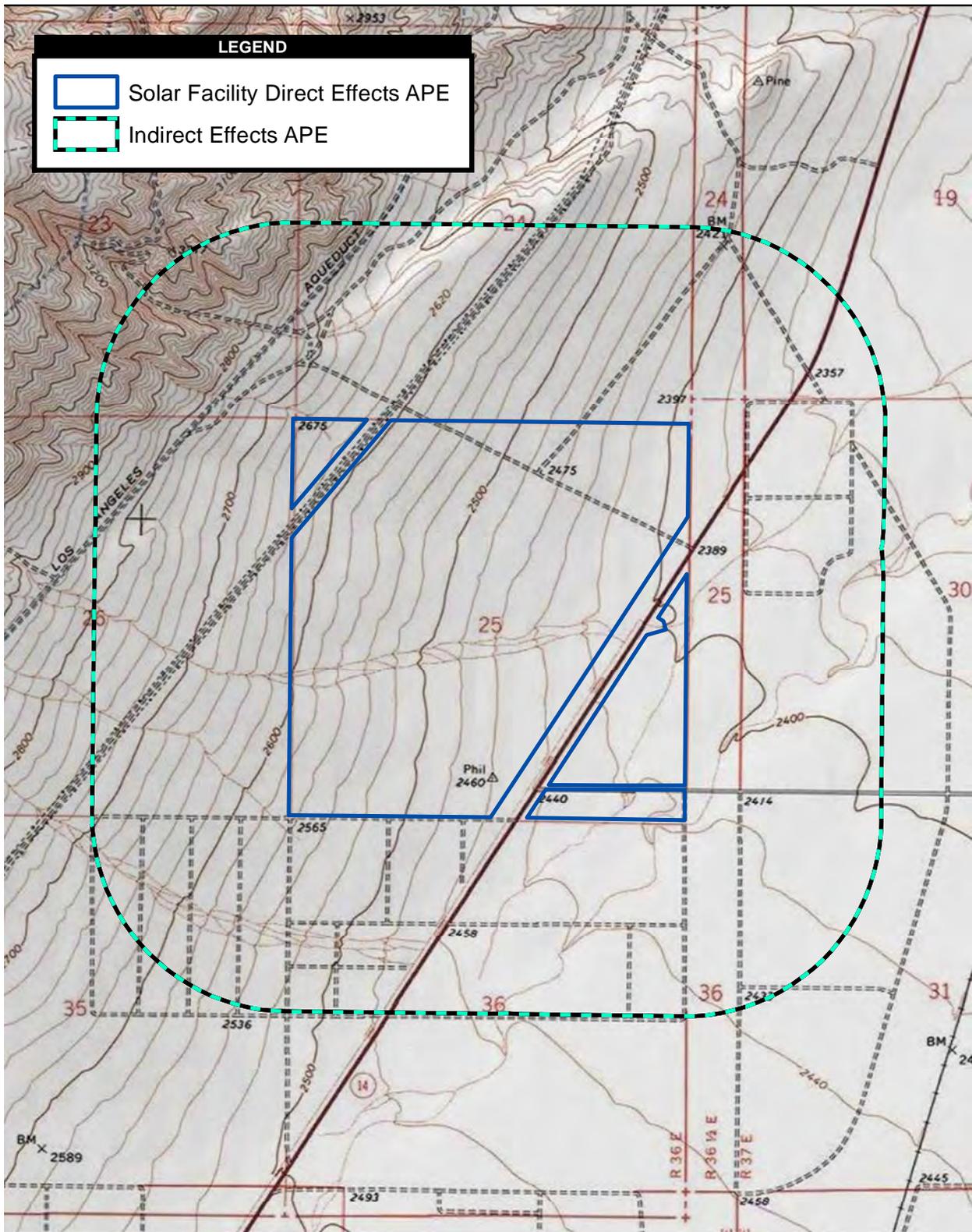
The combined direct and indirect effects APEs, therefore, total approximately 2,440 total acres, 600 of which were assessed for direct impacts to cultural resources and all 2,440 acres of which were assessed for indirect effects to built environment resources.



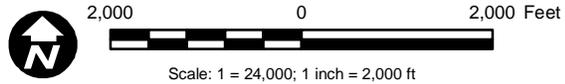
Source: AECOM 2014; Copyright:© 2013 National Geographic Society, i-cubed; 7.5' Topographic Quadrangle Mojave NE 1994



**Figure 3**  
**Direct Effects APE**



Source: AECOM 2014; Copyright:© 2013 National Geographic Society, i-cubed; 7.5' Topographic Quadrangle Mojave NE 1994



**Figure 4**  
**Indirect Effects APE**

## **PROJECT PERSONNEL**

Stephanie Jow, M.A., served as the Project cultural lead and report co-author. Theodore Cooley, M.A., RPA, was Project field director and co-author of this report. Stacey Jordan-Connor, Ph.D., RPA, provided Project oversight and senior-level review of this report. Stacie Wilson, Spencer Beitz, and Brian Spelts provided technical geographic information system (GIS) support and created all Project maps.

## **REPORT ORGANIZATION**

Chapter 1 of this report provides a description of the proposed Project, including the regulatory setting and a definition of the Project APE. Chapter 2 is a discussion of the physical and cultural setting of the Project. The physical setting section includes a brief discussion of Project climate, hydrology, geology, flora, and fauna. The cultural setting section includes a discussion of the prehistoric and historic contexts relevant to the immediate Project area and surrounding Mojave Desert.

Chapter 3 reviews the archival research and contact program initiated by Project cultural resources personnel. Archival research included a complete records search of the files held at the California Historical Resources Information System's Southern San Joaquin Valley Information Center (SSJVIC) at the University of California, Bakersfield, and consultation of historic aerial photographs and maps.

Chapter 4 presents Project methodology, including descriptions of field methods, reporting methods, defined site types, and research issues and themes. Chapter 5 provides the results of the field survey and background research program, including a discussion of Project archaeological sites and isolates by theme, context, and type, and also provides summary tables that show significance recommendations and impact assessments for Project sites. Chapter 6 provides a summary and management recommendations for cultural resources within the Project area.

Appendix A includes resumes of key personnel. Appendix B includes the results of the records search undertaken at the SSJVIC. Appendix C includes documentation of the Native American Contact Program. Appendix D includes Project maps containing the specific locations of archaeological sites and isolated finds. Appendix E contains the California Department of Parks and Recreation (DPR) site forms for archaeological sites identified during the intensive pedestrian survey.

Once this report is finalized, a copy will be sent to the SSJVIC as a permanent record.



## **CHAPTER 2 PROJECT SETTING**

### **NATURAL CONTEXT**

#### **Physiography and Geology**

Fremont Valley is situated in the westernmost area of the Mojave Desert at the base of the Sierra Nevada Mountains. It is bounded by the Rosamond Hills and Antelope Valley to the south, the southern Sierra Nevada and the Tehachapi Mountains to the south and west, the El Paso Mountains to the north, and the Rand Mountains to the northeast (Sutton 1991). Fremont Valley itself is associated with the Garlock fault system and is deeply filled with alluvium that originates in the El Paso and Rand Mountains to the north and the Sierra Nevada Mountains to the west (Sutton 1991). Cajon loamy sand and Rosamond clay are the most widespread soils in Antelope Valley. These soil types are most prevalent in areas that have been impacted by agriculture (Sutton 1991).

The oldest identified rock formations in the western Mojave Desert consist of metamorphosed sedimentary rocks, including gneiss, marble, quartzite, mica schist, gabbro, and conglomerates of pre-Cambrian age. Rock types of the Paleozoic era (230 to 620 million years ago [mya]) include scattered sedimentary and carbonate rock, chert, limestone, sandstone gypsum, and dolomite. Materials of this nature typically formed at the bottom of an ocean and yield fossils ranging from Cambrian to Permian in age. These rock materials are not abundant in the western Mojave, but substantial sections of Paleozoic rock do occur within the El Paso Mountains (Hewett 1954). To the west, the Sierra Nevada Mountains consist principally of Mesozoic-age granitic rocks, but also contain lesser amounts of metamorphic rocks (Harden 2004).

In the El Paso Mountains and Barstow area, north and east of the Project area, deposits of sandstone and limestone dating to the Mesozoic era (70 to 230 mya) occur. During the Oligocene and Miocene epochs (23 to 5 mya), volcanism dominated the landscape, with volcanic activity occurring near Ridgecrest and Red Rock Canyon (Monastero 1996). Basalt and rhyolite flows also formed north of Indian Wells Valley and into the Coso Mountains approximately 3 mya (Monastero 1996). During the late Middle Pliocene, the Mojave region was subjected to great erosion (Hewett 1954), and this continued into the Pleistocene. The erosion occurring during this glacial period (beginning approximately 1.64 mya) formed the long southward-trending Owens, Searles, Panamint, and Death Valleys (Hewett 1954). During the Pleistocene, glacial melt-water likely flowed south across the Mojave block, filling Owens Lake, China Lake, Searles Lake, and Death Valley. During the Mid and Late Pleistocene, in the Fremont Valley and the Antelope Valley to the south, lakes likely also associated with the Late Pleistocene glacial melt were formed, including Koehn Lake in the Fremont Valley, and Rosamond and Rogers lakes in Antelope Valley. During the subsequent Holocene and continuing to the present day, erosion from the Sierra Nevada and surrounding mountains has actively filled in all of these valleys with sediments (Monastero 1996; Sutton 1988, 1991).

## Climate and Hydrology

The Mojave is a warm-temperature desert situated between the subtropical Sonoran Desert to the south and the cold-temperature Great Basin to the north. The Mojave Desert is characterized by extreme variations in daily temperatures and more arid conditions than other American desert regions. Freezing temperatures occur during the winter, particularly in higher elevations. Summers tend to be hot, dry, and windy. Precipitation in the region is highly variable from one year to the next (ranging from 3 to 5 inches per year). Almost all precipitation arrives in the winter, but the region also experiences rare, intense summer thunderstorms. It is during these rare flood events that some of the most dramatic changes take place on the desert landscape.

Fremont Valley is within the rain shadow of the Sierra Nevada. The climate is semi-arid with low humidity. Temperatures have an extremely wide range, with diurnal summer temperatures from 120 degrees Fahrenheit (°F) to diurnal winter temperatures of 0°F (Sutton 1991). Rainfall is similar to that of Antelope Valley, averaging approximately 3 inches per year on the valley floor (Stones 1964).

There are several main hydrologic features in the western Mojave Desert. The most notable drainage systems occur on Edwards Air Force Base and in Antelope Valley and Fremont Valley (Sutton 1991). The system on Edwards Air Force Base consists of two sizeable dry lake beds, Rosamond and Rogers, and one minor dry lake bed, Buckthorn. Antelope Valley, situated southwest of Fremont Valley, is a closed basin, with all runoff water flowing to the lake bed complex (Sutton 1991). Six major drainages feed into this complex: Amargosa Creek, Big Rock Creek, Little Rock Creek, the wash complex from Edwards Air Force Base, the wash complex from the Tehachapi foothills, and the drainage originating near the town of Mojave. These drainages are capable of carrying substantial quantities of water.

Fremont Valley is a closed basin that contains one playa, Koehn Lake (Sutton 1991). Three major drainages flow into the lake: from the west, Cottonwood and Cache Creeks, and from the east, a wash entering the lake, draining the eastern Rand and El Paso Mountains (Sutton 1991). Although the importance of these drainages to prehistoric population groups is uncertain, known prehistoric habitation sites in the area are located near fairly large drainages or next to the shoreline of Koehn Lake (Sutton 1991). This seems to indicate that water availability would have had a significant influence in determining the location of prehistoric habitation sites.

## Flora and Fauna

The Mojave Desert has a typical mountain-and-basin topography with sparse vegetation. Although a large portion of the Project area is marked by creosote bush (*Larrea tridentate*), which is the dominant plant species of the Mojave Desert (Warren 1984), extant vegetative resources are characterized by moderate species diversity. Lower elevations are dominated by creosote bush, and higher elevations contain yuccas and agaves, and then pinion-juniper habitats (Warren 1984). Plant communities within proximity of springs, marshes, and streambeds produce tules, cattails, and various grass species (Warren 1984). Currently, the majority of the Project area is deflated and abandoned agricultural fields with little vegetation.

Large fauna species are rare in the Mojave Desert. Rodents, reptiles, and birds are more common and are found along the desert floor. Rodent species include various pocket mice (*Perognathus* spp.), whitetail antelope squirrel (*Ammospermophilus leucurus*), and kangaroo rat (*Dipodomys* spp.). Reptile species present include desert tortoise (*Xerobates agassizii*), desert iguana (*Dipsosaurus dorsalis*), common king snake (*Lampropeltis getulus*), and Mojave rattlesnake (*Crotalus scutulatus*). More than 300 species of birds are found in the Mojave Desert. A few species more common to the open desert are prairie falcon (*Falco mexicanus*), burrowing owl (*Athene cunicularia*), roadrunner (*Geococcyx californianus*), and horned lark (*Eremophila alpestris*). Other species found in the Mojave Desert are blacktail jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), and coyote (*Canis latrans*).

## **Geomorphology and Subsurface Deposits**

This inventory of the Project area identified cultural material on the surface ranging from prehistoric lithic reduction sites to modern refuse.

As described below, the predominant landforms in the Project area consist mainly of large and small alluvial fan surfaces and wash channels. The following section is largely based on a geoarchaeological report for an area immediately adjacent to the north of the Project area (Young 2009).

## **Geomorphological Setting**

### ***Physical Setting***

The Project area is located within Fremont Valley in the southwestern portion of the Mojave Desert geomorphic province. The western edge of the valley is bordered by the southwest-to-northeast-trending section of the southern Sierra Nevada Mountains, between the El Paso Mountains to the north and the Rand Mountains to the south. Also extending along this western edge of the valley is the Garlock Fault zone. To the north of the Project, in the northern end of Fremont Valley, is the basin sump of Koehn Lake. Frequently occurring minor drainages on individual small fans join to form axial washes that extend east from the complexly faulted hillslopes along the base of the Sierra Nevada Mountains toward the valley bottom. Along the base of the mountains, numerous coalesced fan systems (i.e., bajadas) extend into the valley and across the Project area. Larger drainages, such as one emanating from Pine Tree Canyon just north of the Project area, have formed expansive fans over time that overlap and join the range-front bajada. These larger drainages have contributed large amounts of run-off and sediment to the axial washes and to the valley basin (Young 2009:1). The surface deposits in Pine Tree Canyon are composed of recent sediments, most of which have been deposited in the last 1,000 years (Young 2009:1). Also of interest for the Project is a small drainage or wash that flows out of the Garlock Fault zone and into the larger Pine Tree Wash. During the pedestrian survey, this small wash was seen to contain significant quantities of natural angular cobbles of chert and jasper.

The Project is situated atop the gently sloping bajada along the base of Sierra Nevada Mountains. In general, the ground surface atop the bajada consists of medium to coarse sandy soils with varying quantities of angular cobbles; small to medium-sized granitic boulders are also present.

The number of cobbles increases within the stream beds of some of the larger of the small axial washes.

### ***Holocene Climate Change***

Climatic shifts over the course of the Holocene (Table 2) resulted in a number of biotic and hydrologic changes that affected the distribution of resources important to human groups living in and using the Western Mojave Desert.

**Table 1. Major Climatic Intervals**

<b>Climatic Interval</b>	<b>Years Before Present (B.P.)</b>	<b>Climate and Hydrology</b>
Late Pleistocene/Early Holocene	11,300 –7000	Cooler summer temperatures; upslope retreat of woodland species; precipitation greater than present
Middle Holocene	7000–5500	Warmer temperatures; arrival of modern Creosote dominate vegetation; precipitation generally lower than present
Neoglacial	5500–2000	Cooler temperatures; precipitation greater than present
Medieval Climatic Anomaly	1150–550	Warmer temperatures; two extreme droughts between 1060 and 850 B.P., and 740 and 600 B.P.
Little Ice Age	450–150	Cooler temperatures; precipitation greater than present

The climatic history of the Western Mojave region has had a significant effect on the geomorphology of the Project area, beginning with a relatively abrupt environmental change occurring during the end of Pleistocene and the beginning of the Holocene (i.e., after approximately 11,300 years ago). This change was marked by a retreat of the Sierran glaciers, a significant decline in rainfall moisture, and a rise in temperature, and it represents a transition from the temperate and seasonal conditions of the Late Pleistocene to the arid desert environment that became dominate during the early Middle Holocene (Young 2009:1). During this period, alluvial fans in the area were possibly very active in this increasingly dry regime as vegetation density declined and floods had an increasingly erosive effect. Deposition would occur across broad portions of a fan, with especially large floods resulting in massive deposits in distal fan locations. These warmer and arid conditions continued in the area into the Middle Holocene or until approximately 5,500 years ago when moisture levels began, again, to approach Early Holocene levels. This change to cooler and wetter climate conditions during the early Late Holocene is characterized by a return of glacial climate conditions in portions of the adjacent Sierra Nevadas and consequent increases, once again, in run-off into the Fremont Valley below. As during the Early Holocene, alluvial fans generally began to stabilize, with water more consistently reaching the distal fan in washes resulting in seasonal (i.e., periodic) deposition and distal fan aggradation (Young 2009:1). Beginning sometime before 2,000 years ago, the area, again, began to dry, with generally arid conditions identified as a Late Holocene interval (Wigand and Rhode 2002). This interval, while remaining generally dry, contained several climatic (i.e., precipitation, evaporation, and/or temperature) reversals or fluctuations (Stine 1994; Young 2009:1-2).

Included among these was climatic fluctuations during the Late Holocene was a phenomena termed the Medieval Climatic Anomaly, which extended from approximately 1,200 to 700 years ago, and was marked by generally warm temperatures punctuated by extreme, extended droughts from A.D. 890 to 1100, and from A.D. 1210 to 1350 (Stine 1994). In the Mojave Desert, packrat middens provide evidence of effectively drier conditions associated with increased temperatures. Although there are no published records of increased spring activity or desert lake high stands in the Mojave Desert during this period (Jones et al. 1999), in the Colorado Desert to the south, Waters (1983) reported evidence for high stands of Lake Cahuilla during much of this interval.

The generally arid conditions of the Medieval Climatic Anomaly reversed sharply approximately 600 years ago, marking the beginning of the Little Ice Age (Grove 1988). A variety of data from the Mojave Desert indicate both lower temperatures and increased winter precipitation during this period. Cooler temperatures are suggested by the expansion of cold-loving blackbrush scrub into lower elevations at this time. Evidence for extended lakestands in the Mojave Sink (Enzel et al. 1989, 1992) indicates enhanced precipitation in the Transverse Ranges. Essentially modern climatic conditions only became established in the region approximately 150 years ago.

