CULTURAL RESOURCES

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SUMMARY OF CONCLUSIONS

U.S. Bureau of Land Management (BLM) and Energy Commission staff (hereinafter jointly referred to as "staff") conclude that the ISEGS project would have no significant direct or indirect impacts on known, NRHP- or CRHR-eligible archaeological, ethnographic, or built-environment resources. Staff also concludes that the implementation of proposed Conditions of Certification **CUL-1** through **CUL-7** and **CUL-10** would reduce to less than significant, direct or indirect impacts to any such resources that are found during the course of the construction, operation, maintenance, closure, or decommissioning of the project. Staff further concludes that without mitigation, the effect of the Ivanpah Solar Energy Generating System (ISEGS) project on the Hoover Dam-to-San Bernardino transmission line, a historically significant built-environment resource, would be cumulatively considerable and would contribute to a significant cumulative effect on the environment. The adoption and implementation of Conditions of Certification **CUL-8** and **CUL-9** (mitigation measures) would render the potential effect of the proposed project on the resource less than cumulatively considerable.

Conditions of Certification **CUL-1** through **CUL-7** and **CUL-10** take into account the extensive and thorough field investigations that Bright Source (applicant) undertook for the present analysis and underwrites the recommendation of staff that the applicant be given substantial relief from routine monitoring requirements. The adoption and implementation of Conditions of Certification **CUL-1** through **CUL-7** and **CUL-10** ensure that the applicant would be able to respond quickly and effectively to what staff concludes is the highly improbable event that archaeological sites are found on the surface of the project area or buried beneath it during construction-related ground disturbance. Conditions of Certification referred to herein serve the purpose of both the Energy Commission's Conditions of Certification for purposes of the California Environmental Quality Act (CEQA) and BLM's Mitigation Measures for purposes of the National Environmental Policy Act (NEPA).

INTRODUCTION

This cultural resources assessment identifies the potential impacts of the ISEGS project on cultural resources. Cultural resources are defined under state law as buildings, sites, structures, objects, and historic districts. Three kinds of cultural resources are considered in this assessment: prehistoric, ethnographic, and historic.

Prehistoric archaeological resources are those materials relating to prehistoric human occupation and use of an area. These resources may include sites and deposits, structures, artifacts, rock art, trails, and other traces of Native American human behavior. In California, the prehistoric period began over 12,000 years ago and extended through the eighteenth century until 1769, when the first Europeans settled in California.

Ethnographic resources are those materials important to the heritage of a particular ethnic or cultural group, such as Native Americans or African, European, or Asian immigrants. They may include traditional resource collecting areas, ceremonial sites, topographic features, cemeteries, shrines, or ethnic neighborhoods and structures.

Historic-period resources are those materials, archaeological and architectural, usually associated with Euro-American exploration and settlement of an area and the beginning of a written historic record. They may include archaeological deposits, sites, structures, traveled ways, artifacts, or other evidence of human activity. Under federal and state requirements, historic cultural resources must be greater than fifty years old to be considered of potential historic importance. A resource less than fifty years of age may be historically important if the resource is of exceptional importance.

For the ISEGS project, staff provides an overview of the environmental setting and history of the project area, an inventory of the cultural resources identified in the project vicinity, and an analysis of the potential impacts from the proposed project using criteria from the California Environmental Quality Act (CEQA). The primary concern is to ensure that all potential impacts are identified and that conditions are set forth that ensure that impacts are mitigated below the level of significance.

If cultural resources are identified, staff determines whether there may be a project-related impact to them. If the cultural resources cannot be avoided, staff determines whether any of the impacted resources are eligible for the California Register of Historical Resources (CRHR) or the National Register of Historic Places (NRHP). If impacted resources are eligible for the register, staff recommends mitigation measures that ensure that impacts to the identified cultural resources are reduced to a less-than-significant level.

LAWS, ORDINANCES, REGULATION, AND STANDARDS

Projects licensed by the Energy Commission are reviewed to ensure compliance with all applicable laws. For the present analysis the applicable laws are primarily state laws. Although the Energy Commission has exclusive permitting authority over ISEGS, it typically ensures compliance with all applicable laws, ordinances, regulations, standards, plans, and policies.