Young (2009:1) notes that climatic changes had a significant effect on the vegetation communities that were present in the Project area during the Holocene:

Elevational and latitudinal shifts in the regional woodland community, along with the arrival of creosote bush (*Larrea tridentata*), marked the transition from temperate and seasonal conditions of the Late Pleistocene to arid desert that dominates the Holocene. Because individual species responded differently to climate variation, changes in plant communities did not necessarily occur in direct association with global climatic events. Creosote bush spread slowly northward across the Mojave in the early Holocene, and did not arrive as far north as Fremont Valley until about 7,000 years ago (Koehler et al. 2005). This cloning species became the dominate vegetation in the lower and middle elevations of the Mojave, and contained an understory of Mojave sage (*Salvia mohavensis*), shadscale (*Atriplex confertifolia*), desert rue (*Thamnosma montana*), and wolfberry (*Lycium cooperi*). By 4,500 years ago, this vegetation had coalesced to become the valley-bottom community (Koehler et al. 2005; Spaulding 1990).

## **Geological Units**

The geology of the Project area was mapped by Smith (1964) at a scale of 1:250,000. No larger-scale maps (e.g., 1:24,000) were available for this study. A review of this published map indicates that the proposed Project area is mostly underlain by Quaternary-period (2.6 million years ago [Ma] to present) alluvial and fluvial deposits, including deposits dating to the Holocene epoch (less than 10,000 years before present [B.P.]) and Pleistocene epoch (2.6 Ma to 10,000 years B.P.) (Table 3). In addition, the small aforementioned finger-ridge present in the northern part of the gen-tie corridor contains granitic bedrock dating from the Cretaceous period (145.5 to 99.6 Ma) to Jurassic period (201.6 to 145.5 Ma). These units and their potential for

intact and significant cultural resources are described and discussed below. Only the Quaternary Late Pleistocene and Holocene age units are discussed in detail in the following sections, because the older units are not culturally sensitive at the subsurface.

**Table 2. Summary of Geologic Units in the Gen-Tie Corridor**

<b>Age</b>	<b>Geologic Unit</b>	<b>Map Abbreviation</b>	<b>Unit Description</b>
Holocene and Pleistocene	Recent alluvial fan and alluvial valley deposits	Qal	Unconsolidated valley and stream/wash deposits; locally dissected fans; coarse fanglomerate
Pleistocene	Non-marine sedimentary deposits	Qc	Unconsolidated stream terrace deposits of sand, clay, and gravel

Data Source: Smith 1964

***Quaternary Recent Alluvium (Qal)***

Quaternary alluvium consists of unconsolidated valley and stream sediments, locally dissected fans, and coarse fanglomerate along the eastern base of the Sierra Nevada Mountains (Smith 1964). Within the Project corridor, modern wash sediments, dated as Recent in age, consist of unconsolidated, angular to subangular gravelly sands derived from the higher Sierra Nevada elevations. These sediments are coarser grained along the base of the mountains and become more fine-grained, grading toward distal alluvial sand and gravel. These sediments, which date from the mid to late Pleistocene through the Holocene, contain the potential for buried cultural deposits. The various types of these sediments are present in the gen-tie corridor everywhere except where the corridor crosses the Cantil-Fault-created finger ridge.

***Quaternary Terrace Deposits (Qc)***

Quaternary terrace deposits consist of unconsolidated stream terrace deposits of sand, clay, and gravel (Smith 1964). These deposits are likely a mixture of colluvial and alluvial sediments dating to the early Pleistocene. They are elevated and exposed along the base of the Sierra Nevada foothills, but may extend beneath the more recently deposited fan deposits. These deposits are present in the gen-tie corridor only where the corridor crosses the Cantil-Fault-created finger ridge.

**Project Geomorphology and the Potential for Buried Deposits**

Holocene sedimentary formations deposited in the Fremont Valley during the Holocene have the potential to contain site deposits and/or features created by human occupation and that were subsequently buried during episodes of flooding and/or aeolian deposition. This potential is demonstrated by the results of several subsurface geoarchaeological (Young 2009) and archaeological field investigations (Apple et al. 2008; Cooley 2011; Gardner et al. 2006) previously conducted in areas immediately adjacent to the current Project. One of these studies occurred in an area adjacent to the north of the gen-tie corridor. This study consisted of geoarchaeological trenching, all within the wash and alluvial fan area, at the mouth of Pine Tree

Canyon. In the study, a number of buried paleosols were identified that indicated periods of stability on the fan. These strata could represent possible past living surfaces for human populations. These and other results in the study indicated the presence of Holocene strata with the potential to contain buried prehistoric cultural deposits or features (Young 2009). Radiocarbon dating of various levels within these sedimentary strata indicated time frames during which prehistoric human habitation/activity could have occurred (Table 4). As can be seen in Table 4, strata from various depths produced eight radiocarbon dates ranging from circa 150 to 15,260 B.P., with the intervening dates being well distributed between these dates. One of the Holocene strata contained a prehistoric hearth feature at a depth of 0.80 meters, on which a calibrated radiocarbon date of  $1620 \pm 60$  was obtained (Young 2009:12). During archaeological studies, other buried prehistoric hearth features located in the same area and in similar stratigraphic context dated to almost a millennium later (Apple et al. 2008; Cooley 2011). Adjacent to the Project area to the south, buried prehistoric hearth features were encountered along the Garlock Fault zone at depths from 1.35 meters to 4.5 meters below the surface (Gardner et al. 2006). These features dated from 6390 to 7980 calibrated years B.P. (2006:49). Because of the proximity of these subsurface occurrences, the geomorphological circumstances are closely related to those present in the Project area. Consequently, it is possible that such subsurface archeological resources could also be present in the Project area.

**Table 3. Radiocarbon Results from Area Adjacent to Gen-Tie Corridor**

Trench Location	Stratum	Depth	Material	Lab No.	Convention	13C/12C	Calibrated Years B.P.
TL3	3	2.2 mbs	Organic Sediment	Beta-255187	9550 ± 50 BP	-21.3 o/oo	10910 ± 140
TL4a	1	0.2 mbs	Wood	Beta-255913	10 ± 40 BP	-24.6 o/oo	150 ± 90
TL4b	5	2.4 mbs	Organic Sediment	Beta-255910	2920 ± 40 BP	-22.4 o/oo	3080 ± 70
TL5b	2	0.8 mbs	Charred Material	Beta-255909	1690 ± 40 BP	-22.6 o/oo	1620 ± 60
TL5a	6	1.8 mbs	Charred Material	Beta-255911	3500 ± 40 BP	-22.0 o/oo	3780 ± 50
TL5a	8	2.8 mbs	Charred Material	Beta-255186	4250 ± 40 BP	-24.2 o/oo	4800 ± 60
TL5a	12	4.1 mbs	Organic Sediment	Beta-255912	7330 ± 50 BP	-21.0 o/oo	8130 ± 70
Pine Tree Wash	2	1.5 mbs	Organic Sediment	Beta-254726	12730 ± 70 BP	-22.1 o/oo	15260 ± 120

Notes: Radiocarbon data were collected from detailed trench profiles and may be correlated to other trenches in each study locality. Radiocarbon calibration using CalPal (Weninger and Jöris 2004).

mbs = meters below surface

Source: Young 2009:8

## CULTURAL CONTEXT

### Prehistory

Prehistoric human settlement patterns in the Mojave Desert have been influenced by environmental change. Major climatic periods influenced prehistoric spatial settlement patterns and resource exploitation. Archaeological investigations have indicated that although the area had limited prehistoric resources and surface water, the region supported a long and occasionally dense human population (Moseley and Smith 1962). Archaeological remains tend to be widely scattered and sparse and are usually located along the margins of pluvial lakes (Warren 1990; Willig 1988). Although research in the Mojave has produced a wide array of cultural sequences, for the purpose of this report, a broad terminology is used to provide temporal context to the region. The sequence consists of the Paleoindian period, Pinto period, Gypsum period, Rose Spring period, and Protohistoric period.

#### ***Paleoindian Period (12,000 to 7000 B.P.)***

This period is the earliest documented evidence of human occupation in the Mojave Desert, and has been referred to as the Western Pluvial Lakes Tradition (WPLT) (Sutton 1991). The WPLT encompasses a broad geographic region from the western Great Basin to Southern California and north to Oregon. Evidence suggests that Paleoindian-period population groups were highly mobile, with settlement patterns that reflect a dependency on lacustrine resources (Sutton 1991; Sutton et al. 2007; Warren 1990). This cultural adaptation to pluvial conditions (e.g., lakes,

marshes, and grasslands) flourished for several millennia circa 10,500 B.P., but then disappeared during the warmer and more arid conditions of the Middle Holocene (Moratto 1984).

The Lake Mojave complex is one of the most recognized lithic complexes of the WPLT. These assemblages are typically characterized by foliated points and knives, Lake Mojave points, Silver Lake points, and flaked stone crescents. Materials dating to the Paleoindian period in the western Mojave Desert are few and confined to the dry lake beds in Antelope Valley. To date, none have been identified in Fremont Valley (Sutton 1991).

#### ***Pinto Period (7000 to 4000 B.P.)***

A period of dramatic environmental change has been posited for the Pinto period. The environment changed from pluvial to arid conditions; rivers and lakes dried up and animal and plant life changed. This period is seen by Warren (1984) as marking the beginnings of cultural adaptations to the desert. Desert inhabitants either adapted to this change or relocated to areas with more favorable environmental conditions. This depopulation of the area seems evident in the small size of Pinto-period sites, which are often limited to surface deposits. These ephemeral sites suggest temporary or seasonal occupations by small groups of people (Moratto 1984), focusing on a forager-like strategy (Sutton et al. 2007).

The most important distinction of Pinto-period assemblages relates to an increase in the abundance of groundstone implements (Sutton et al. 2007). The appearance of significant numbers of milling stones in Pinto assemblages is attributed to the exploitation of hard seeds, which is seen by Warren (1984) as part of the process of subsistence diversification brought on by increased aridity and decreasing game populations. No confirmed Pinto-period sites are known in Fremont Valley, although a few Pinto-style projectile points have been identified in the Tehachapi area and other parts of the western Mojave (Sutton 1988).

#### ***Gypsum Period (4000 to 1500 B.P.)***

The Gypsum period is marked by an increase in the number of archaeological components and increased diversity in assemblage and site setting (York 1995). Occupations in the Antelope Valley during this period are indicative of large, permanent or seasonally occupied villages with smaller, seasonally based special-purpose sites, including rock rings, lithic scatters, and milling stations (Sutton 1980; Warren 1986). The appearance of large village and special-purpose sites in the Antelope Valley has been attributed by Warren (1986) to refined hunting methods and seed processing technologies that raised the regional carrying capacity and facilitated population growth.

Gypsum-period assemblage sites are characterized by diagnostic projectile points, leaf-shaped points, rectangular-based knives, flake scrapers, T-shaped drills, large scraper-planes, choppers, and hammerstones. There is an increase in the presence of milling stones, and the mortar and pestle were introduced during this period.

#### ***Rose Spring Period (ca. 1500 to 1000 B.P.)***

Archaeological evidence for the Rose Spring period indicates a major population increase, changes in artifact assemblages, and well-developed middens (Sutton 1988). The introduction of small projectile points into assemblages in the Mojave Desert and the Great Basin appear to

mark the introduction of the bow and arrow and the decline of the atlatl and spear weaponry (Sutton 1996).

Subsistence strategies seem to shift toward the exploitation of small to medium-sized game, including lagomorphs and rodents. The milling of plant foods was an important activity, with numerous bedrock milling features at Rose Spring, including mortars and slicks (Sutton 1988).

### ***Protohistoric Period (1000 B.P. to European contact)***

There is an increase in the ethnic and linguistic complexity within the Mojave Desert during this period. Desert Side-notched points and Brownware ceramics become more widely distributed throughout the Mojave Desert and the Great Basin. This development, combined with linguistic evidence, is associated with the Numic-speaking Paiute and Shoshone expansion throughout most of the area (Bettinger and Baumhoff 1982).

Characteristic artifacts of this period include Desert series projectile points (Desert Side-notched and Cottonwood Triangular), Brownware ceramics, Lower Colorado Buff Ware, unshaped hand stones and milling stones, incised stones, mortars, pestles, and shell beads (Warren and Crabtree 1986).

### ***Archaeological Patterns***

Prehistoric sites dating to the Late Holocene era in the Western Mojave Desert are more frequently represented during the Late Prehistoric than any other time period. This period is marked by significant changes in the archaeological record, including shifts in subsistence practices and settlement patterns. The bow and arrow is introduced during this time, and is evidenced by Cottonwood and Desert Side-notched type points. Burial practices change from the former practice of inhumation to cremation. Flaked stone tools during this era are more perfunctory—being quickly fashioned and discarded after casual use—a radical shift from the former tradition of crafting more formalized and finely finished bifacial tools. A population increase is also seen during the Late Prehistoric, although there are indications in some areas that the increase was possibly interrupted due to a dramatic climatic change between, roughly, 1,200 and 650 years ago, known as the Medieval Climatic Anomaly (Sutton 1988, 1996; Whitley et al. 1988). The effect of this event on human populations, however, is still a subject of some debate (Byrd et al. 1994; Gardner 2009:208; Sutton 1993:155–156, 1996:238–239). There is also an increase in the ethnic and linguistic complexity within the Mojave Desert during this time, with distinct language groups (Numic [Paiute] and Takic) possibly moving into new areas (Sutton et al. 2007:243–244). Possibly associated with these population movements are a wider distribution of Cottonwood Triangular and Desert Side-notched points and Brownware ceramics in the Mojave Desert and the Great Basin during this period. A number of Late Prehistoric period sites, or site components, have been documented in the southern portion of the western Mojave in the Fremont and Antelope Valleys and vicinity (Byrd et al. 1994; Everson et al. 1993; Gardner 2009; Sutton 1984, 1988, 1991; Sutton and Everson 1992).

### **Ethnographic Background**

The Kawaiisu occupied the southern Sierra Nevada south of the Kern River and into the northern Tehachapi Mountains. They also claimed a major portion of the western Mojave Desert,

including Fremont Valley, during the ethnographic period (Garfinkel and Williams 2011; Sutton 1991). Neighboring groups included the Tubatalubal to the north, the Southern Yokuts to the west, and the Kitanemuk and Serrano groups to the south. The notion of distinct cultural boundaries was foreign to the Kawaiisu, and the overlapping of groups was customary (Zigmond 1986). Interaction and intertribal relations were peaceful and cooperative, with combined annual hunting expeditions for game drives commonplace (Voegelin 1938).

The Kawaiisu language belongs to the Southern Numic branch of Northern Uto-Aztecan (Sutton 1991). The linguistic data suggest that the Kawaiisu occupied the general area of the southern Sierra Nevada/western Mojave Desert for some time (Sutton 1991). Kawaiisu subsistence practices focused on hunting and gathering of local plant and animal resources (Zigmond 1986). The principal food source was acorns, which were supplemented with meat from large and small game, rodents, birds, and insects (Zigmond 1986). Acorns were further used to trade for exotic obsidian and salt. Although no agriculture was practiced, there is evidence of the pruning of tobacco plants and the burning of wild seed fields to improve plant yields for the following year (Zigmond 1986). The Kawaiisu exploited many other plants, and Zigmond (1986) identified more than 250 taxa that were used.

The Kawaiisu exploited resources outside of their core area in the southern Sierra Nevada, with seasonal trips into the western Mojave Desert (Zigmond 1986). Koehn Lake in Fremont Valley was identified as one destination of these seasonal trips (Zigmond 1986).

Social organization was rooted in the family group, with several male leaders being accepted at any given time (Zigmond 1986). Although families did, at times, live near each other and cooperate in some activities (Zigmond 1986), no apparent larger formal political grouping was apparent (Sutton 1991).

The material culture of the Kawaiisu was varied and complex (Sutton 1991). Material cultures included the wood bow and arrow and elaborate basketry (Zigmond 1986). Zigmond (1986) believes that pottery evident at some sites was obtained through trade with neighboring Great Basin groups rather than manufactured by the Kawaiisu.

## **History**

European exploration of the Colorado Desert began in the 16th century, but sustained Euro-American settlement of the region did not occur until the mid-19th century. This extended period of exploration without expansion creates a long Proto-historic period in the region, during which Europeans and local Native American groups knew of one another but interacted very little. This time period is discussed above from the point of view of Native American history. Below, the Euro-American expansion into the region and subsequent historical developments are described.

### ***Early Exploration***

The European period in the Mojave Desert began when Spanish missionaries and explorers entered the area in the 18th century. Among the first Europeans in the area was Pedro Fages, who led an expedition into the western Mojave in 1772 in pursuit of Spanish soldiers who had deserted (Pourade 1960). Later forays into the Mojave were undertaken in 1776 by Franciscan

missionary Francisco Garcés. Garcés was tasked with exploring overland routes between Santa Fe, New Mexico, and Southern California. During his expedition, he stayed in what is today the town of Mojave (Coues 1900; Sutton 1991). The establishment of trade routes between Santa Fe and Los Angeles and the establishment of missions in the Mojave Desert were difficult in the 18th century because the native Mohave people hindered Spanish expansion beyond the coastal areas of California (Bean and Bourgeault 1989). The Old Spanish Trail, which passes through the Mojave Desert, was not firmly established as a travel route until the 1830s (Norris and Carrico 1978).

American exploration into the Mojave Desert began in the 19th century. Jedediah Smith was the first American to enter the Mojave in 1826 and 1827. Little is known about Smith's time in the Mojave since his notes were lost in a fire (Pourade 1961). Smith followed the Old Spanish Trail, which runs south and east of the current Project area, and ultimately reached the Pacific Ocean where Spanish authorities prevented him from continuing farther and temporarily imprisoned him (Beck and Haase 1974; Norris and Carrico 1978). In 1844, John C. Fremont traveled through the Mojave from the north and eventually met up with the Old Spanish Trail (Beck and Haase 1974; Fremont 1845). Fremont was named "The Great Pathfinder" because his explorations helped open the West for Americans to move into California in the middle and late 19th century (Barnard 1977).

By the 1850s, the Old Spanish Trail was established as a reliable overland route to California, and it became easier for people to move into the area. Once California was ceded to the United States, the land was open for settlement and development. With the discovery of gold in the Sierra Nevada Mountains, California's population boomed. Mining led to the creation of roads throughout the state. Later, these mining roads would be used to establish railroads that operated in the region.

Fremont Valley was a prominent thoroughfare for travelers coming to California and as a trade route. State Historic Landmark 476 ("Desert Spring") located near Cantil commemorates the historic trails and early uses for the area:

This spring was on an old Indian horse thief trail and later (1834) Joe Walker Trail. The famished Manly-Jayhawk Death Valley parties (1849–50) were revived here after coming from Indian Wells through Last Chance Canyon. This was also a station on the Nadeau Borax Freight Road. (California Resource Agency 1996)

The majority of early mining in California took place in the north, near Sacramento and San Francisco. In the Mojave, scientific exploration was being undertaken in conjunction with investigations into proposed railroads from the east (Sherer 1994). An expedition led by Lt. Amiel Weeks Whipple in 1854 sought to survey a railroad route leading from Arkansas to Los Angeles along the 35th parallel, passing near Fremont Valley. The proposed railroad was meant to tie into lines that originated in both the north and the south (Barnard 1977). Whipple's expedition included scientists who recorded information about the geology, climatology, and biology of the region (Sherer 1994). A later expedition undertaken by Edward Beale in 1857 tested the feasibility of using camels for transport across the desert, and established an early wagon road through the area (Norris and Carrico 1978; Sherer 1994).

## *Mining*

American exploration into the Mojave Desert allowed settlers to begin to move to the region. The earliest Americans to move into the Mojave were typically suppliers for miners headed north in the 1850s. A few prospectors established mines in the Mojave region as well, but it was not until the 1860s that mining expanded in the area (Norris and Carrico 1978). As mining increased, so did the number of permanent settlements. From the 1860s to the 1880s, mining became the primary economy in the area. Mining camps grew into mining towns that were connected through a series of stage coach roads. The Owens River Road, which runs through Fremont Valley, was one such road. Another road at Nadeau Springs was located west of the town of Mojave. This stop was originally a wagon stop along the road between Los Angeles and the mines located at Inyo. Later, the Southern Pacific Railroad established a stop north of Mojave called Nadeau Station (Warren and Roske 1981).

Major mining districts were established in the Rand and El Paso Mountains, east of Fremont Valley (see Hall and Barker 1975). Other large mines included Cerro Gordo in the Owens Valley north of the Project area and Darwin northeast of the Project area, where silver was discovered (Norris and Carrico 1978). Various materials were mined in the western Mojave Desert, including gold, silver, and iron (Coombs et al. 1979).

An important commercial mining endeavor that took place in the Mojave Desert involved the extraction of borax. Although the activity could never be described as a dominant activity in the area, it is celebrated because of its association with the 20-mule teams that carried the raw material from Death Valley into other parts of the western Mojave (Norris and Carrico 1978). The 20-mule teams crossed Fremont Valley on their way to the town of Mojave (Wynn 1963). Borax mining operations were undertaken by several companies during the late 19th century. Among these were the Eagle Borax Works (founded by Francis C. “Borax” Smith), the Harmony Borax Works, Amargosa Borax, and Pacific Coast Borax Company (Coombs et al. 1979; Norris and Carrico 1978).

Mining operations continued well into the 20th century. Mining took place near Oro Grande (near San Bernardino), Calico (near Barstow), Copper City (near China Lake), and Dale District (near Twentynine Palms). In Fremont Valley, major mining operations took place at Goler Gulch (northwest of the Project area) and Red Rock Canyon (east of the Project area). However, the majority of mining operations at the end of the 19th century and into the early 20th century were at the Yellow Aster lode, where the Rand Camp and later town of Randsburg were established (Norris and Carrico 1978).

Another result of mining involved the use of roads through the Mojave Desert. Wagon and stage coach roads were established between the mines, camps, mining towns, and Los Angeles (Beck and Haase 1974; Coombs et al. 1979). Bullion Road ran through the current Project area and connected the Inyo mines with the roads that led to Los Angeles (Di Pol 2007).

Into the 20th century, mining operations became more corporate, but a few prospecting claims still proved fruitful on a small scale. Resources shifted away from precious metal mining and focused more on nonprecious metals, borax, and salt (Norris and Carrico 1978).

### ***Railroad***

Railroads developed in the Mojave Desert in response to the mining boom and the desire to move goods between the eastern states and California. Routes had been scoped by earlier expeditions, but the railroad did not arrive in the valley until 1876. This rail line ran from Tehachapi to Mojave and then to Los Angeles via the Antelope Valley as part of the Southern Pacific Railroad (Norris and Carrico 1978). Mojave was incorporated as a town in 1886, the same year the railroad moved through, and many of the stops on the line corresponded with previous stops on the wagon and stage coach roads (Wynn 1963).

The Southern Pacific Railroad established stops in Fremont Valley, including one in the town of Cinco and another at Cantil, north of the Project area. A major engineering feature associated with the Southern Pacific Railroad is the Tehachapi Loop. This is a section of track, roughly 20 miles west of the Project area, where the rail line passes over itself. This allowed trains to get through the Tehachapi Pass and into Mojave and ultimately Los Angeles.

The Southern Pacific Railroad had a significant impact on the region, as it allowed more people to move into the area for mining, business, and agricultural pursuits. The railroad continues to be used today, running from the town of Mojave southeast of the Project area, east of State Route 14 and along the western edge of California City, and through the western portion of the Project area.

### ***Agriculture***

Early homesteaders moved into the western Mojave Desert at the same time mining became the major economic pursuit in the area. The establishment of the railroad enabled homesteaders to move into the area, particularly near Lucerne Valley and Apple Valley (Coombs et al. 1979).

Water sources were always an issue affecting the rate at which agriculture could grow in the arid environment of the high desert. Farmers had to stay near rivers for dependable sources of water. Some farmers, however, found moderate success by using wells and pumps to irrigate or by building near dry lake beds that periodically flooded during the rainy winter season. The need for water in association with farming made growth difficult, but several communities were able to survive on a subsistence farming lifestyle (Norris and Carrico 1978). One dry farming area in Fremont Valley was located at Muroc next to Rogers Dry Lake. This area is situated to the south of the Project area and is currently the site of Edwards Air Force Base.

Evidence of farming is visible in the Project area as well. Much of Fremont Valley was used for alfalfa farming in the 20th century (Di Pol 2007; Swope 1988). However, the lack of reliable water resources ensured that agriculture did not become a dominant industry in the region. Water resources did become a significant part of the history of the western Mojave Desert and Fremont Valley with the construction of the Los Angeles Aqueduct in the early part of the 20th century.

### ***Los Angeles Aqueduct***

The construction of the Los Angeles Aqueduct stands as one of the greatest architectural and engineering achievements in Southern California. The aqueduct runs past the western edge of the Project area, and remains an important water source for Los Angeles and the surrounding areas. The demand for water in the growing community of Los Angeles required a solution beyond the

locally available water resources in the city. The aqueduct runs 226 miles from the Owens Valley to Los Angeles. The aqueduct was considered a major engineering feat for its day, and its importance to regional history cannot be overstated.

The Owens Valley had been visited by Fred Eaton in 1904. He realized that the water in the valley could be diverted to Los Angeles, and began planning with William Mulholland about how best to divert water from the Owens Valley to Los Angeles. Eaton speculated that the course of the aqueduct could follow the natural flow of an ancient river that ran to the mountains north of Los Angeles. The river had been blocked by a lava flow that formed the Owens Basin (LADWP n.d.).

Construction on the aqueduct began in 1908 and was completed in 1913. The result was a gravity flow aqueduct that was able to provide a reliable source of water for Los Angeles. To obtain the land and water rights, the City of Los Angeles had to purchase tracts of land along the proposed route, leaving many in Owens Valley with the impression that Los Angeles was stealing their water (LADWP n.d.). Over the 5 years the aqueduct took to complete, thousands of workers moved through Fremont Valley. The railroad was used to move goods and equipment from Mojave to the Lone Pine area, and pumping stations and construction camps popped up along the aqueduct alignment (Norris and Carrico 1978).

Aqueduct construction camps and rail line spurs in Fremont Valley include those at Cinco and Cantil. The camp at Cinco was used as a supply depot to support aqueduct construction. The section of track near Cinco, called the “Jawbone Division,” was constructed by the Southern Pacific Railroad in 1909 to carry supplies needed to run the camp and build the aqueduct (Di Pol 2007).

At the Cantil construction camp, a railroad spur was built to send supplies and building materials 8 miles up Red Rock Canyon to the Dove Springs area. This rail line was built in 1909 and was in operation for 22 months and then dismantled (Di Pol 2007).

The completion of the aqueduct stands as one of the major contributing factors to the expansion of Los Angeles in the early 20th century. In the years following construction of the aqueduct, Los Angeles grew at unprecedented rates. Expansion of the First Los Angeles Aqueduct began in 1940, and extended the system 105 miles north to Mono Basin, culminating in the Second Los Angeles Aqueduct in 1970 (LADWP n.d.).

### ***The Military***

The military had a significant role in the development of the Mojave Desert in the 20th century. Prior to World War II, the western Mojave was one of the major training grounds in preparation for war. The Mojave Army Antiaircraft Range (later renamed Camp Irwin) was built near Barstow, and Condor Field, a glider training base, was established near Twentynine Palms (Coombs et al. 1979; Norris and Carrico 1978).

South of the Project area, Muroc Bombing and Gunnery Range (later renamed Edwards Air Force Base) was established. Edwards Air Force Base is an important spots in aviation history, as many

experimental aircraft were designed and tested on the base, and it was one of the landing sites for the Space Shuttle. Edwards Air Force Base continues to operate today.

### ***California City***

Perhaps the most important development in relation to the area around the Project is California City itself. California City was incorporated in 1965. Nat Mendelsohn purchased what would become California City in 1958, with plans of creating a metropolis to rival Los Angeles. Construction began in the late 1950s and early 1960s on housing tracts along what is today Neuralia Road and California City Boulevard (Gagnon 2001). Construction of the community included a Central Park with a 24-acre lake and golf course. Over the next several decades, California City grew to include several subdivisions, a sports arena, and businesses that are still in active use today, but it never grew to the metropolis Mendelsohn had originally envisioned.

## **CHAPTER 3**

### **ARCHIVAL RESEARCH AND CONTACT PROGRAM**

This chapter outlines the results of research conducted to obtain existing information on cultural resources within and/or adjacent to the APE. A records search was conducted by the SSJVIC at California State University, Bakersfield. In addition, historic topographic maps were consulted and a Native American contact program was initiated with a letter to the Native American Heritage Commission (NAHC) requesting a search of its Sacred Lands File and a list of Native American individuals and groups to approach for input. The records search was originally conducted for the entire RE Cinco Project area, including the Project site and gen-tie line alternatives; however, this summary and discussion only address the results pertaining to the solar facility site. Records search result maps are included as Appendix B. A summary of findings is provided below, following the results of the background research.

#### **RECORDS SEARCH**

##### **Previous Studies**

A records search for the proposed Project plus the three gen-tie alternatives, including a 1-mile buffer around the Project boundary and from the center-line of each alternative, was conducted on December 16, 2013, by SSJVIC personnel. The literature search results indicated that 12 previous investigations have been conducted within a 1-mile radius of the Project (Table 5). These consist of 10 survey-level investigations, one site evaluation, and one cultural resources records search and site visit summary report. Four of these investigations overlap with portions of the Project, and one survey covered the entire 600-acre direct effects APE (Hudlow 2011).

In addition, Power Engineers prepared a Class I and Class II Inventory Report for the Barren Ridge Renewable Transmission Project (BR RTP) in 2011, which is not on file at the information center. The northern-most portion of BR RTP's proposed new 230-kV transmission line and 230-kV circuit appears to overlap with the northwest corner of the Project site (Power Engineers 2011). However, the BR RTP study did not include a pedestrian survey (Class II) of this area, so no new information was obtained from the BR RTP report, and all previously recorded resources were captured by the original SSJVIC records search.

##### **Previously Recorded Cultural Resources**

The records search results indicated that seven previously recorded cultural resources are within a 1-mile radius of the Project (Table 6). Of these, only three resources are located within the boundaries of the solar facility site, including one historic refuse scatter (P-15-016275) and two prehistoric isolates (P-15-016273, P-15-016274). The other four identified resources are located within the 1-mile records search buffer zone: three historic resources and a single prehistoric resource. The historic resources are the Los Angeles Aqueduct (CA-KER-3549H), the Southern

Pacific Railroad (CA-KER-3366H), and a refuse scatter with a prehistoric flake isolate (P-15-007706). The prehistoric resource consists of several buried hearth features (CA-KER-3939).

**Table 4. Cultural Resources Investigations within 1 Mile of the Project**

<b>Report Number</b>	<b>Date</b>	<b>Author</b>	<b>Title</b>	<b>Project Overlap</b>	<b>Buffer Overlap</b>
KE-00051	1995	Laylander, Don	Negative Archaeological Survey Report. Highway Project Description: District 09, Kern County, Route 14, post miles 28.3, 30.2, Expenditure Authorization 952137.		X
KE-00634	1985	Macko, Michael E., and Jill Wiesbord	Sylmar Expansion Project: Cultural Resources Inventory and Significant Evaluation, Final Report Vol. 1 & 2, and Addendum.	X	
KE-00649	1987	McManus, James	Archaeological Survey Report for 9-KER-14, PM 25.5-35.7, 09-209300.		X
KE-01967	1985	Speer, Michael	Historical Resource Evaluation Report for a Widening Project on 9-KER-14 near Cinco, Kern County PL 26.0/35.4.		X
KE-01968	1987	Proctor, Martha	Historic Property Survey Report, Jawbone Canyon Expressway Project.		X
KE-01969	1987	O'Connor, Denise	Historical Architectural Survey Report for a Proposed Highway Project on Route 14 in Kern County, CA.		X
KE-02135	1985	McManus, James	Negative Archaeological Survey Report: 09-KER-14, PM 26.0/35.7.	X	
KE-02680	2001	Bevill et al.	Cultural Resources Investigation of Selected Portions of the First and Second Los Angeles Aqueducts, Inyo and Kern Counties, CA and Addendum.		X
KE-03534	2006	Nilsson et al.	Archaeological Inventory of the First and Second Los Angeles Aqueducts and Selected Access Roads, Kern, Inyo, and Los Angeles Counties, CA.		X
KE-03758	2010	Hudlow, Scott M.	A Phase I Cultural Resource Survey Global Real Estate Investment Partners, Proposed Solar Farm, Kern County, California.		X
KE-04260	2011	Hudlow, Scott	A Phase I Cultural Resource Survey for Seven Kern Desert Solar Farm Sites, Kern County, California.	X	
KE-04421	2013	Peterson, Cher	Cultural Resources Records Search and Site Visit Result for AT&T Mobility, LLC, Candidate CLV0626 (Sower's Lot), Southwest Corner of Intersection of 14 Fwy and Phillips Road, Mojave, Kern County, California.	X	

Report Number	Date	Author	Title	Project Overlap	Buffer Overlap
N/A	2011	Power Engineers	Barren Ridge Renewable Transmission Project Cultural Resources Technical Report and Class I and Class II Inventory Report.		X

**Table 5. Previously Recorded Cultural Resources within 1 Mile of the Project**

Primary Number	Permanent Trinomial	Site Type	Site Constituents	Time Period	Date Recorded (or most recent update)	Location
P-15-003366	CA-KER-3366H	Railroad	Southern Pacific Railroad Lake Minerals Railway	Historic	3/1/2010	Buffer
P-15-003549	CA-KER-3549H	Structure	Los Angeles Aqueduct	Historic	11/28/2000	Buffer
P-15-003939	CA-KER-3939	Site	Buried Hearths	Prehistoric	5/27/1994	Buffer
P-15-007706	-	Site	Refuse Scatter and Lithic Isolate	Historic	5/17/1985	Buffer
P-15-016273	-	Isolate	Lithic Isolate	Prehistoric	10/3/2010	Project site
P-15-016274	-	Isolate	Lithic Isolate	Prehistoric	10/3/2010	Project site
P-15-016275	-	Site	Refuse Scatter	Historic	11/21/2010	Project site

## Other Archival Research

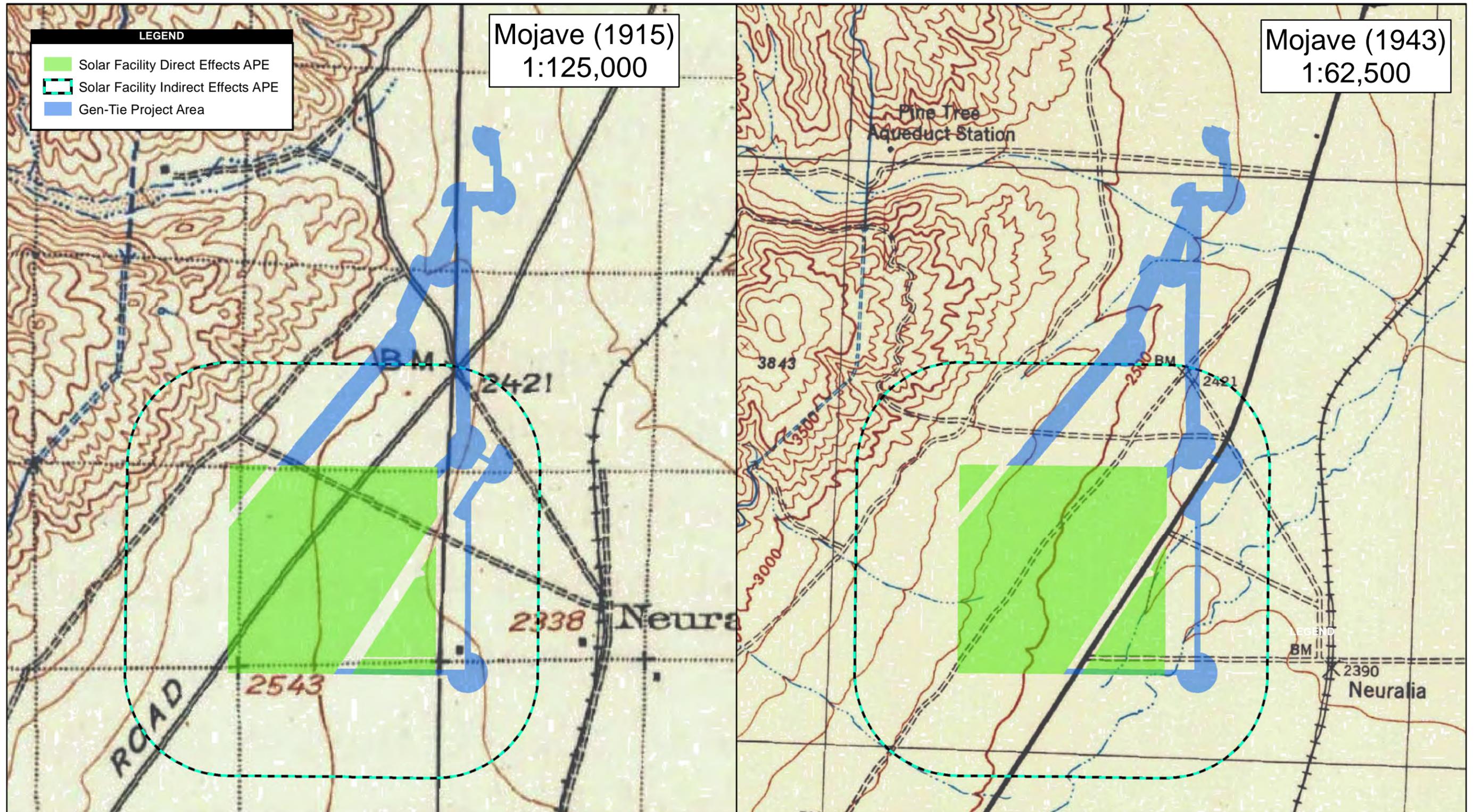
### *Historic Maps*

Numerous historic USGS topographic maps were consulted to identify historic architectural resources (Table 7). No structures were observed within the Project's direct effects APE on any of the historic maps. However, two road segments crossed the direct effects APE as early as 1915. These historic roads were observed during the current survey and recorded as resources CS-S-H-027 and CS-S-H-028. Detailed site descriptions for CS-S-H-027 and CS-S-H-028 are provided in Chapter 5.