CULTURAL RESOURCES TABLE 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
Federal	
36 CFR Part 800, implementing regulations of Section 106 of the National Historic Preservation Act	This regulation requires Federal agencies to take into account the effects of a proposed action on cultural resources.
National Environmental Policy Act (NEPA): Title 42, USC, section 4321-et seq.	This statute requires Federal agencies to consider potential environmental impacts of projects with Federal involvement and to consider appropriate mitigation measures.
Federal Land Policy and Management Act (FLPMA): Title 43, USC, section 1701 et seq.	This statute requires the Secretary of the Interior to retain and maintain public lands in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric water resource, and archeological values [Section 1701(a)(8)]; the Secretary, with respect to the public lands, shall promulgate rules and regulations to carry out the purposes of this Act and of other laws applicable to public lands [Section 1740].
Federal Guidelines for Historic Preservation Projects, Federal Register 44739-44738, 190 (September 30, 1983)	The Secretary of the Interior has published a set of Standards and Guidelines for Archeology[1] and Historic Preservation. These are considered to be the appropriate professional methods and techniques for the preservation of archeological and historic properties. The Secretary's standards and guidelines are used by Federal agencies, such as the Forest Service, the Bureau of Land Management, and the National Park Service. The California Office of Historic Preservation refers to these standards in its requirements for selection of qualified personnel and in the mitigation of potential impacts to cultural resources on public lands in California.
Executive Order 11593 May 13, 1971 (36 Federal Register 8921)	This order mandates the protection and enhancement of the cultural environment through providing leadership, establishing state offices of historic preservation, and developing criteria for assessing resource values.
American Indian Religious Freedom Act; Title 42, USC, Section 1996	Protects Native American religious practices, ethnic heritage sites, and land uses.

[1] Laws, ordinances, regulations, standards, and organizations may use different spellings of the word archaeology/archeology. Both spellings are acceptable in the English language (Morris 1976). Citations of LORS or the names of organizations will always use the spelling as it appears in the LORS or name.

Applicable Law	Description
Native American Graves Protection and Repatriation Act (1990); Title 25, USC Section 3001, et seq.,	The stature defines “cultural items,” “sacred objects,” and “objects of cultural patrimony;” establishes an ownership hierarchy; provides for review; allows excavation of human remains, but stipulates return of the remains according to ownership; sets penalties; calls for inventories; and provides for the return of specified cultural items.
U.S. Dept. of the Interior, Bureau of Land Manage-ment (BLM), the California Desert Conservation Area Plan 1980 as amended (CDCA)– Cultural Resources Element Goals	1. Broaden the archeological and historical knowledge of the CDCA through continuing efforts and the use of existing data. Continue the effort to identify the full array of the CDCA’s cultural resources.
	2. Preserve and protect representative sample of the full array of the CDCA’s cultural resources.
	3. Ensure that cultural resources are given full consideration in land use planning and management decisions, and ensure that BLM-authorized actions avoid inadvertent impacts.
	4. Ensure proper data recovery of significant (National Register of Historic Places-quality) cultural resources where adverse impacts can not be avoided.
State	
Public Resources Code 5097.98 (b) and (e)	Requires a landowner on whose property Native American human remains are found to limit further development activity in the vicinity until he/she confers with the Native American Heritage Commission-identified Most Likely Descendents (MLDs) to consider treatment options. In the absence of MLDs or of a treatment acceptable to all parties, the landowner is required to reinter the remains elsewhere on the property in a location not subject to further disturbance.
California Health and Safety Code, Section 7050.5	This code makes it a misdemeanor to disturb or remove human remains found outside a cemetery. This code also requires a project owner to halt construction if human remains are discovered and to contact the county coroner.
Local	
County of San Bernardino 2007 General Plan, Conservation Element, Goal CO 3 and Policies 3.1–3.5	The cultural and paleontological resources goal of the County is to preserve and promote its historic and prehistoric cultural heritage. The County intends to achieve this goal through the implementation of policies that identify and protect important archaeological and historic cultural resources in areas of the county that have been determined to have known cultural resource sensitivity, and on all lands where disturbance of previously undisturbed ground will occur. The County will, further, establish programs to preserve the information and heritage value of cultural and historical resources, comply with California Government Code Section 65352.2 (SB18) on all General Plan and specific plan actions, and ensure that important cultural resources are avoided or minimized to protect Native American beliefs and traditions.