Two structures were observed within the Project's indirect effects APE on the historic maps. The first structure appears on Township 31S, Range 36 ½ E, Section 25 of the 1915 map, and the second structure is present on Township 31S, Range 36 E, Section 30 of the 1953 map. Both structures appear to have been demolished sometime during the mid-1900s, as neither appears on maps after 1953. In addition, several road segments crossed the indirect effects APE throughout the 20<sup>th</sup> century. Figures 5 and 6 shows the Project site and APEs (direct effects and indirect effects) on all four historic maps.

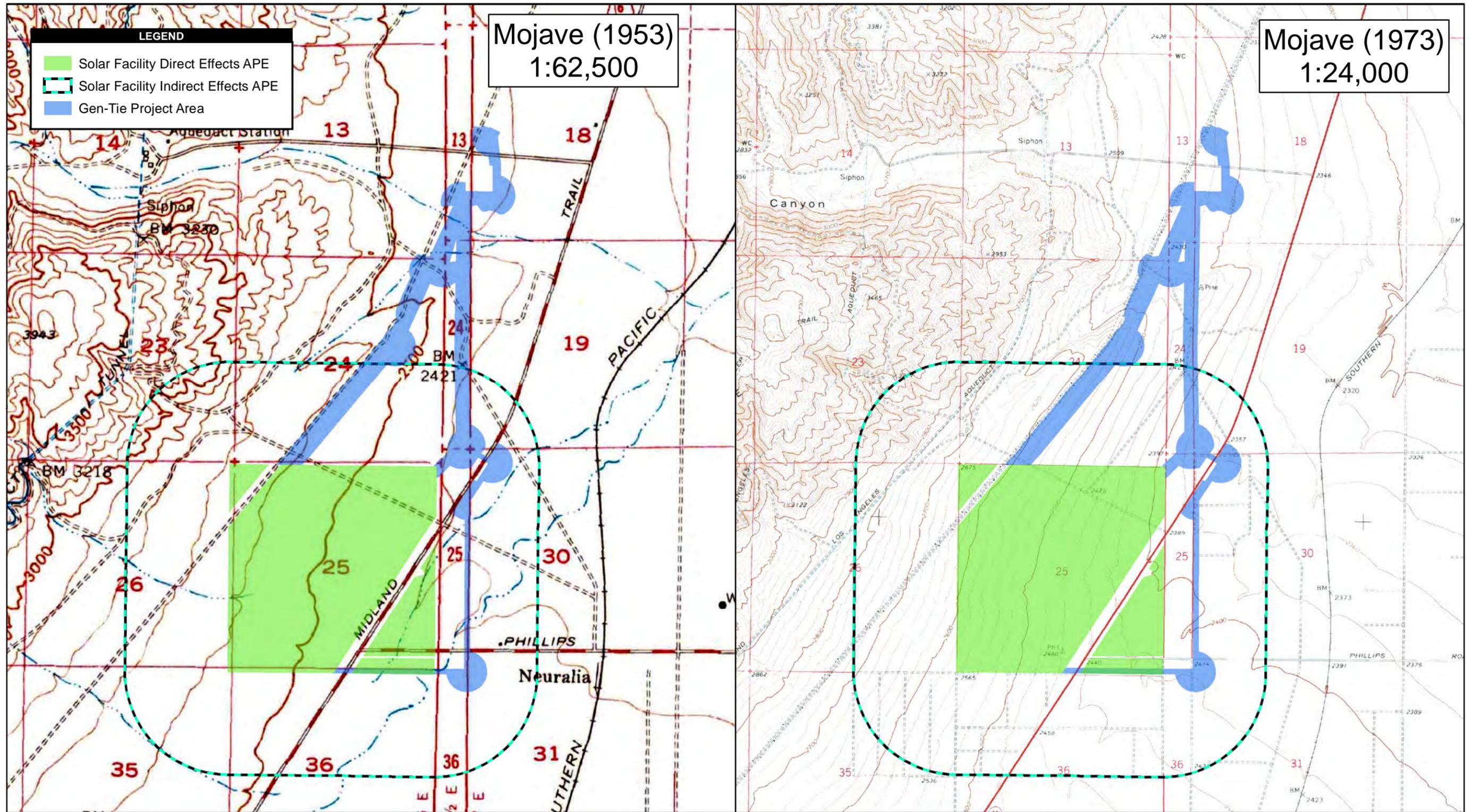
**Table 6. Historical Maps**

<b>Map Name</b>	<b>Scale</b>	<b>Year</b>
Mojave, CA	1:25,000	1915
Mojave, CA	1:62,500	1943
Mojave NE, CA	1:62,500	1956
Mojave NE, CA	1:24,000	1973



Source: RE Astoria, LLC; NETRonline  
 2,500 1,250 0 2,500 Feet  
 Scale: 1:30,000; 1 inch = 2,500 feet

Figure 5  
 Historic USGS Topographic Maps (1915, 1943)



Source: RE Astoria, LLC; NETRonline  
 2,500 1,250 0 2,500 Feet  
 Scale: 1:30,000; 1 inch = 2,500 feet

**Figure 6**  
**Historic USGS Topographic Maps (1956, 1973)**

## CONTACT PROGRAM

### Native American Contact Program

Native American tribes in the Mojave Desert maintain strong traditional ties to the land and to the cultural resources that were left by their ancestors. AECOM sent a letter to the NAHC on January 7, 2014, requesting a search of its Sacred Lands File and a list of Native American individuals and organizations that might have knowledge of or concerns about cultural resources within the study area. A response from the NAHC was received January 9, 2014, indicating that no sacred sites are on file, but the area is known to be culturally sensitive. Eleven Native American representatives were identified by the NAHC (Table 8), and letters were sent to these representatives on January 14, 2014. Follow-up phone calls were made to these individuals on January 20, 2014. Four responses have been received to date.

**Table 7. NAHC Native American Contact Log**

<b>Affiliation</b>	<b>Name/Title</b>	<b>Date of Contact</b>	<b>Discussion</b>
Native American Heritage Commission (NAHC)		1/7/2014	Request letter sent.
		1/9/2014	Received results of Sacred Lands search and Native American contact list.
Tule River Indian Tribe	Neil Peyron, Chairperson	1/14/2014	Initial letter sent.
		1/20/2014	Follow-up phone call. No one answered, so sent follow-up email.
Kawaiisu Tribe of Tejon Reservation	David Laughinghorse Robinson	1/14/2014	Initial letter sent.
		1/20/2014	Phone number not provided by NAHC. Sent email follow-up.
Kitanemuk & Yowlumne Tejon Indians	Delia Dominguez, Chairperson	1/14/2014	Initial letter sent.
		1/20/2014	Follow-up phone call; left message.
Kern Valley Indian Council	Julie Turner, Secretary	1/14/2014	Initial letter sent.
		1/20/2014	Follow-up phone call; left message.

<b>Affiliation</b>	<b>Name/Title</b>	<b>Date of Contact</b>	<b>Discussion</b>
San Fernando Band of Mission Indians	John Valenzuela, Chairperson	1/14/2014	Initial letter sent.
		1/20/2014	Follow-up phone call. Mr. Valenzuela confirmed receipt of letter but has nothing to share with AECOM at this time. Interested in participating in monitoring when construction begins.
San Manuel Band of Mission Indians	Daniel McCarthy, Director, CRM Department	1/14/2014	Initial letter sent.
		1/20/2014	Follow-up phone call; left message.
	Ann Brierty, Cultural Resources Field Manager	1/22/2014	Ms. Brierty called back indicating that the cultural department will discuss this project and provide information on the cultural resources in the area ASAP. In general, the tribe encourages Native American participation in early stages of projects.
Tejon Indian Tribe	Katherine Montes Morgan, Chairperson	1/14/2014	Initial letter sent.
		1/20/2014	Follow-up phone call; left a message.
Kern Valley Indian Council	Robert Robinson, Co-Chairperson	1/14/2014	Initial letter sent.
		1/20/2014	Follow-up phone call; left message.
		1/22/2014	Mr. Robinson called back and indicated that the area contains prehistoric resources, especially near the base of the mountain. He said historic resources are also present, including historic sites, roads, and structures associated with the railroad and the development of California City in the 1950s. He encourages Native American participation at the survey level, because Native perspective is helpful in identifying cultural resources. He is interested in participating in consultation efforts and requested agency contacts.

<b>Affiliation</b>	<b>Name/Title</b>	<b>Date of Contact</b>	<b>Discussion</b>
Tubatulabals of Kern Valley	Robert L Gomez, Jr., Tribal Chairperson	1/14/2014	Initial letter sent.
		1/20/2014	Follow-up phone call. Representative said the Project was not in the recognized boundary of her group and deferred comment to closer tribes.
Tule River Indian Tribe	Kerri Vera, Environmental Department	1/14/2014	Initial letter sent.
		1/20/2014	Follow-up phone call; left message.
Tule River Indian Tribe	Joey Garfield, Tribal Archaeological Monitor	1/14/2014	Initial letter sent.
		1/20/2014	Follow-up phone call; left message.

John Valenzuela of the San Fernando Band of Mission Indians confirmed receipt of the letter but indicated he had nothing to share at that time. He did, however, express interest in participating in monitoring efforts when construction begins. A representative from the Tubatulabals of Kern Valley indicated that the Project is not within the recognized boundary of her group and deferred comment to closer tribes. Ann Brierty from the San Manuel Band of Mission Indians indicated that the general area contains known prehistoric resources, and will provide AECOM with specific information at a later date. Ms. Brierty also stated that San Manuel encourages Native American participation in the early stages of projects. Robert Robinson of the Kern Valley Indian Council indicated that prehistoric resources are present in the vicinity of the Project, especially near the base of the mountain. He said historic resources, including sites, roads, and structures associated with the railroad and the development of California City in the 1950s, are also present near the Project. Mr. Robinson encouraged Native American participation at the survey level, because a native perspective is helpful in identifying cultural resources.

In addition, USFWS requested that Native American participation be included as part of the pedestrian survey, and provided AECOM with a list of 20 individuals to contact. On April 28, 2014, AECOM sent emails and/or made phone calls to each of the 20 Native American contacts, inviting them to participate in the survey. Follow-up phone calls were conducted the following week. Six responses were received (Table 9). Three tribes expressed interest in participating in the survey: the San Manuel Band of Mission Indians, Kern Valley Indians, and the Kern River Paiute Council. AECOM was able to coordinate with San Manuel and Kern Valley to provide a Native American representative to participate in the survey. The Kern River Paiute never provided AECOM with contact information for potential participants, and, therefore, did not participate in the survey. The Native American Contact Program in its entirety is included as Appendix C.

**Table 8. Class III Survey Native American Contact Log**

<b>Affiliation</b>	<b>Name/Title</b>	<b>Date of Contact</b>	<b>Discussion</b>
Big Pine Paiute Tribe of the Owens Valley	Genevieve Jones, Chairperson	4/28/2014	Invite sent via email. Email address invalid, but THPO email address valid.
	Bill Helmer, THPO	4/28/2014	Copied on invite letter sent via email.
		5/6/2014	Follow-up call; left voice message.
Bishop Paitue Tribe	Chad Delgado, Chairperson	4/28/2014	Invite sent via email.
	Raymond Andrews, THPO	4/28/2014	No valid email address on file. Invite sent via USPS.
		5/6/2014	Follow-up call; left voice message.

<b>Affiliation</b>	<b>Name/Title</b>	<b>Date of Contact</b>	<b>Discussion</b>
Fort Independence Band of Paiute Indians	Israel Naylor, Chairman	4/28/2014	Invite sent via email.
	Priscilla Naylor, Cultural Liaison	4/28/2014	No valid email address on file. Invite sent via USPS.
		5/6/2014	Follow-up call; left message with secretary.
Kawaiisu Tribe	Harold Williams	4/28/2014	No valid email address on file. Invite sent via USPS.
		5/6/2014	Follow-up call; left voice message.
Kern River Paiute Council	Patricia Henry, Chairperson (760) 549-0800	4/28/2014	Invite sent via email.
		5/6/2014	Follow-up call and spoke with Ms. Henry. She indicated that the Kern River Paiutes are interested and to let them know when the surveys are scheduled. Invite resent via confirmed email per her request.
		5/7/2014	Emailed Ms. Henry requesting a list and resumes of potential monitors who are approved to represent her tribe.
		5/9/2014	Follow-up call about list of potential monitors and left a message for Ms. Henry with the secretary.
		5/13/2014	Final follow-up call. Spoke with secretary who said they did not receive any of three emails, although they never bounced back to AECOM. She emailed me from her address and AECOM responded by resending all previous emails.
Kern Valley Indian Council	June Price, Co-Chairperson	4/28/2014	Invite sent via email.
		5/6/2014	Follow-up call. Referred to Bob Robertson.
	Bob Robertson, Historical Officer/Watershed Coordinator	4/28/2014	Invite sent via email.
		5/6/2014	Follow-up call. Wrong number, but got correct numbers. Left voice message.

<b>Affiliation</b>	<b>Name/Title</b>	<b>Date of Contact</b>	<b>Discussion</b>
		5/7/2014	Emailed Mr. Robertson requesting a list and resumes of potential monitors who are approved to represent his tribe.
		5/9/2014	Follow-up call about a list of potential monitors. Left voice message at both numbers. Mr. Robertson called back and identified a potential monitor (Brandy Kendrick). He will coordinate with her and call back.
	Brandy Kendrick, Native American Monitor	5/9/2014	Brandy Kendrick called and left a voice message.
		5/12/2014	Returned Ms. Kendrick's phone call and left her a voice message.
		5/13/2014	Called Ms. Kendrick and she indicated that she was available and interested. I informed client via email that she will be Kern Valley Indians Native American representative for survey.
		5/19/2014– 5/23/2014	Ms. Kendrick participated in survey.
Lone Pine Paiute-Shoshone Tribe	Mary Wuester, Chairperson	4/28/2014	No valid email address on file. Invite sent via USPS.
	Melvin Joseph, Environmental Coordinator	4/28/2014	Invite sent via email.
		5/6/2014	Follow-up call. Left message with secretary.
Monache Intertribal Council		4/28/2014	Invite sent via email.
		5/6/2014	Follow-up call. Ron Wermuth (Council Chairman) passed away last August, but his wife referred AECOM to Bob Robertson.
San Manuel Band of Mission Indians (SMBMI)	Carla Rodriguez Lynn Valbuena, Chairwoman	4/28/2014	Invite sent to Chairwoman Rodriguez via email. Ann Brierty informed AECOM that Lynn Valbuena is new chairwoman.

<b>Affiliation</b>	<b>Name/Title</b>	<b>Date of Contact</b>	<b>Discussion</b>
	Daniel McCarthy, Cultural Resources Management Department	4/28/2014	Copied on invite letter sent via email.
	Ann Brierty, Cultural Resources Coordinator	4/28/2014	Copied on invite letter sent via email. She replied that SMBMI has a new chairwoman, Lynn Valbuena.
		5/6/2014	Follow-up call. Ms. Brierty indicated that tribe was interested in participating and can provide resumes and/or contact info of potential participants if needed. Requested additional info when available.
		5/7/2014	Emailed Ms. Brierty requesting a list and resumes of potential monitors who are approved to represent her tribe. She sent a list and resumes for five individuals via email.
		5/9/2014	Ms. Brierty called to confirm receipt of list and resumes and requested a site visit during survey efforts. Informed her that AECOM received the information and an SMBMI Native American participant has been chosen. AECOM provided her with several potential dates for a site visit.
		5/19/2014	Emailed Ms. Brierty to schedule site visit. Site visit confirmed for Wednesday, 5/21/2014.
		5/21/2014	Conducted site visit.
	Steven Brierty, Native American Monitor	5/9/2014	Based on resumes, Steven Brierty is the most qualified. Called and emailed him about his availability. Mr. Brierty called back and indicated he was available and interested. AECOM informed client via email that he will be SMBMI Native American representative for survey.
		5/19/2014– 5/23/2014	Mr. Brierty participated in the survey.

<b>Affiliation</b>	<b>Name/Title</b>	<b>Date of Contact</b>	<b>Discussion</b>
Timbi-sha Shoshone Tribe	George Gholson, Chairman	4/28/2014	Invite sent via email. Email address was invalid but THPO address was valid.
	Barbra Durham, THPO	4/28/2014	Copied on invite sent via email.
		5/6/2014	Follow-up call. Spoke with Ms. Durham and she indicated that the tribe will defer to closer tribes. AECOM sent her BLM and USFWS agency contacts so that she may formally put that on record.
Tubatulabals of Kern Valley	Robert Gomes, Chairperson	4/28/2014	Invite sent via email. Email address invalid, so hard copy was sent via USPS.
		5/6/2014	Follow-up call. Spoke with secretary and she indicated that the Project is out of their traditional area so Mr. Gomes would probably not be interested in participating, but he will call if he is.
Owens Valley Career Development Center	Qwina West	4/28/2014	Invite sent via email.
		5/6/2014	Follow-up call. Wrong number. Sent follow-up email instead.

THPO = Tribal Historic Preservation Office  
USPS = U.S. Postal Service  
USFWS = U.S. Fish and Wildlife Service

## CHAPTER 4 METHODOLOGY

### SURVEY METHODS

Prior to field work, it was determined that methods for the archaeological survey of the direct effects APE should be consistent with those used for the related RE Cinco Gen-Tie Line Project; thus, AECOM followed the survey methodology described in the RE Cinco Gen-Tie Line Project Work Plan (Work Plan) (AECOM 2014). Because the Work Plan was prepared in accordance with requirements outlined in the BLM's Foundations for Managing Cultural Resources (BLM Manual), the BLM Manual also guided the Project direct effects APE survey efforts. This methodology is described below.

Between May 19 and May 25, 2014, Project archaeologists conducted an intensive pedestrian survey of the approximately 600-acre direct effects APE. Following the guidelines in Section 8110 of the BLM Manual, the Class III survey was an intensive pedestrian survey designed to identify all cultural properties "locatable from surface and exposed profile indications" within the "target area" defined by the Project disturbance areas (BLM 2004:19). The survey was conducted by a qualified four- to six-person survey team, led by a Secretary of Interior Professionally qualified crew chief. A maximum survey interval of 15 meters was employed, although crew members frequently walked between transect lines to record isolated artifacts and sites.

When archaeological sites were encountered, the survey crews determined the location of the site using sub-meter global positioning system (GPS) units, and then flagged, mapped, and recorded the site. Site recording included intensive survey of the area, along with photographic documentation (site overviews and detail shots with diagnostic artifacts), site sketch maps, artifact and feature descriptions, and descriptions of the environmental context. Sub-meter GPS units were used to document the location of cultural resources within each site. To better preserve the cultural resources, archaeological teams did not collect any artifacts or other materials during the survey. Artifacts were documented and identified in the field by experienced crew members.

Isolated single artifacts and collections of two or fewer artifacts that were separated from other cultural materials by more than 30 meters were recorded as isolated finds, or isolates. The location of each isolated find was recorded with a sub-meter GPS unit and the artifacts were documented by the survey crews immediately. Where necessary, drawings and photographs were made of distinctive artifacts, maker's marks, and other culturally or chronologically sensitive indicators.

The survey crews also attempted to relocate previously reported site locations as documented at the SSJVIC. To guide field studies, field crews used 7.5-minute USGS topographic maps and large-scale aerial photographic maps. Previously recorded sites were only re-mapped or otherwise re-recorded if the existing records required updating due to a change in the site condition or configuration.

## **Documentation**

Sites identified during the surveys were documented in detail to allow for the completion of all appropriate Department of Parks and Recreation (DPR) 523 forms. Minimally, these include primary forms (Form 523A), Archaeological Site Records (Form 523C), location maps overlaid on a USGS topographic map (Form 523J), and a sketch map (Form 523K). Sketch maps included a site datum, features, artifacts concentrations, and other cultural elements. Other resources potentially required a Linear Feature Form (Form 523E) if a linear feature (such as road or trail) was present within a site. Apparent clusters of artifacts were recorded as concentrations. Elements of sites that could not be removed (i.e., hearths, mining claims, bedrock features) were recorded as features. In addition to the information required for DPR site forms, detailed field notes were produced for each site. Field notes contained information about site impacts, geology, and vegetation, and diagnostic information about cultural materials.

All isolates identified in the Project area were recorded on a primary form and USGS location map. Resource locations were determined using a sub-meter GPS unit. All completed DPR site forms will be sent to the SSJVIC for the assignment of primary number designations in the state inventory system.

## **SITE TYPES**

The Class III intensive pedestrian surveys were designed to identify and evaluate Project archaeological sites to the extent possible on the basis of surface observations (BLM 2004). Before the commencement of fieldwork, senior Project archaeologists outlined the types of cultural resources that were likely to be encountered, and the relevance of such resources for the investigation of regional research issues. Sites types and research issues common to the Mojave Desert were compiled in the Work Plan (AECOM 2014) to facilitate the consistent identification of Project sites during survey. Sites were identified as prehistoric, historic, or multi-component (containing both prehistoric and historic) cultural resources. Site types expected and encountered on the desert are listed below, followed by a discussion of the relevant research issues and themes within which they might be profitably addressed.

### **Prehistoric Site Types**

#### ***Lithic Scatters***

This resource category, which can range from a single-episode flaking station to larger scatters, is the most frequently occurring previously recorded prehistoric archaeological site in the area. Most of these sites in the area consist of cryptocrystalline (CCS) materials such as cherts and chalcedony. These materials may be locally derived from cobbles, or they may have been procured from bedrock sources in the nearby El Paso Mountains to the north (Davis and Panlaqui 1978:32). Consequently, these lithic scatters may contain either initial stages of cobble reduction or later-stage reduction of quarried materials. Materials such as obsidian also occur, but are not locally available, and would have been obtained by travel to, or trade from, the Coso Mountains farther to the north of the Project area. Although lithic scatters are generally interpreted by archaeologists as places where toolstone acquisition and tool manufacture and maintenance

occurred, Native American representatives have pointed out that certain ritual activities also result in the production of scatters of flaked stone materials (e.g., Cachora 1994). Based on the archival research, records search, and Native American Contact Program, this site type is the most likely prehistoric site to be encountered in the survey area.

### ***Habitation Sites***

This prehistoric resource category can encompass a number of other individual archaeological site types when they occur together. Habitation sites typically show evidence of a variety of occupation debris, including multiple artifact classes, subsistence remains, fire-affected rock, and/or domestic architecture. Habitation sites can also include milling features; rock shelters; lithic scatters; ceramic scatters; living areas; cooking hearths; subsistence remains (fish or mammal bone); middens; artifact scatters; and, often, discrete activity areas such as lithic reduction, milling, or other subsistence-related locales. The presence of some or all of these features and a varied artifact assemblage, along with midden deposits and faunal food remains, serves to define a site as a habitation site. This type of site, although possibly present in the vicinity, is unlikely to be encountered in the survey area.

### ***Ceramic Scatters***

Prehistoric ceramics are known to occur in the western Mojave Desert in general (Zigmond 1986), and in the Fremont Valley area specifically (Lyneis 1991). Zigmond (1986:401) indicates that although the Kawaiisu may have first procured pottery from the Owens Valley Paiute, they later also began to make their own. He does not, however, believe that they ever made pottery in significant quantities, and, instead, retained their affinity for the manufacture and use of baskets. Although isolated scatters or sherds could occur locally, it is expected that pottery would most frequently occur in proximity to habitation sites.

### ***Human Remains***

Human remains are highly sensitive culturally and are subject to special protection under the Native American Graves Protection and Repatriation Act (NAGPRA). Although relatively rarely encountered, archaeological sites with prehistoric human remains have been recorded in the Western Mojave region (Gardener and Sutton 2010; Robinson 1982).

## **Historic Site Types**

### ***Refuse Scatters and Dumps***

This resource category is the most frequently occurring previously recorded historic archaeological site type in the area. Sites of this type can range from small, discrete deposits to large, sparse scatters of domestic, commercial, or industrial debris (cans, bottles, machinery, and appliances). Often these are found along trails or dirt roads, making associations difficult to establish. Such scatters and dumps can also be associated with discards from ranching and farming activities for which the original association is no longer evident (e.g., no structures currently nearby).

Refuse disposal scatters and dumps can be broken down into three types:

1. Dump sites – areas where active dumping of accumulated refuse has occurred over time. Dump sites may grow into larger sites, such as town dumps, as they are known and used by a nearby community.
2. Refuse scatters – areas where historic debris is common, but not necessarily associated with active, organized, repetitive dumping of accumulated refuse. Although refuse scatters may be characterized by more than one dumping episode, they often represent a single episode where dumping occurred.
3. Roadside litter – isolated debris from vehicles rapidly moving through an area. This type is usually associated with automotive travel from the mid-20th century to the present. It typically results in isolated artifacts or small debris scatters from window or roadside disposal.

### ***Early Farms and Ranches***

Archaeological and historic architectural remnants of 19th and early to mid-20th century farms and ranches include scattered residential, ranching, and agricultural structures, and features such as foundations and domestic trash dumps. These structures and features reflect the early settlement of the area.

### ***Transportation Routes***

Transportation routes consist of historic trails, roads, and railroad lines. The condition of the roads may vary from faint two-tracks to graded or paved alignments, where the route, not the road material, is significant. Historic rail lines can include existing railroads, abandoned railroad lines, railroad beds, and mining transport rail lines.

### ***Historic Camps and Temporary Settlements***

Types of camps include construction camps for linear facilities (e.g., railroads, transmission lines, water conveyance, hydroelectric) and mining camps and settlements. Evidence of camps and temporary settlements may include campfire/hearths and/or debris and refuse scatters.

### ***Historic Cairns***

Rock piles can be associated with historic mining claims or early survey markers. These can vary in size and composition. Sometimes a can in the cairn will contain information regarding a claim.

### ***Utility and Water Conveyance Features***

Utility facilities can include electric or telephone pole lines, flumes or aqueducts for water transport, culverts, channels, and dams.

### **Isolated Finds**

Isolated finds can be either historic or prehistoric and consist of single, occasionally multiple, artifacts. As a rule, less than three artifacts in an area 30 meters or less in diameter with a distance of 30 meters or more to any other artifact constitutes an isolate. Isolates have been found on a variety of surfaces, including alluvial plains, gravel beds, and washes.

## RESEARCH ISSUES AND THEMES

The intent of this research design is to provide a framework for analysis of the archaeological resources within the survey area and to analyze them in relation to established cultural chronologies and their ability to address research issues within the cultural and natural contextual settings for the western Mojave Desert study region.

### Research Issues – Prehistoric Archaeological Sites

Fremont Valley is a closed basin on the eastern side of the Sierra Nevada. Prehistorically, it could have provided food resources such as grass seeds and other plants, as well as some game. Available surface water, however, would appear to have been a limiting factor, at least seasonally and through much of later prehistory and the historic periods. Consequently, it might be expected that evidence of habitation will mostly reflect temporary activities of small numbers of people. Because bedrock outcrops are unlikely to be present in the Project area, small reduction sites focused on cobbles from the nearby mountains are likely to be the most common site type encountered. Although substantial cultural midden deposits may not be anticipated, subsurface prehistoric archaeological deposits have been found in the region where they were not expected (Apple et al. 2008; Cooley 2011; Gardner 2002; Gardner et al. 2006; Young 2009).

Although researchers are constrained with regard to the range of research questions that can be answered based on survey-level data, pertinent research issues concerning site distribution, general function, complexity, and temporal placement can be addressed. In the previously presented cultural setting for the region, questions and issues were noted relating to prehistoric research topics such as chronology; subsistence, settlement, and mobility; lithic technology, procurement, and utilization; trade and travel; and cultural affiliation and linguistic prehistory.

#### *Chronology*

The ability to place a prehistoric site within a temporal framework is often of critical importance in assessing significance. Establishing the date a site was occupied is necessary in describing the site's cultural context and in assessing its research potential.

Within the survey area, the following data sets are considered relevant to establishing temporal affiliation:

- Presence of organic materials suitable for radiocarbon dating – Radiocarbon dating remains the most reliable chronometric tool available for the Project region. Presence of suitable organic material substantially increases a site's research value.
- Presence of stratified deposits – Stratified cultural deposits, which are quite useful in developing regional chronological sequences, are relatively rare in the region. Many habitation sites are found on relatively stable surfaces, resulting in a lack of clear stratigraphic separation between occupation periods.

- Presence of prehistoric ceramics – Prehistoric Brownware ceramics have been found within Fremont Valley (Lyneis 1991). However, they are relatively rare, and additional studies are necessary to better assess their cultural affiliation.
- Presence of typable projectile points and other formal tools – Despite challenges to the basic assumptions of projectile point seriation in the Great Basin (Flenniken and Wilke 1989), cross-dating of point types through associated radiocarbon dates and, in the western Great Basin, directly through obsidian hydration dating, continues to support the temporal utility of point types (Bettinger et al. 1991). However, several types, including some Pinto/Gatecliff and Elko series points, appear to vary in their temporal placement across the broad expanse of the Great Basin (see Beck 1994). Notwithstanding this problem, the point sequence used by Warren and Crabtree (1986) remains generally valid for the Mojave Desert.
- Presence of obsidian suitable for hydration dating – The Project area is relatively close to the Coso obsidian source, and it is expected that flaked tools and debitage from this source could be recovered. This source of volcanic glass has been intensively studied for hydration dating purposes (Basgall 1990; Cleland 2006; Gilreath and Hildebrandt 1997; Rogers 2006). Despite numerous problems, hydration analysis of Coso obsidian has been generally successful producing results accurate enough for chronological ordering (seriation) and placement of assemblages within a reliable range of dates.

### *Research Questions*

Based on the presence of one or more of these data sets, the following research questions could be asked:

1. What is the best available information relevant to the temporal placement of each site?
2. Is there evidence that the site is single component? If not, can the components be segregated (horizontally and/or vertically) for analytical purposes?
3. Is there evidence relevant to the length of occupation of the site or site components?
4. Can the site yield information relating to established regional lithic and ceramic typologies?

### *Site Structure*

Assessing the horizontal and vertical organization of archaeological materials at a site is necessary for determining whether there are multiple periods of occupation at the site or distinct activity loci. Although vertical (subsurface) understanding of site structure most often requires excavation to assess, some surface indications of possible subsurface content can be observed during field survey. Consideration of the geomorphic context of the sites (e.g., Young 2009) prior to survey, especially with regard to the processes affecting deposition and erosion, may suggest potential circumstances for the presence of certain types of prehistoric sites. Some prehistoric sites in the Project area may lie on the surface of an ancient dry lake bed, such as the Koehn Lake playa, which was a pluvial lake in the Fremont Valley during the latest Pleistocene, circa 12,000 B.P. (Grayson 1993; Lemmer and Escandon 2008), fed by runoff from the Tehachapi, Sierra Nevada, and El Paso Mountains. The lake had dried by 8700 B.P. (Lemmer

and Escandon 2008), and probably earlier due to its small size (see Grayson 1993), but continued to hold intermittent water in response to precipitation cycles through the historic period. Downwarping along the Garlock Fault creates a generally accretionary depositional environment (Lemmer and Escandon 2008). This process of basin in-filling, however, could be counter-balanced to some degree by aeolian erosion of the finer sediments, such as those on a lake bed itself. An additional consideration for the lake bed is that 20th-century agricultural practices, including plowing, resulted in the disturbance of the upmost sediments to an estimated depth of 50 centimeters or so.

### *Horizontal Structure*

Where distinct occupations or activities can be isolated, the informational value of associated materials is enhanced. For example, discrete artifact accumulations may reflect multiple temporal occupations or synchronic organization of space within a short-term habitation site. Similarly, discrete flaking stations may be more useful in analyzing lithic reduction than generalized lithic scatters. In the survey area, horizontal structure may persist even through repeated modern period plowing so severe as to smear the cultural deposit to the point where horizontal patterning is no longer useful.

Depending on the depth of a site deposit, surface materials may not adequately expose the full informational potential of a site. Sites with a distinctive subsurface deposit are likely to contain useful information in addressing a variety of regional research questions. Moreover, the presence of substantial numbers of surface artifacts may be indicative of the presence of more deeply buried deposits and features that can only be detected with future subsurface methods (Ahlstrom 2006; Schroedl 2006).

Within the survey area, the following data sets are considered relevant to addressing research questions related to site structure:

- Sites with minimal disturbance that retain distinctive and intact surface and subsurface deposits.
- Sites containing discrete artifact accumulations such as flaking stations or hearths.
- Sites situated in identifiable geomorphic circumstances to allow for reconstruction of site deposit formation processes.

### *Research Questions*

The following research questions relating to site structure may have the potential to be addressed by sites in the Project area:

1. Are cultural materials in their primary context or substantially redeposited?
2. Are there distinct artifact concentrations indicative of distinct loci of human activity?
3. Is there evidence for constructed features?
4. Is there evidence of a subsurface component, and if so, what depositional mechanism may account for it? Is there evidence exposed of buried features in the subsurface

component such as fire pits or cache pits that may retain integrity after plowing or disturbance by natural agents such as erosion?

### ***Subsistence, Settlement, and Mobility***

This research theme addresses the role the Project area served in prehistoric subsistence activities, recognizing that site locations, artifact assemblages, and associated ecofactual evidence reflect, in part, the ways that prehistoric societies organized their subsistence activities.

#### *Land Use at the Desert/Mountain Interface*

The archaeological evidence suggests that, by late Gypsum period times, the western Mojave Desert was used by groups whose core territory also included the major mountain ranges to the west—the Transverse ranges and the southern Sierra Nevada (Sutton et al. 2007). The Project area is close to the foot of the Tehachapi Mountains, near the mouth of Pine Tree Canyon, a prominent canyon that yields access to the mountains. As such, the Project area could have been relatively easily exploited from logistical base camps located within the canyon or nearby foothills. Resource gathering and processing sites would be expected under that type of scenario. Alternatively, residentially more mobile groups may have established temporary residences within the Project area. Distinguishing among these site types is difficult, but site composition and structure and the presence of floral and faunal remains are important data sets to allow for consideration of these issues.

The Project location on the valley floor may be suggestive of certain types of subsistence activities. In similar locational circumstances in areas adjacent to the Project, scatters of fragmentary groundstone and fire-affected rocks have been noted, suggestive of subsistence activities that may have focused on the procurement and processing of floral resources (Apple et al. 2008; Cooley 2011). Residues in such hearth features, if present, could provide important information on specifically targeted resources. Additionally, Sutton and colleagues (2007) have drawn attention to climatic variability as important in understanding changing land use in the western Mojave. Paleoenvironmental data suggest that the latest period of prehistory (circa 800 to 200 B.P.) was particularly prone to decadal to century-long variability in precipitation, with two particularly significant drought cycles occurring during the Medieval Climatic Anomaly (Jones et al. 1999; Stine 1994). It might be expected, therefore, that sites in the Project area could show evidence for increased use during relatively mesic environmental conditions and reduced use during more arid periods.

#### *Other Factors Affecting Site Distributions*

Most settlement pattern studies in the Mojave Desert start with the premise that prehistoric site distributions primarily reflect the organization of subsistence activities. However, in marginal environments, it is also important to consider nonsubsistence activities (Cleland 2004). For example, the Project area may have been located along a travel corridor connecting the Tehachapi Mountains with the desert to the east. Additionally, it is noteworthy that a rock art complex is found in nearby Jawbone Canyon, suggesting the possibility that ceremonial activities could contribute to the distribution of sites in the Project area.