SETTING

Information provided regarding the setting of the proposed project places it in its geographical and geological contexts and specifies the technical description of the project. Additionally, the archaeological, ethnographic, and historic backgrounds provide the contexts for the evaluation of the historical significance of any identified cultural resources within the project area of analysis.

REGIONAL SETTING

The proposed project area is in the Ivanpah Valley of the eastern Mojave Desert approximately 49 miles south-southwest of Las Vegas in San Bernardino County, California. The eastern Mojave Desert is a part of the Basin and Range physiographic province (Fenneman 1931), a broad region of almost parallel, block-faulted mountain ranges that trend approximately north to south and are characteristically separated by internally draining, debris-filled structural basins. The erosion of the largely Cenozoic era (beginning 65 million years ago and continuing to the present) ranges continues to contribute sediment to the poorly sorted gravel aprons or bajadas that predominate along the range flanks. The bajadas form most valley margins as they slope gradually down to the basin bottoms where seasonal lakes or playas often form. Low fault scarps and alluvial fans at the mouths of canyons periodically break the smooth, low-angle sweep of the bajadas (Eaton 1981; Thompson and Burke 1974). Local elevations in this part of the Mojave Desert range from approximately 1,700 to 2,600 feet above sea level on the valley bottoms to 4,900 to 7,900 feet above sea level along mountain range ridges. A bi-seasonal precipitation pattern in the eastern Mojave Desert delivers an average of six inches of annual rainfall from November through April and from July through September, with cool season precipitation being more significant (Hereford 2004). The largely alluvial parent material of the region's bajadas and valley bottoms, and the desert climate generally, support more weakly developed soil orders (Entisols and Aridisols) (NRCS 2007) where a Mojave Creosote Bush Scrub vegetation type predominates (BSE2007a, p. 5.2-9).

PROJECT, SITE, AND VICINITY DESCRIPTION

The site of the proposed project is on the middle portion of a bajada above and to the west of Ivanpah Dry Lake, a large playa that forms the bottom of Ivanpah Valley. The use of the project area, presently under the jurisdiction of the Needles Field Office in the U. S. Bureau of Land Management's (BLM) California Desert District, has historically been rather marginal. A sparse veneer of stone tools and stone chipping debris evidence a transitory Native American use of the project area and vicinity in the period prior to complete Euroamerican subjugation. The project area also appears to have been subject to sporadic prospecting for mineral resources over the last approximately 160 years. Sporadic mineral prospecting in and near the project area continues today. The eroded mountain remnants that jut above the relatively smooth, sloping surface of the proposed project area, landforms known as inselbergs, show evidence, in the form of abandoned and active prospect pits, of exploratory activity. The proposed project area's concurrent historic use has been for low intensity livestock grazing. The property continues this tradition of use today as part of the BLM Clark Mountain Allotment Grazing Lease (Clark Mountain Allotment) (BSE2007a, p. 5.6-14) adjacent to the Primm Valley Golf Club, Desert Course.

The proposed project involves the construction and operation of an approximately 400-MW concentrating solar power electric generation facility on a project area of approximately 4,065 acres. The project is proposed to be built in three phases, Ivanpah No. 1 (100 MW), Ivanpah No. 2 (100 MW), and Ivanpah No. 3 (200 MW), which would each be separate concentrating solar power plants. The three plants would be developed on contiguous property, sharing an administration and warehouse building, an operation and maintenance building, and a substation. The administration and warehouse building, a substation, a sewage package treatment plant, and detention ponds would be located between Ivanpah No. 1 and Ivanpah No. 2.

The three power plants each have the same basic types of components, arrays of mirrors or heliostats that are double-mounted on poles around central solar power towers. The Ivanpah No. 1 and Ivanpah No. 2 plants would each consist of approximately 110,000 heliostats, double-mounted on 55,000 poles, in a single array around a centralized solar power tower. The Ivanpah No. 3 plant would consist of approximately 208,000 heliostats, double-mounted on 104,000 poles, in five separate arrays. The five arrays will each be arced around a separate solar power tower. Each of the seven solar power towers for the project would be 469 feet tall.