Within the survey area, the following data sets are considered relevant to addressing research questions related to site settlement, subsistence, and mobility:

- Sites containing groundstone tools and fire-affected rocks that could be suggestive of subsistence activities that may have focused on the procurement and processing of floral resources.
- Sites with assemblages containing tools such as projectile points and scrapers associated with hunting activities indicative of subsistence activities that may have focused on the procurement and processing of faunal resources.
- Sites with specific resource procurement functions such as quarries or flaking stations.
- Sites containing a variety of artifact types indicative of more intensive occupation and possibly longer-term habitation.

### *Research Questions*

The following research questions are relevant to this research theme:

1. What subsistence-related activities, if any, are represented at each site?
2. Are there non-portable artifacts or features present?
3. Is there evidence of domestic habitation debris indicative of residential use? If so, is there any evidence relevant to the length of stay or seasonality?
4. Is there any evidence of caching in the sites?
5. To what degree can the archaeological remains aid in the classification of regional settlement and mobility systems with respect to mobility type, frequency, and range?
6. Does the frequency or intensity of occupation of sites in the Project area correlate with reconstructed patterns of paleoenvironmental change?
7. Is there evidence to suggest that a site is primarily related to nonsubsistence functions?

### ***Lithic Technology and Utilization***

Although sites associated with flaked stone artifacts and waste products may be the most common surface sites in the Project survey area, groundstone tools may be relatively rare. Agricultural disturbance may obscure more robust assemblages, but even simple assemblages can be useful in reconstructing resource procurement and mobility strategies.

### *Flaked Stone Technology*

The ways that hunter-gatherers chose to organize the procurement, manufacture, and discard of flaked stone tools vary in relationship to several factors, including the relative availability and quality of toolstone within their territorial range, intended tool functions, the frequency and nature of residential moves, organization of work groups, and division of labor (e.g., Bamforth 1990; Beck et al. 2002; Eerkens et al. 2007; Kelly 1988). Hence, the recording of lithic technology can be useful in addressing more general questions regarding territoriality, mobility, settlement patterns, and down-the-line exchange. For example, highly mobile peoples may “gear up” when they encounter knappable toolstone (Kelly and Todd 1988). In doing so, they discard

curated tools, often from distant sources. Changes in toolstone procurement behavior may be reflective of intensified subsistence procurement within more restricted territories and/or changes in the scheduling and directionality of seasonal subsistence-related residential mobility. Since the location of the Project area was not likely a source of usable toolstones, any flaked or groundstone material would have to have been brought to the site and would, thus, be useful in reconstructing mobility and resource procurement strategies.

Desert pavements in the western Mojave often contain sources of knappable toolstones, including CCS silicates (e.g., chert and chalcedony) and basalt. California City, near the Project area, is known as a source of such lithic materials. Also, as mentioned above, the Coso obsidian source is within a possible range of direct procurement, or may have been relatively obtainable through exchange networks. Excavations near the Project area yielded relatively high frequencies of chalcedony, rhyolite, and obsidian (Sutton 1991, 1993).

### *Groundstone Technology*

Because of high transport costs, groundstone tools are often cached or left in situ in places where mobile groups intend to return. As such, these tool types may be good indications of a location of relatively frequent and/or long-term use. Also, because of transport costs, toolstones from distant sources are particularly noteworthy in terms of the implications for regional mobility and exchange relationships.

Within the survey area, the following data sets are considered relevant to addressing research questions related to lithic technology and utilization:

- Presence of intact flaked lithic reduction sites to allow for analysis and reconstruction of reduction methods and sequences.
- Presence of flaked lithic or groundstone tools that retain patterns of wear indicative of tool function and use.
- Presence of flaked lithic or groundstone tools in undisturbed contexts to allow for possible interpretation of patterns of mobility.
- Presence of intact flaked lithic reduction sites at source locations to allow for analysis of lithic resource procurement patterns.

### *Research Questions*

The following research questions are relevant to this research theme:

1. What types of raw materials were used in the production of flaked and groundstone tools?
2. Can the sources of these materials be identified?
3. Is the use and/or production of bifaces present? If so, what production stages are present?
4. Are expedient core/flake technologies present? If so, what stages of production are present?

5. Is there evidence on-site for procurement of locally available toolstone?
6. What can be inferred about prehistoric settlement and mobility patterns from the toolstone assemblages?

### ***Trade and Travel***

Surface materials encountered during the survey may provide some limited information related to these questions for this topic. Most of the previously recorded prehistoric sites consist of lithic reduction locations. The materials in these sites most often consisted of CCS materials such as chalcedony and/or chert. These materials may be locally derived from cobbles, or they may have been procured from more distant sources by travel or trade. Such CCS materials are known, for example, to all be present in bedrock sources in the nearby El Paso Mountains, approximately 25 miles to the north (Davis and Panlaqui 1978:32). CCS materials could also have been obtained from gravel sources in the western Mojave Desert to the east, within approximately 100 miles of the Project area (Campbell and Campbell 1937; Heiser and Treganza 1944; Nakamura 1991). More distant sources include gravels present along the Colorado River to the east (Singer 1984:42). Materials such as obsidian also occur, but are not locally available, and would have been obtained by travel to, or trade from, the Coso Mountains farther to the north from the Project area. Groundstone tools would have been made from granitic rocks, granite, and granodiorite, all available within a short distance from the Project area in the adjacent Sierra Nevada Mountains, but more likely from the even closer, if not on-site, alluvial fans in the valley derived from these mountains. These toolstone materials would indicate both local and more distant sources, suggesting local procurement as well as possible travel and/or trade to/from more distant locales.

Within the survey area, the following data sets are considered relevant to addressing research questions related to trade and travel:

- Presence of obsidian suitable for sourcing – The Project area is relatively close to the Coso obsidian source, and it is expected that flaked tools and debitage from this source would be the most likely to be recovered. Coso obsidian could have been obtained either by trade or travel. Other sources are possible, including Casa Diablo and Mt. Hicks north of Coso, Obsidian Butte in Southern California, and Napa Valley in the North Coast ranges. Materials from any of these latter sources would be strongly suggestive of trade.
- Presence of beads and ornaments – Shell beads are indicative of trade networks in California (Bennyhoff and Hughes 1987; Davis 1961).
- Presence of pottery materials associated with neighboring groups such as the Tubatulabal.

### ***Research Questions***

The following research questions are relevant to this research theme:

1. Is there evidence of exotic materials such as shell artifacts or non-local toolstone that would indicate prehistoric import from, or trade with, distant areas?

2. Is there evidence of reorganization of economic networks? Changes in the frequency of Coso obsidian might be particularly relevant to this issue, since the frequency of this toolstone declines fairly rapidly to the east.

### ***Cultural Affiliation and Linguistic Prehistory***

For at least 50 years, archaeologists, linguists, and Native American groups have researched whether the Numic branch of the Uto-Aztecan language family originated in the southwestern Great Basin and adjacent mountain ranges and spread northward and eastward until it reached most of the region during the past 1,000 years (Lamb 1958; Rhode and Madsen 1994). The Project area is within the area generally considered to be the possible homeland of the southern Numic languages, and archaeological sites within this general area may have data relevant to the debate. Particularly relevant would be evidence for population growth within the purported homeland, evidence for changes in interaction spheres, and evidence for the development of new adaptive strategies (Bettinger and Baumhoff 1982). Sutton and others (2007) have suggested that the expansion of Numic-speaking people out of the southwestern Great Basin may have been correlated with the drought cycles of the Medieval Climatic Anomaly.

Within the survey area, the following data sets are considered relevant to addressing research questions related to cultural affiliation and linguistic prehistory:

- Presence of obsidian suitable for sourcing.
- Presence of artifacts such as shell beads, diagnostic projectile point types, and ceramics that can be associated with particular linguistic groups.
- Presence of several of the data requirements noted for the other research topics, such as those related to trade and travel, and to settlement and land use, which, if present, can serve to contribute information to this topic.

### ***Research Questions***

The following research questions are relevant to this research theme:

1. Do sites in the Project area contain evidence reflective of significant changes in population density or settlement patterns?
2. Do sites in the Project area contain evidence of reorganization of economic networks? Changes in the frequency of Coso obsidian might be particularly relevant to this issue, since the frequency of this toolstone declines fairly rapidly to the east.
3. Are there sources of genetic information at any of the sites? In the unlikely event that human remains are present in the Project area, the landowner would need to consult with the state-appointed Most Likely Descendant about respectful treatment for remains found on private land, or follow NAGPRA protocol if remains are uncovered on federal land. In the context of this consultation, it should be determined if DNA-extraction would be permissible. If so, this could be an important data source in the Numic-spread debate.

## Research Issues – Historic Sites

Anticipated historic-period archaeological sites include refuse scatters, possibly farming features and equipment, or camps associated with the construction of the railroad or the aqueduct. While the most common historic resources in the Project area are likely to be trash scatters and refuse deposits, historic research for the BLM survey area suggests that sites associated with transportation, ranching/farming, and power and water conveyance could also be encountered during the survey.

### *Patterns of Refuse Disposal and Consumer Behavior*

In rural/desert contexts, household refuse was often simply dumped on the surface in a deserted area accessible by car or pick-up truck. Refuse can also be associated with a dwelling that may no longer be present. Detecting the kinds of items purchased or owned by a population, and the ways in which these items are obtained, has been termed “consumer studies.” Historical archaeologists have noted the development of a consumer-oriented culture within the United States during the late 19th century due to a general wide availability of consumer goods (Spencer-Wood 1987). This trend has continued into the 20th century and is discernible in both rural and urban contexts, although some researchers have noted different emphases on purchasing behavior (Van Wormer 1991). Cultural items from a recognizable historical context have potential for illuminating behavioral patterns and preferences of a residential population.

Within the survey area, the following data sets are considered relevant to addressing research questions related to historic research issues:

- Presence of sites containing foundations or other indications for the presence of early dwellings, water conveyance, or other structures possibly associated with farming activities.
- Presence of intact trash deposits or dumps that can be associated with specific kinds of occupations, functions, or dwellings.
- Presence of trash deposits or dumps containing diagnostic artifacts that can be accurately associated with particular types of activities or time periods, or with particular group affiliations such as farmers or railroad workers.

The following research questions are applicable:

1. What kinds of materials were disposed of in the trash dumps?
2. What does the documentary record indicate about the dates of occupation?
3. Is the site associated with 20th century agricultural use of the dry lake bed?
4. What can be determined about the socioeconomic unit responsible for the disposal?
5. Does the artifact assemblage reflect the range of artifacts expected to be consumed in a rural household?

6. Do the artifacts identified give any indication of the economic status of the household unit?
7. How do the types and numbers of artifacts compare with other known rural sites in Southern California?
8. Is there evidence of food consumption?
9. Is there evidence of products consumed by specific age, gender, or ethnic groups?
10. What can the archaeological deposits tell us about the daily life of the residents and their choices of available consumer goods?

## **CHAPTER 5**

### **ARCHAEOLOGICAL SURVEY RESULTS**

Between May 19 and May 25, 2014, Project archaeologists conducted a survey of the Project direct effects APE, a roughly 600-acre area encompassing the proposed Project disturbance area for the solar facility site. Two Native American representatives also participated in the survey efforts. Steven Brierty of the San Manuel Band of Mission Indians surveyed alongside Project archaeologists May 19 through May 24, 2014, and Brandi Kendrick of Kern Valley Indian Council participated in the survey between May 19 and May 23, 2014.

As specified in the BLM Manual and in keeping with the Secretary of the Interior's Standards and Guidelines for Historic Preservation, the survey of the direct effects APE was a Class III archaeological survey, defined as an intensive pedestrian survey designed to identify and evaluate all of the cultural resources in the Project area that are "locatable from surface and exposed profile indications" (BLM 2004:19; see methods discussion in Chapter 4). Owing to the general lack of vegetation in the direct effects APE, ground visibility was extremely good, ranging from 90% to 100%. This allowed for a more complete and reliable identification of cultural resources. Within the direct effects APE, qualified survey crews inventoried 33 isolates and 15 archaeological sites. Two previously recorded isolates were not relocated during current survey. Of the 48 resources observed, 47 were newly identified and one was previously recorded. Of the 15 archaeological sites, all are historic in age and consisted of 11 refuse scatters, one historic refuse scatter with a prehistoric isolate, one prospect pit, and two historic roads..

Overviews of the direct effects APE with the locations of sites and isolates plotted on 7.5-minute USGS topographic maps are included in Appendix D. DPR site record forms are provided in Appendix E.

The majority of the cultural resources (sites and isolates) identified in the direct effects APE are historic in age, and consist predominately of metal cans, with smaller quantities of glass bottles and jars, broken ceramics, and sundry metal items. Historical features consist of a possible prospect pit, two historic roads, and debris scatters. Prehistoric cultural material consists mostly of flaked stone debitage, with smaller amounts of flaked stone tools. A summary of the identified archaeological sites is provided in Table 10.

**Table 9. Sites Identified in the Direct Effects APE**

<b>Primary Number</b>	<b>Temporary Number</b>	<b>Time Period</b>	<b>Site Type</b>
<b>Previously Recorded Resources</b>			
P-15-016275		Historic	Refuse Scatter
<b>Newly Recorded Resources</b>			
	CS-S-H-001	Historic	Refuse Scatter
	CS-S-H-002	Historic	Refuse Scatter
	CS-S-H-003	Historic	Refuse Scatter
	CS-S-H-004	Historic	Refuse Scatter
	CS-S-H-005	Historic	Refuse Scatter
	CS-S-H-006	Historic	Refuse Scatter
	CS-S-H-008	Historic	Refuse Scatter
	CS-S-H-020	Historic	Refuse Scatter and Prehistoric Isolate
	CS-S-H-021	Historic	Refuse Scatter
	CS-S-H-022	Historic	Refuse Scatter
	CS-S-H-023	Historic	Prospect Pit
	CS-S-H-024	Historic	Refuse Scatter
	CS-S-H-027	Historic	Road
	CS-S-H-028	Historic	Road

**PREVIOUSLY RECORDED SITES**

A single historic site (P-15-016275) and two prehistoric isolates (P-15-016273, P-15-016274) were previously recorded within the direct effects APE. P-15-016273 and P-016274 were not observed during the current survey; however, P-15-016275 was relocated and is discussed in length below.

***P-15-016275***

Site P-15-016275 consists of an extensive and widely dispersed scatter of historic-era refuse within a 260- by 45-meter area bisected by Phillips Road. The resource is located along the eastern margin of the broad foothill bajada that gradually slopes to the east from the eastern base of Barren Ridge. The site and surrounding area contain, principally, the creosote scrub vegetation community, with mostly brittle bush and creosote bush present, but with a few cholla and Joshua trees also present in the vicinity. As originally recorded, the site consisted of a small can dump concentration located along the north side of Phillips Road just east of Highway 14. This dump was relocated during the current survey and is still in essentially the same condition as originally recorded. In the current survey, this original area of the site is designated as Locus A and was seen to contain three concentrations: one larger and two smaller. The larger concentration, labeled Concentration 2, is likely the concentration noted in the original recording. It consists, principally, of 100+ large cans that appear to have been used for potting plants, as they all have square-punched holes around the base for drainage purposes, with a number of them having also been split down the sides to effect intact plant and root-ball removal. The other two smaller

concentrations, labeled Concentrations 1 and 3, consist mostly of other types of cans, including a few older hole-in-top cans. The most common cans in the other two concentrations are church-key-opened beverage cans and sanitary food container cans. The few hole-in-top cans likely date to the early 20th century, and the planter cans and most of the other cans appear to date to the mid-20th century or later. It seems probable that the few hole-in-top cans washed into the location prior to the subsequent, more substantial, episode of dumping, and, therefore, are not related to it.

During the current survey, the site was expanded to include an extensive scatter of historic refuse materials along the south side of Phillips Road. This area was designated as Locus B. Locus B contained a few indistinct concentrations and a much more diverse content of refuse types, including numerous can types such as cone-topped cans, circular and rectangular pocket tobacco cans, church-key-opened and pull-tab beverage cans, meat tins, key-opened sardine cans, salmon cans, ham cans, and large and small sanitary food cans. It also contained crockery fragments, milk bottle fragments, miscellaneous broken pieces of metal and wire, and some construction debris (cement chunks, tiles). Most of the cans and other materials in this locus appear to date to the mid-20th century or later. As in Locus A, a few hole-in-top and/or solder-dot cans were also observed in the Locus B area, but, as was the case in Locus A, it appears likely that they washed into the location well-prior to the subsequent, more substantial episode of dumping, and, therefore, are not related to it. Also observed in the Locus B area was a large, square-based earthen pyramid of unknown, but recent, origin. Portions of the Locus B area also displayed evidence of grading (parallel ridges on the ground surface) of unknown age or purpose.

The refuse materials contained within both loci appear to date mostly to the mid-20th century, mostly from the 1950s and 1960s, with a few older (early 20th century) and some more recent (modern) materials mixed in. The condition of the deposit ranges from fair to poor. Some of the artifacts within the site area appear to have been dispersed by alluvial and/or aeolian erosional actions and by human activities such as grading and target practice, resulting in poor integrity and context for these materials. Overall, the resource's integrity is marginal, and its potential data content is limited, as the site appears to represent transitory dumping activities with no contextual evidence for origin or association.

Site P-15-016275 is, therefore, recommended not eligible for the NRHP under all Criteria (A–D). This site is not associated with events or persons important to the past and is recommended not eligible for the NRHP under Criterion A or B. The site does not represent a distinct style, type, or design and is recommended not eligible for inclusion to the NRHP under Criterion C. No evidence was observed for it to contain any new, unique, or other important historical information. Based on a low potential to contribute to regional research and poor integrity, site P-15-016275 is, therefore, recommended not eligible for the NRHP under Criterion D

## **NEWLY RECORDED SITES**

### ***CS-S-H-001***

Site CS-S-H-001 consists of a widely dispersed scatter of historic-era refuse within a 50-meter by 15-meter area. The resource is located on a broad foothill bajada that gradually slopes to the east from the eastern base of Barren Ridge. The site and surrounding area contain a creosote

scrub vegetation community with brittle bush and creosote bush present. The scatter contains six cans: three hole-in-top cans, two paint cans, and one beverage can. The principal opening method observed was knife-opening. The artifacts appear to have been dispersed by alluvial and/or aeolian erosion actions, target practice, and dirt road grading, indicating poor integrity and lack of context for these materials.

Site CS-S-H-001 is recommended not eligible for the NRHP under all Criteria (A–D). This site is not associated with events or persons important to the past and is recommended not eligible for the NRHP under Criterion A or B. The site does not represent a distinct style, type, or design, and is recommended not eligible for inclusion to the NRHP under Criterion C. Although the materials contained within the refuse scatter appear to date mostly to the early 20th century, the condition of the deposit is poor, as it appears likely that the materials were redeposited by erosional processes from an upslope source not within the current Project site. The resource's integrity is poor, and its potential data content is limited. Consequently, this site does not have the potential to yield information important to history and is recommended not eligible for the NRHP under Criterion D.