Each of the three power plants would have a separate infrastructure system. The infrastructure for each of the three plants would include a power block facility that would house a natural gas-fired start-up boiler, air emission control system for the combustion of natural gas in the start-up boiler, steam turbine generator, an air-cooled condenser, wastewater treatment equipment, auxiliary equipment such as boiler commissioning and emergency outfall holding basins, and chemical storage containment areas. Plant infrastructure would also include a 250,000-gallon capacity raw water tank, dirt, gravel, or paved access and maintenance roads, storm water retention basins and diversion channels, and perimeter fencing.

The operation of the generation facility as a whole would require the development of further infrastructure. The natural gas-fired start-up boiler that is part of the power block facility for each of the three plants would draw natural gas from the Kern River Gas Transmission pipeline that is approximately 0.5 miles north of Ivanpah No. 3. An underground distribution pipeline would need to be installed to feed the start-up boiler at each power block facility. Raw groundwater needed for the whole facility would be drawn from one of two wells which would be constructed at the northwestern corner of Ivanpah No. 1, just outside the perimeter fence. Underground water pipelines would connect each of the three power blocks to the groundwater wells.

The transmission of the electricity that the generation facility produces would also require the construction of new transmission infrastructure and major upgrades to an existing transmission line. The ISEGS project would be interconnected to the Southern California Edison (SCE) grid by three new 115-kV transmission generation tie lines, a new substation that includes 230-kV/115-kV switch-racks, and upgrades to the SCE Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115-kV transmission line, which traverses the project site between the proposed Ivanpah No. 1 and Ivanpah No. 2 (CH2ML2008q). In order to transmit the full generation load projected for the ISEGS

project and other planned electric generation projects, the California Independent Systems Operator (ISO) has determined that approximately 36 miles of the existing 115-kV transmission line would need to be upgraded. The upgrade would include constructing a new double-circuit 230-kV transmission line between the Eldorado Substation in Nevada and the proposed new Ivanpah Substation in California, a distance of approximately 36 miles. The existing 115-kV transmission line would be removed and replaced with the proposed 230-kV transmission line. SCE also plans to remove the portion of the subject transmission line from the project area southwest to the Mountain Pass Substation and to replace that portion of the line with two, double-circuit, 115-kV pole lines. Additional upgrades may be required as mitigation prior to final approval of interconnection to California ISO and Non-California ISO controlled facilities (California ISO 2008).

The construction of the proposed project would also require the applicant to take steps to preserve existing public access routes that presently traverse the project area. Vehicle trails run through the proposed project site. To allow continued use and access the applicant would reroute three public trails and one trail that serves as an access to a mining claim. Colosseum Road would be rerouted between Ivanpah No. 1 and Ivanpah No. 2.

Environmental Setting

The proposed project area is a roughly 4,065-acre expanse of what is today an arid bajada. The environment of the bajada has changed through time causing concomitant shifts in the mosaic of natural resources available on it and adjacent landforms. Human use of the proposed project area over the past several thousand years may partly reflect local changes in the natural resource base. To more reliably assess the likelihood that archaeological deposits representing such use may be present, it is important to consider the historic character of local climate change, or the paleoclimate, and the effects of the paleoclimate on the physical development of the bajada and its ecology.

Paleoclimate

The present climate in the proposed project area represents a moderately dry and harsh period in the climate of the region relative to the last 12,000 years, the minimum timeframe for a human presence in the Mojave Desert. The climate of the Mojave Desert since the late Pleistocene epoch (prior to 10,000 thousand years ago) can be split into three broad phases. The climate of the region during the Pleistocene was relatively much more moist or mesic than the present climate and led to the development of a number of large permanent lakes on the floors of the region's valleys. The lakes slowly evaporated during the early Holocene epoch (10 thousand years ago to present) as the climate progressively became more arid. The period from approximately 5000 to 3000 B.C. marks a time of extreme aridity, often referred to as the mid-Holocene Altithermal (see Antevs 1948), and it marks the final desiccation of the lakes in the region. The climate since approximately 3000 B.C. has typically been more mesic relative to conditions during the Altithermal, and there is evidence for particularly wet periods from approximately 1000 B.C. to A.D. 1, and again from approximately A.D. 500 to 1400 (Bamforth 1990, p. 72).

Geology

The proposed project area lies on the western flank of the Ivanpah Valley in the eastern Mojave Desert. The Ivanpah Valley is an elongate, internally draining, structural basin (Park, et al. 2003, p. 72), a bolson, which trends approximately north to south. It is roughly 44 miles in length, typically averages 15 miles in width, and ranges in elevation from 2,608 feet above sea level on the valley floor to between 5,883 and 7,897 feet above sea level along the surrounding mountain ridges. The Ivanpah Mountains, the Clark Mountain Range, and the Spring Mountains bound the valley to the southwest, west, and northwest, respectively. The Lucy Gray Mountains, McCollough Range, and the New York Mountains bound the valley to the northeast, east, and southeast, respectively. The Clark Mountain Range and the Spring Mountains form an arc of Mesozoic to Paleozoic marine and terrestrial sedimentary rocks around a core of earlier Precambrian metamorphic rocks, with Tertiary volcanic rocks infrequently intruding into the sedimentary formations of the Spring Mountains. Along the eastern margin of the valley, the Lucy Gray Mountains, the McCollough Mountain Range, and the northern portion of the New York Mountains include Precambrian intrusive igneous and metamorphic rocks and Tertiary volcanic rocks. The balance of the New York Mountains and the Ivanpah Mountains are almost entirely Mesozoic granitic rocks (Jennings 1961; House, Buck, and Ramelli 2006; Ramelli, House, and Buck 2006a, 2006b). This diverse group of rocks is the source of the clastic[2] sediments that make up the Quaternary landforms across the valley and form the substrate in which local soil types develop.

Geomorphology

The discussion of the geomorphology of the proposed project area considers how and when the underlying bajada may have developed, and helps provide the physical contexts to assess whether physical remains from the past human use of former land surfaces on the bajada may be present as archaeological deposits.

Process Geomorphology

The Ivanpah Valley contains examples of most of the major landforms that are characteristic of Basin and Range bolsons. Alluvial fans, fan remnants, and bajadas front the mountain ranges that ring the valley. Below the coarse alluvial fan and remnant fan deposits, the broad bajadas sweep gradually down onto Ivanpah Dry Lake, the playa that forms the bottom of the valley floor. Numerous intermittent stream channels flow out of the mountains over more recent alluvial fans and past older fan remnants to braid across bajada surfaces and terminate out on the playa. The fine sediments that these stream channels transport are the source of playa fill and the dune sand along the playa margins.

The proposed project area is on the middle portion of a bajada that drapes the eastern base of the Clark Mountain Range. The project area ranges from approximately 180 feet to 835 feet above the floor of the playa. Gravity and water variously act to transport and deposit the weathered bedrock sediments that make up the broad bajada of the proposed project area. The sediments are typically larger and more poorly sorted upslope toward the mountains and grade to finer, better sorted particles downslope

[2] Clasts are rock fragments produced by physical processes.

where the bajada deposits ultimately interfinger with the lacustrine[3] sediments of the playa and other wind-blown or eolian deposits, and water-transported or alluvial deposits related to the playa's hydrological cycles.

The present surface of the proposed project area bajada is a mosaic of interconnected or anastomosing, intermittent stream channels (Cultural Resources Plate 1) of mostly coarse to very coarse sands, incipient desert pavements[4] of predominately very angular gravels and variable overflow and sheetwash deposits. One large and one small inselberg break the surface of the bajada adjacent to the northern portion of the proposed project area and represent relatively infrequent examples of such landforms in Ivanpah Valley.