### ***CS-S-H-002***

Site CS-S-H-002 consists of a widely dispersed scatter of historic-era refuse within a 10-meter by 7-meter area. The resource is located on a broad foothill bajada that gradually slopes to the east from the eastern base of Barren Ridge. The site and surrounding area contain creosote scrub vegetation community, with brittle bush, rabbitbrush, and creosote bush present. The scatter contains one hole-in-cap can, one paint can, and one beverage can. The hole-in-cap can had been punched open with a knife, the paint can opened via a rotary can opener, and the beverage can opened with a church-key. The artifacts appear to have been dispersed by alluvial and/or aeolian erosion actions, with two of the cans along the margin of a small ephemeral wash, indicating poor integrity and lack of context for these materials.

Site CS-S-H-002 is recommended not eligible for the NRHP under all Criteria (A–D). This site is not associated with events or persons important to the past and is recommended not eligible for the NRHP under Criterion A or B. The site does not represent a distinct style, type, or design, and is recommended not eligible for inclusion to the NRHP under Criterion C. Although the materials contained within the refuse scatter may date from the early to mid-20th century, the condition of the deposit is poor, as it appears likely that the materials were redeposited by erosional processes from an upslope source such as refuse discarded along an old roadway within the Project area, such as Keeler Road, or from other upslope sources not within the current Project area. The resource's integrity is poor, and its potential data content is limited. Consequently, this site does not have the potential to yield information important to history, and is recommended not eligible for the NRHP under Criterion D.

### ***CS-S-H-003***

Site CS-S-H-003 consists of a dispersed scatter of historic-era refuse within a 45-meter by 30-meter area. The resource is located on a broad foothill bajada that gradually slopes to the east from the eastern base of Barren Ridge. The site and surrounding area contain a creosote scrub vegetation community, with brittle bush, rabbitbrush, and creosote bush present. The refuse scatter includes two hole-in-top cans, one hole-in-cap can, and seven aqua glass insulator

fragments. One of the hole-in-top cans and the hole-in-cap can were both opened with knife cuts, and the second hole-in-top can was opened with a knife punch. The insulator appears likely to have been shattered by gun fire. The artifacts appear to have been dispersed by alluvial and/or aeolian erosion actions, with two of the cans found along the margin of a small ephemeral wash, indicating poor integrity and lack of context for these materials.

Site CS-S-H-003 is recommended not eligible for the NRHP under all Criteria (A–D). This site is not associated with events or persons important to the past and is recommended not eligible for the NRHP under Criterion A or B. The site does not represent a distinct style, type, or design and is recommended not eligible for inclusion to the NRHP under Criterion C. Although the materials contained within the refuse scatter appear to date mostly to the early 20th century, the condition of the deposit is poor, as it appears likely that the materials were redeposited by erosional processes from an upslope source, such as refuse discarded along on old roadway within the Project area, such as Keeler Road, or from other upslope sources not within the current Project area. The resource’s integrity is poor, and its potential data content is limited. Consequently, this site does not have the potential to yield information important to history, and is recommended not eligible for the NRHP under Criterion D.

#### ***CS-S-H-004***

Site CS-S-H-004 consists of a dispersed scatter of historic-era refuse within a 55-meter by 30-meter area. The resource is located on a broad foothill bajada that gradually slopes to the east from the eastern base of Barren Ridge. The site and surrounding area contain creosote scrub vegetation community, with brittle bush, rabbitbrush, cholla, and creosote bush present. The refuse scatter consists of one interior friction-lid can with original wire handle; one hole-in-cap can; and six fragments of sun-colored amethyst glass, including a bottle finish and base. No embossed markings were noted on the bottle base. The hole-in-cap can was opened with two knife cuts. The artifacts appear to have been dispersed by alluvial and/or aeolian erosion actions, suggesting poor integrity and lack of context for these materials.

Site CS-S-H-003 is recommended not eligible for the NRHP under all Criteria (A–D). This site is not associated with events or persons important to the past and is recommended not eligible for the NRHP under Criterion A or B. The site does not represent a distinct style, type, or design and is recommended not eligible for inclusion to the NRHP under Criterion C. Although the materials contained within the refuse scatter appear to date mostly to the early 20th century, the condition of the deposit is poor, as it appears likely that the materials were redeposited by erosional processes from an upslope source such as refuse discarded along on old roadway within the Project area, such as Keeler Road, or from other upslope sources not within the current Project area. The resource’s integrity is poor, and its potential data content is limited. Consequently, this site does not have the potential to yield information important to history and is recommended not eligible for the NRHP under Criterion D.

#### ***CS-S-H-005***

Site CS-S-H-005 consists of a dispersed scatter of historic-era refuse within a 15-meter by 5-meter area. The resource is located on a broad foothill bajada that gradually slopes to the east from the eastern base of Barren Ridge. The site and surrounding area contain creosote scrub vegetation community, with brittle bush, rabbitbrush, and creosote bush present. The refuse

scatter includes three hole-in-top cans, two of which appear to be condensed milk cans. The hole-in-cap cans were opened with two knife cuts. The artifacts appear to have been dispersed by alluvial and/or aeolian erosion actions, with two of the cans located within a small ephemeral wash, suggesting poor integrity and lack of context for these materials.

Site CS-S-H-005 is recommended not eligible for the NRHP under all Criteria (A–D). This site is not associated with events or persons important to the past and is recommended not eligible for the NRHP under Criterion A or B. The site does not represent a distinct style, type, or design and is recommended not eligible for inclusion to the NRHP under Criterion C. Although the materials contained within the refuse scatter appear to date mostly to the early 20th century, the condition of the deposit is poor, as it appears likely that the materials were redeposited by erosional processes from an upslope source, such as refuse discarded along on old roadway, such as Keeler Road, within the Project area, or from other upslope sources not within the current Project area. The resource’s integrity is poor, and its potential data content is limited. Consequently, this site does not have the potential to yield information important to history and is recommended not eligible for the NRHP under Criterion D.

#### ***CS-S-H-006***

Site CS-S-H-006 consists of a dispersed scatter of historic-era refuse within a 35-meter by 15-meter area. The resource is located on a broad foothill bajada that gradually slopes to the east from the eastern base of Barren Ridge. The site and surrounding area contain creosote scrub vegetation community with brittle bush, rabbitbrush, and creosote bush present. The refuse scatter includes three hole-in-top cans, all opened with knife cuts. The artifacts appear to have been dispersed by alluvial and/or aeolian erosion actions, all located within a small ephemeral wash, suggesting poor integrity and lack of context for these materials.

Site CS-S-H-006 is recommended not eligible for the NRHP under all Criteria (A–D). This site is not associated with events or persons important to the past and is recommended not eligible for the NRHP under Criterion A or B. The site does not represent a distinct style, type, or design and is recommended not eligible for inclusion to the NRHP under Criterion C. Although the materials contained within the refuse scatter appear to date mostly to the early 20th century, the condition of the deposit is poor, as it appears likely that the materials were redeposited by erosional processes from an upslope source such as refuse discarded along on old roadway, such as Keeler Road, within the Project area, or from other upslope sources not within the current Project area. The resource’s integrity is poor, and its potential data content is limited. Consequently, this site does not have the potential to yield information important to history and is recommended not eligible for the NRHP under Criterion D.

#### ***CS-S-H-008***

Site CS-S-H-008 consists of a dispersed scatter of historic-era refuse within a 30-meter by 30-meter area. The resource is located on a broad foothill bajada that gradually slopes to the east from the eastern base of Barren Ridge. The site and surrounding area contain creosote scrub vegetation community, with brittle bush, rabbitbrush, and creosote bush present. The refuse scatter includes eight metal cans: three hole-in-cap cans, three sanitary cans, and two solder dot cans. The three hole-in-cap cans, the two solder-dot cans, and one of the sanitary cans were opened with knife cuts. One of the remaining sanitary cans was opened with a rotary opener and

the other sanitary can was crushed with no opening method discernible. The artifacts appear dispersed by alluvial and/or aeolian erosion actions, with some also used for target practice likely resulting in further dispersal, suggesting poor integrity and context for these materials.

Site CS-S-H-008 is recommended not eligible for the NRHP under all Criteria (A–D). This site is not associated with events or persons important to the past and is recommended not eligible for the NRHP under Criterion A or B. The site does not represent a distinct style, type, or design and is recommended not eligible for inclusion to the NRHP under Criterion C. Although the materials contained within the refuse scatter appear to date mostly to the early 20th century, the condition of the deposit is poor, as it appears likely that the materials were redeposited by erosional processes from an upslope source not within the current Project area. The resource’s integrity is poor, and its potential data content is limited. Consequently, this site does not have the potential to yield information important to history, and is recommended not eligible for the NRHP under Criterion D.

#### ***CS-S-H-020***

Site CS-S-H-020 consists of a dispersed scatter of historic-era refuse within a 60-meter by 30-meter area. The resource is located on a broad foothill bajada that gradually slopes to the east from the eastern base of Barren Ridge. The site and surrounding area contain creosote scrub vegetation community, with brittle bush, rabbitbrush, and creosote bush present. The resource consists of a dispersed can scatter that includes five sanitary food cans and three hole-in-cap cans, two aqua glass bottle bases, two sun-colored amethyst glass fragments, two metal spoons, and approximately 20+ fragments of aqua-colored glass. A single CCS secondary flake was also observed within a refuse scatter area. The artifacts appear dispersed by alluvial and/or aeolian erosion processes, with some also used for target practice, likely resulting in further dispersal and suggesting poor integrity and context for these materials.

Site CS-S-H-020 is recommended not eligible for the NRHP under all Criteria (A–D). This site is not associated with events or persons important to the past and is recommended not eligible for the NRHP under Criterion A or B. The site does not represent a distinct style, type, or design and is recommended not eligible for inclusion to the NRHP under Criterion C. Although the historic materials contained within the refuse scatter appear to mostly date to the early 20th century, the condition of the deposit is poor, as it appears likely that the materials have been disbursed by erosional processes. The single CCS flake appears to be the coincidental occurrence of an isolated prehistoric artifact in the same area as the refuse scatter. The resource’s integrity is poor, and its potential data content is limited. Consequently, this site does not have the potential to yield information important to history and is recommended not eligible for the NRHP under Criterion D.

#### ***CS-S-H-021***

Site CS-S-H-021 consists of a dispersed, historic-era metal can scatter within a 30-meter by 25-meter area. The resource is located on a broad foothill bajada that gradually slopes to the east from the eastern base of Barren Ridge. The site and surrounding area contain creosote scrub vegetation community, with brittle bush, rabbitbrush, and creosote bush present. The can scatter includes approximately 40+ sanitary beverage cans, some of which still contain discernible Lucky Lager or Eastside Beer labels. All are church-key opened. The artifacts appear dispersed

by alluvial and/or aeolian erosion actions, as well as the apparent use of several for target practice, resulting in further dispersal.

Site CS-S-H-021 may represent an episode of minimal refuse dumping or, perhaps, the location of a single episode of congenial beer consumption, and is recommended not eligible for the NRHP under all Criteria (A–D). This site is not associated with events or persons important to the past and is recommended not eligible for the NRHP under Criterion A or B. The site does not represent a distinct style, type, or design and is recommended not eligible for inclusion to the NRHP under Criterion C. The historic materials contained within the refuse scatter appear to mostly date to the mid-20th century, circa the 1950s and early 1960s; however, the resource's integrity is poor and its potential data content is limited. Consequently, this site does not have the potential to yield information important to history, and is recommended not eligible for the NRHP under Criterion D.

### ***CS-S-H-022***

Site CS-S-H-022 consists of a circular wooden and plaster/cement feature and a possibly associated, dispersed scatter of historic refuse and debris within an area measuring 40 by 23 meters. The resource is located on the broad foothill bajada that gradually slopes to the east from the eastern base of Barren Ridge. The site and surrounding area contain creosote scrub vegetation community, with brittle bush and creosote bush present. The condition of the feature is poor and its function is indeterminate. The historic refuse and debris includes approximately five amethyst glass pieces, four 20-inch-diameter metal barrel loops, seven pieces of window glass, one 12-inch-diameter bucket lid, and an approximately 4-inch-diameter by 22 inches long stove pipe fragment with damper. The artifacts appear dispersed by alluvial and/or aeolian erosion actions, suggesting poor integrity and context for these materials. The site appears to be in fair condition, with some disturbances from alluvial and/or aeolian erosional activities as well as some off-road-vehicle (ORV) activity.

Site CS-S-H-022 is recommended not eligible for the NRHP under all Criteria (A–D). This site is not associated with events or persons important to the past and is recommended not eligible for the NRHP under Criterion A or B. The site does not represent a distinct style, type, or design and is recommended not eligible for inclusion to the NRHP under Criterion C. The refuse may represent episodic of minimal refuse dumping that has been subsequently dispersed by alluvial and/or aeolian erosional and by recent ORV actions. The function and age of the feature remain indeterminate. Although some of the historic materials within the refuse scatter appear to date to the early 20th century, others may be more recent. The condition of the feature and the deposit is poor, as it appears likely that the materials have been disbursed by erosional processes. The resource's integrity is poor, and its potential data content is limited. Consequently, this site does not have the potential to yield information important to history and is recommended not eligible for the NRHP under Criterion D.

### ***CS-S-H-023***

Site CS-S-H-023 consists of a possible prospect pit excavated for mining exploration purposes, measuring 6 meters by 6 meters with a depth of 0.8 meters. The site and surrounding area contain creosote scrub vegetation community, with brittle bush, rabbitbrush, and creosote bush present. No artifacts were observed around the pit feature, but it appeared to be eroded by

alluvial and/or aeolian erosion actions, suggesting some antiquity.

Site CS-S-H-023 is recommended not eligible for the NRHP under all Criteria (A–D). This site is not associated with events or persons important to the past and is recommended not eligible for the NRHP under Criterion A or B. The site does not represent a distinct style, type, or design and is recommended not eligible for inclusion to the NRHP under Criterion C. The resource may represent an isolated episode of mining prospecting, subsequently eroded by alluvial or aeolian erosional actions. The age and a definite origin of this feature are indeterminate. The resource’s data content is limited and integrity is compromised. As such, this site does not have the potential to yield information important to history; it is recommended not eligible for the NRHP under Criterion D.

#### ***CS-S-H-024***

Site CS-S-H-024 consists of a glass/can scatter within a 26-meter by 15-meter area. The resource is located on a broad foothill bajada that gradually slopes to the east from the eastern base of Barren Ridge. The site and surrounding area contain a creosote scrub vegetation community with brittle bush, rabbitbrush, and creosote bush present. The resource consists of a refuse scatter that includes eight glass bottle finishes (one amethyst, five clear, and two aqua), three clear glass bottle bases, three amethyst glass fragments, one amethyst bottle base fragment, three clear glass fragments of a milk bottle, two “Pepsi Cola” bottles (one embossed and one lithographed), one “Squirt” bottle, aqua glass fragments, a circular metal strap, and one hole-in-cap can fragment. The site retains fair integrity, but the materials may have been somewhat dispersed by alluvial and/or aeolian erosion actions and by target practice.

Site CS-S-H-024 is recommended not eligible for the NRHP under all Criteria (A–D). This site is not associated with events or persons important to the past and is recommended not eligible for the NRHP under Criterion A or B. The site does not represent a distinct style, type, or design and is recommended not eligible for inclusion to the NRHP under Criterion C. The resource may represent episodes of minimal refuse dumping, as the historic materials contained within the refuse scatter appear to date from the early to mid-20th century. However, the resource’s integrity is only fair to poor and its potential data content is limited. Consequently, this site does not have the potential to yield information important to history and is recommended not eligible for the NRHP under Criterion D.

#### ***CS-S-H-027 (Keeler Road)***

CS-S-H-027 is the northeast/southwest-trending historic Keeler Road. It is 8 to 10 feet wide and has been graded. The road is currently marked as BLM Road MK52, and it is regularly used, although it is unclear whether or not it is regularly maintained. The segment within the Project area is approximately 1 mile long. Amethyst-colored glass scatters and early to mid-20th century refuse were noted in the vicinity of Keeler Road. However, these historic items have been displaced by erosional processes and cannot assuredly be connected to the road. There were, therefore, recorded as isolated finds (CS-ISO-H-003, -004, -011, -016, and -044).