The proposed project area bajada is a dynamic landform the development of which has undoubtedly been subject to alternating cycles of deposition and erosion that occur in response to regional fluctuations in climate. The presence on the surface of the proposed project area, in overflow and sheetwash deposits and in incipient desert pavements, of mixtures of very angular gravels with relatively fresh faces or new cleavage planes and rounded, sand-blasted gravels with well-developed rock varnish indicate a relatively mobile bajada surface in the recent past where former desert pavements are being eroded as new ones are being formed. A firm understanding of whether the net result of the dynamic processes at work on the surface of the bajada is or has been the thickening of bajada deposits, or the erosion of them, is important to the interpretation of the history of the bajada's development, its potential as a resource base for human use, and its potential to preserve archaeological deposits related to any such use.

Historical Geomorphology

The results of a recent geoarchaeology study of the proposed project area indicates that the present surface of the underlying bajada is a patchwork of actively eroding surfaces amid what have become slightly elevated remnants of older bajada surfaces of predominantly middle-to-late Holocene age (CH2ML2008b, pp. 9–18). An analysis in that study of the beach zones beneath the vicinity of the project area along the edge of Ivanpah Dry Lake suggests that the character of sediment deposition on the bajada was progradational[5] after approximately 6700 B.C. Deposition of sediments along the base of the bajada buried the beach zone there that was formed during the last high stand of Ivanpah Dry Lake during the early Holocene. The depositional regime on the bajada changed to one of net erosion after approximately 2000 B.C., most likely in response to the general increase in effective moisture in the late Holocene that appears to have led to a concomitant increase in vegetation cover and a decrease in the available sediment load.

[3] Derived from lake environments.

[4] Desert pavements are single layers of clasts borne upward over time by the slow, continual accretion of wind-borne silt. They progressively become more level and darker in contrast, and the surface clasts in the pavements become more tightly interlocked with age.

[5] Progradation refers to a depositional regime on alluvial fans, which are constituent landforms of bajadas, where streams are cutting down through the upper slopes of alluvial fans and depositing the eroding sediments on the lower slopes of those same fans.

The morphology of the present surface of the bajada is the result of erosion over the last 4,000 years. A complex network of anastomosing, intermittent stream channels traverse the bajada among remnant patches of older bajada surfaces that now rise several feet above the eroding surface of the broader landform. The remnant surfaces cover approximately 472 acres or 12 percent of the approximately 4,065-acre proposed project area. The remnant older bajada surfaces appear darker in contrast and are stonier relative to adjacent eroded surfaces. Desert pavements or incipient desert pavements form many of the remnant surfaces, while a few are more appropriately considered as stony debris flow remnants. Two of the darker (older) remnant surfaces observed in the recent study appear, on the basis of comparison to pavements in the Mojave Sink approximately 35 miles to the west, to be no older than early Holocene in age.

Pedology

The distribution of soil types over the bajada of the proposed project area provides a further index of the relative stability of different portions of the bajada's surface. The downslope portions of the proposed project area, where more recent alluvial deposits such as inset fans and intermittent stream floodplains and channels predominate, support the Arizo loamy sand, a very deep, excessively drained soil that forms in mixed alluvium. Arizo series soils are Entisols, an order where the parent material is clearly evident and where distinct soil horizons are absent.

The upslope portions of the proposed project area where older, more stable landforms such as alluvial fan remnants are present support the Popups sandy loam, a moderately deep, well-drained soil that also forms in mixed alluvium. Popups series soils are Aridisols, an order where soils develop distinct horizons under arid conditions. The development of a weakly cemented duripan approximately 33 to 59 inches below the surface is a characteristic of the Popups series that indicates a relative antiquity for soil types of the series.

Paleoecology

The ecology of the proposed project area has been dynamic through time. The vegetation type that is presently predominant in the project area is the Mojave Creosote Bush Scrub, which is typical in and on the valleys, alluvial fans, and lower mountain slopes of the Mojave Desert. The Mojave Yucca-Nevada Ephedra Scrub and Mojave Wash Scrub types are also present. The diversity of the vegetation types and the plant species in the project area generally decrease as one moves downslope across the project area bajada (BSE2007a, pp. 5.2-9, 5.2-27, and 5.2B-1).

The vegetation types above and to the west of the proposed project area vary as one ascends the slopes of the Clark Mountain Range. The Mojave Creosote Bush Scrub vegetation type grades into the Joshua Tree Woodland which, in turn, grades into the Piñon Pine-Juniper Woodland. This clinal[6] variation in vegetation patterns is common in southern California (Holland and Keil 1995, p. 397).