Figure 7 shows CS-S-H-027 and CS-S-H-028 (described below) from 1915 to 1953. As shown in the 1915 map, Keeler Road is the most direct route between the towns of Mojave and Cinco. Keeler is also present on the 1943 map, but it appears that U.S Route-6 (currently known as State

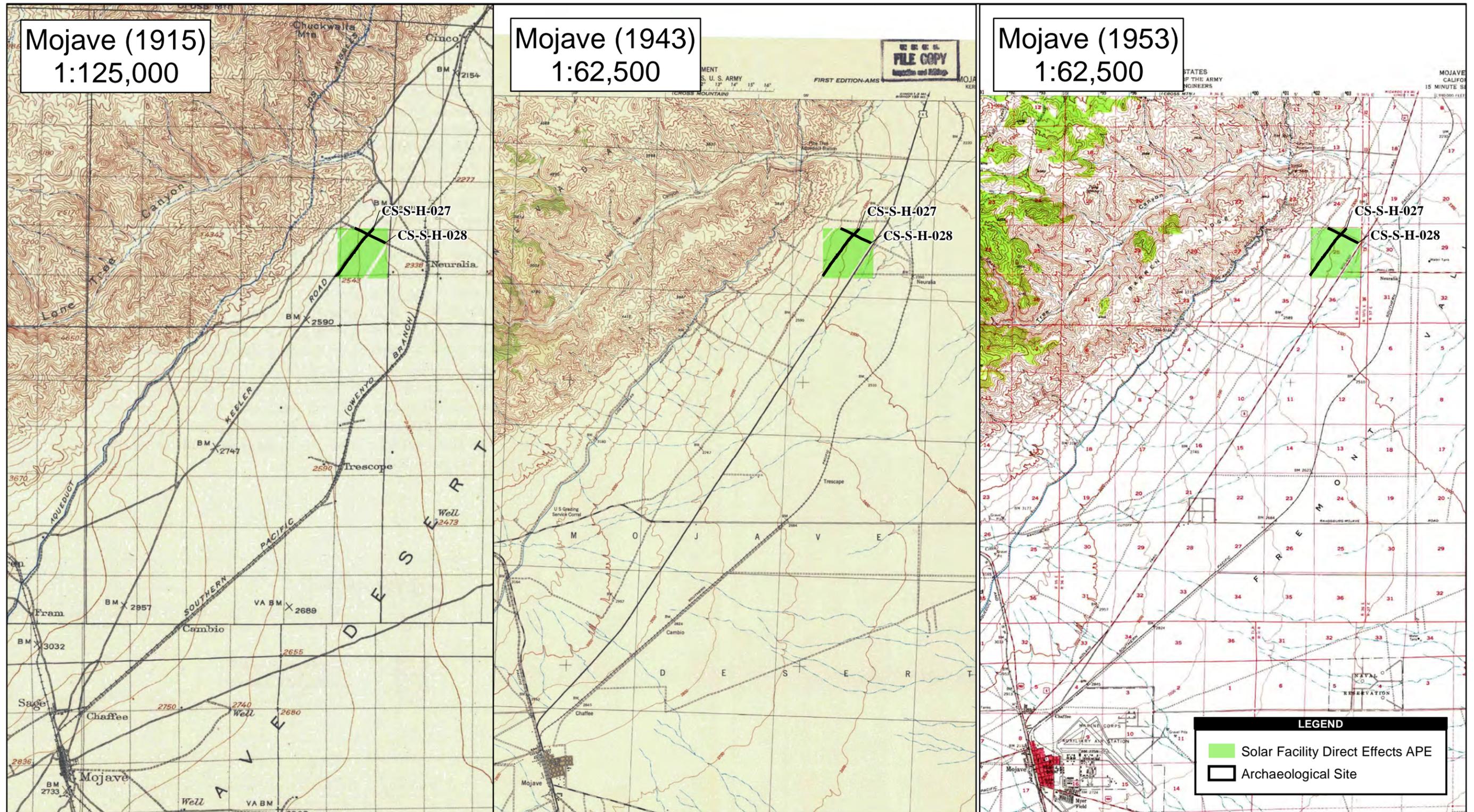
Route (SR) 14) replaced Keeler Road as the main route between Mojave and Cinco. As of 1943, Keeler Road no longer connected Cinco with Mojave, terminating at its intersection with U.S. Route-6 just south of Cinco, and transitioning into the east/west and north/south portions of U.S. Route-466, just north of Mojave. Furthermore, Keeler Road is not present on later maps, indicating that by the 1950s, it was no longer a primary route for transportation.

Site CS-S-H-027 was an early 20th century transportation route between the towns of Mojave and Cinco; it is currently being used, and perhaps regularly maintained, by BLM. No diagnostic artifacts within the Project area can be definitively linked to the segment. As such, site CS-S-H-027 is recommended not eligible for inclusion to the NRHP under all Criteria (A–D). The site does not contribute to the broad patterns of history, so it is recommended not eligible for inclusion to the NRHP under Criterion A. The site does not relate to persons important to the past and is recommended not eligible under Criterion B. The site does not represent a unique style, type, or design, and it does not represent the work of a master, and is recommended not eligible under Criterion C. Although the route may represent important information about transportation in the area, the segment that crosses the Project area lacks historic integrity and does not have the potential to provide additional information important to history beyond what has been recorded here; it is recommended not eligible for inclusion to the NRHP under Criterion D.

#### ***CS-S-H-028***

CS-S-H-028 is a graded northwest/southeast-trending historic dirt road that extends from the Southern Pacific Railroad Railway at Neuralia into the Sierra Mountain Range. CS-S-H-028 appears on the 1915, 1953, and 1973 historic maps (Figure 7). Although it is not present on the 1943 map, the route appears to be the same from 1915 to the present. Currently, the road is marked as BLM Road MKX50 and it is being used as a primary access road from SR-14 to the LAWDP transmission line corridor and the Los Angeles Aqueduct. It is approximately 20 feet wide and is regularly graded and maintained. The segment within the Project area is 0.7 mile long. No historic artifacts were observed to be directly associated with the road, although a newly recorded refuse scatter (CS-S-H-024) is located nearby.

Site CS-S-H-028 was an early 20th century transportation route connecting the railway line and the historic Los Angeles Aqueduct (CA-KER-3549H); it is currently being used and regularly maintained by BLM. No diagnostic artifacts within the Project area can be definitively linked to the segment. As such, site CS-S-H-027 is recommended not eligible for inclusion to the NRHP under all Criteria (A–D). The site does not contribute to the broad patterns of history, so it is recommended not eligible for inclusion to the NRHP under Criterion A. The site does not relate to persons important to the past and is recommended not eligible under Criterion B. The site does not represent a unique style, type, or design, and it does not represent the work of a master, and is recommended not eligible under Criterion C. Although the route may represent important information about the construction of the historically significant Los Angeles Aqueduct, the segment that crosses the Project area lacks historic integrity and does not have the to provide additional information important to history beyond what has been recorded here; it is recommended not eligible for inclusion to the NRHP under Criterion D.



Source: RE Astoria, LLC; NETRonline



Figure 7  
Historic Roads



## Isolated Finds

Table 11 lists the 33 isolated finds identified in the Project area. Isolates were defined as fewer than three artifacts in a 30-square-meter area. As noted above, several of these historic items, particularly those in proximity to the down-slope side of the Project site, may be indirectly associated with site CS-S-H-027 (Keeler Road), but, because they have been displaced by erosional processes, they cannot be definitively associated with it. None of the isolates identified during the intensive pedestrian survey are recommended eligible for inclusion to the NRHP.

**Table 10. Isolates Recorded in the Direct Effects APE**

Isolate Number	Temporary Number	Time Period	Description
<b>Previously Recorded Isolates</b>			
P-15-016273		Prehistoric	1 CCS flake; could not relocate
P-15-016274		Prehistoric	1 quartzite flake; could not relocate
<b>Newly Recorded Isolates</b>			
	C-ISO-P-001	Prehistoric	1 white CCS flakes
	C-ISO-H-002	Historic	1 hole-in-cap can
	C-ISO-H-003	Historic	1 hole-in-top can
	C-ISO-H-004	Historic	Amethyst glass scatter
	C-ISO-P-005	Prehistoric	1 secondary CCS flake
	C-ISO-H-006	Historic	1 hole-in-cap can
	C-ISO-P-007	Prehistoric	1 tertiary CCS flake
	C-ISO-H-008	Historic	1 paint can
	C-ISO-H-009	Historic	1 tobacco can
	C-ISO-H-010	Historic	1 hole-in-top can
	C-ISO-H-011	Historic	1 amethyst glass shard
	C-ISO-P-012	Prehistoric	1 secondary CCS flake
	C-ISO-H-013	Historic	1 tobacco can
	C-ISO-H-014	Historic	1 sardine can
	C-ISO-H-015	Historic	1 sardine can
	C-ISO-H-016	Historic	Amethyst glass scatter
	C-ISO-H-017	Historic	1 tobacco can
	C-ISO-H-018	Historic	1 hole-in-cap can, 1 sanitary can
	C-ISO-H-019	Historic	Aqua insulator glass scatter
	C-ISO-H-042	Historic	1 aqua glass scatter, 1 key-strip-opened can
	C-ISO-H-043	Historic	Aqua insulator glass scatter
	C-ISO-H-044	Historic	Amethyst glass scatter
	C-ISO-P-045	Prehistoric	1 CCS biface fragment
	C-ISO-H-046	Historic	1 oil can with top
	C-ISO-H-047	Historic	Glass scatter
	C-ISO-H-048	Historic	1 oil can with top
	C-ISO-H-049	Historic	Amethyst glass scatter
	C-ISO-H-050	Historic	1 oil can with top
	C-ISO-H-051	Historic	Clear and aqua insulator glass scatter
	C-ISO-H-052	Historic	1 square meat tin

<b>Isolate Number</b>	<b>Temporary Number</b>	<b>Time Period</b>	<b>Description</b>
	C-ISO-H-053	Historic	1 5-gallon trash can
	C-ISO-H-054	Historic	1 tobacco can
	C-ISO-H-057	Historic	1 pole and glass scatter

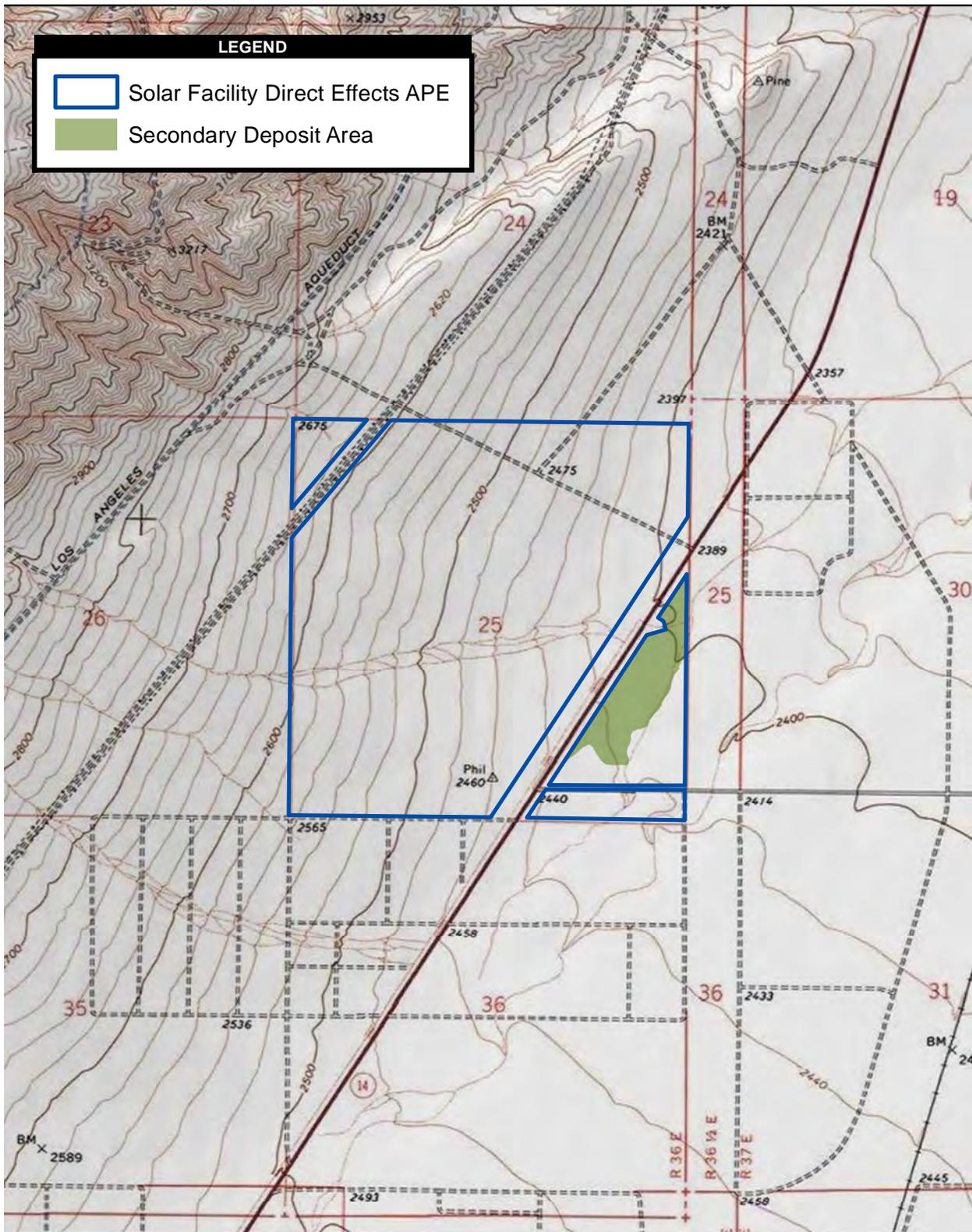
CCS = cryptocrystalline

## Secondary Deposits

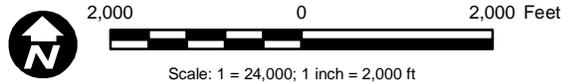
Secondary deposits consisting of a sparse scatter of mostly non-diagnostic tin cans were noted throughout the Project area, but with a slightly greater frequency in the southeastern corner of the direct effects APE east of SR-14 (Figure 8). Due to their broad distribution and lack of integrity (intact context), these secondary deposits were not formally recorded, but only noted. Unsurprisingly, secondary deposits were primarily found in or near ephemeral washes or deeper drainages across the Project area; they consisted of non-diagnostic tin cans (Plate 1). It is likely that these resources were redeposited from multiple sources over time by aeolian and alluvial actions emanating from the Sierra Nevada Mountains to the immediate west.



**Plate 1. A Secondary Deposit in the Project Area**



Source: AECOM 2014; Copyright:© 2013 National Geographic Society, i-cubed; 7.5' Topographic Quadrangle Mojave NE 1994



**Figure 8**  
**Secondary Deposit in**  
**Southeast Corner of Direct Effects APE**

## **Built Environment Resources**

Prior to fieldwork, available historic maps were reviewed to identify potential historic architecture resources within the indirect effects APE. No historic architecture resources were identified on any historic maps. Based on these results, review of historic topographic maps, and results of the SSJVIC records search, a reconnaissance survey was not conducted for resources within the indirect effects APE.

## **CHAPTER 6**

### **SUMMARY AND MANAGEMENT RECOMMENDATIONS**

#### **SUMMARY**

From May 19 to May 25, 2014, AECOM cultural resources specialists conducted a Class III archaeological survey for the Project. Native American representatives participated in survey efforts between May 19 and May 24, 2014. As defined in Section 8110 of the BLM Manual, a Class III survey is a “professionally conducted, thorough pedestrian survey of an entire target area” intended to “provide managers and cultural resource specialists with a complete record of cultural properties locatable from surface and exposed profile indications” (BLM 2004:19). For the Project, the “target area” was defined as the direct effects APE, which consisted of the disturbance area for the proposed solar facility site.

The intensive pedestrian survey of the direct effects APE inventoried 15 archaeological sites, of which all are historic in age. One of the sites was recorded previously. The survey also identified 33 isolated finds, 28 of which are historic and five are prehistoric.

In the direct effects APE, sites and isolated finds include prehistoric and historical artifacts and features. The majority of the cultural resources (sites and isolates) identified in the Project area are historic and consist predominately of metal cans, with smaller quantities of glass bottles and jars, broken ceramics, and sundry metal items. Historical features include a possible prospecting pit, debris scatters from the early to mid-20th century, and two historic roads. Prehistoric cultural material includes mostly flaked stone debitage, with smaller amounts of flaked stone tools.

Survey fieldwork in the direct effects APE was guided by a records and archival research program conducted at the SSJVIC. In the course of that archival research, Project specialists collected information pertinent to the environment, history, and prehistory of the region generally, and the Fremont Valley, specifically. The substance of that research informs the interpretations of Project cultural resources, and is presented in Chapters 2 and 3.

Based on background research and surface observations, none of the archaeological sites that may be impacted by construction of the Project constitute historic properties eligible for the NRHP (Table 12).

**Table 11. NRHP Eligibility Status for Sites in the Direct Effects APE**

<b>Primary Number</b>	<b>Temporary Number</b>	<b>Time Period</b>	<b>Site Type</b>	<b>Eligibility Recommendation</b>	<b>Criteria</b>
<b>Previously Recorded Resources</b>					
P-15-016275		Historic	Refuse Scatter	Not Eligible	A–D
<b>Newly Recorded Resources</b>					
	CS-S-H-001	Historic	Refuse Scatter	Not Eligible	A–D
	CS-S-H-002	Historic	Refuse Scatter	Not Eligible	A–D
	CS-S-H-003	Historic	Refuse Scatter	Not Eligible	A–D
	CS-S-H-004	Historic	Refuse Scatter	Not Eligible	A–D
	CS-S-H-005	Historic	Refuse Scatter	Not Eligible	A–D
	CS-S-H-006	Historic	Refuse Scatter	Not Eligible	A–D
	CS-S-H-008	Historic	Refuse Scatter	Not Eligible	A–D
			Refuse Scatter; Prehistoric		
	CS-S-H-020	Historic	Isolate	Not Eligible	A–D
	CS-S-H-021	Historic	Refuse Scatter	Not Eligible	A–D
	CS-S-H-022	Historic	Refuse Scatter	Not Eligible	A–D
	CS-S-H-023	Historic	Prospect Pit	Not Eligible	A–D
	CS-S-H-024	Historic	Refuse Scatter	Not Eligible	A–D
	CS-S-H-027	Historic	Road	Not Eligible	A–D
	CS-S-H-028	Historic	Road	Not Eligible	A–D

## RECOMMENDATIONS

The results of the field survey and research indicate that the Project does not contain resources eligible for the NRHP and, as such, the Project will not have an effect on any historic properties. No further treatment is required.

In the event that any unanticipated buried cultural deposits are encountered during Project construction, all construction work in the vicinity of the deposit will cease and, as a standard procedure, a qualified archaeologist will be consulted. The qualified archaeologist will coordinate with the Project owner’s construction manager and environmental compliance manager, and assess the buried cultural deposits. If the discovery is determined to be not significant, work will be allowed to continue.

If a discovery is determined to be significant, a mitigation plan should be prepared and carried out in accordance with federal guidelines. Implementation of the mitigation plan should include Native American participation. If the resources cannot be avoided, a data recovery plan should be developed to ensure collection of sufficient information to address archaeological and historical research questions, with results presented in a technical report describing field methods, materials collected, and conclusions. Any cultural material collected as part of an assessment or data recovery effort should be curated at a qualified facility. Field notes and other pertinent materials should be curated along with the archaeological collection.

If human remains are discovered during any construction activities, all ground-disturbing activity within 50 feet of the remains will be halted immediately, and the county coroner will be notified

immediately, according to Section 5097.98 of the State Public Resources Code and Section 7050.5 of California's Health and Safety Code. The NAHC will be notified within 24 hours and will identify a Most Likely Descendant, who will be designated to cooperate with the owner of the land on which the remains were discovered to arrange for the proper disposition of the remains, according to the NAHC guidelines for the treatment and disposition of human remains.

Should the Project change to incorporate new areas of proposed disturbance, intensive pedestrian archaeological survey and reconnaissance architectural survey of these areas will be required.



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# **APPENDIX A**

## **RESUMES**



**APPENDIX B**

**RECORDS SEARCH RESULTS**

*(CONFIDENTIAL – Separately Bound)*



## **APPENDIX C**

### **NATIVE AMERICAN CONTACT PROGRAM**



**APPENDIX D**

**SURVEY RESULTS**

*(CONFIDENTIAL – Separately Bound)*



**APPENDIX E**

**DPR FORMS**

*(CONFIDENTIAL – Separately Bound)*