[6] A gradual change in a character or feature across the distributional range of a species or population, usually correlated with an environmental or geographic transition.

It is probable that the composition and pattern of local vegetation types has moved up and down in elevation across the proposed project area over the last 12,000 years in response to regional shifts in climate. A woodland association of *Pinus monophylla* (piñon pine), *Juniperus osteosperma* (Utah juniper), *Purshia mexicana* (bitterbush), *Cercocarpus ledifolius* (mountain mahogany), and *Prunus fasciculata* (desert almond) was found prior to approximately 9500 B.C. in areas higher than 3000 feet above sea level where *Larrea tridentata* (creosote bush) presently prevails. A desert scrub association of *Lycium cooperi* (wolfberry), *Salvia mojavensis* (Mojave sage), and *Prosopis juliflora* (mesquite) was found from approximately 8800 to 8400 B.C. near lacustrine shorelines in the region lower than 3,000 feet below sea level. Creosote bush does not appear to have become dominant in the region before 3000 B.C. And modern vegetation associations do not appear to have been in place before approximately 2500 B.C. (Koehler, Anderson, and Spaulding 2005).

Prehistoric Setting

The prehistory of the eastern Mojave Desert is the narrative of how human populations have adapted to marked fluctuations in the local environment over the course of at least the last 12,000 years. The archaeological remains of the region's prehistory are relatively scarce. Sparse scatters of stone tools and chipped stone tool manufacturing debris, and isolated artifacts, resources that typically yield information of marginal value, account for 40 to 60 percent of the archaeological remains found in the Mojave and Colorado Deserts. A relative paucity of intact buried archaeological deposits contributes further to the dearth of information on the prehistory of the region (Lyneis and Macko 1986, p. 52). The availability of water and the location of high-value resource patches in otherwise unproductive habitats appear to influence the distribution of the archaeological sites that are on the desert landscape (Lyneis and Macko 1986, p. 57; Sutton et al. 2007, p. 230). The broad trajectory of cultural development in the Mojave Desert appears to be a steady decline in residential mobility as local populations come to occupy increasingly larger valley or basin bottom base camps, in a few preferred locations, over longer periods of time, rather than working out of temporary camps in particularly productive environmental zones (Bamforth 1990, p. 74).

Over the past seven decades, Mojave Desert archaeologists have developed and refined a broad sequence of approximately six artifact groups or assemblages, each with distinctive types of stone projectiles, that represent the material record of the peoples who once lived in the proposed project area (Bamforth 1990, p. 72; Campbell 1936; Lyneis 1982; Rogers 1939; Sutton, et al. 2007; Warren 1984; Warren and Crabtree 1986). Choosing what staff believes to be a cultural chronology more applicable to the proposed project area than that used in the AFC (BSE2007a, pp. 5.3-7–5.3-10) and acknowledging recent proposed refinements to the chosen chronology (Sutton, et al. 2007), the discussion here of the region's prehistory will rely primarily on Warren's 1984 chronology and Warren and Crabtree's 1986 chronology. Following Warren and Crabtree, the periods of the chronology below represent units of time during which particular artifact assemblages appear to prevail rather than discrete, homogeneous past cultures.

Terminal Pleistocene Period (Prior to 10,000 B.C.)

The archaeological record of the Terminal Pleistocene Period in the Mojave Desert is particularly sparse. The most consistent evidence for human activity during this period are fragments of the characteristic fluted, concave-based, lanceolate spear or projectile point of the Clovis archaeological culture. The Clovis culture is a pan-Western Hemisphere archaeological phenomenon that manifests in diverse material patterns over North and South America. In the Mojave Desert, material culture assemblages that include Clovis projectile point fragments are typically sparse surface deposits (Lyneis and Macko 1986, p. 41). The evidence from such deposits suggests only that human groups during this time were probably small in number, were highly mobile, and lived in small, temporary camps near what were then permanent water sources (Sutton, et al. 2007, p. 234). It is unclear whether the Mojave Desert Clovis assemblages demonstrate a cultural continuity with the material remains of subsequent periods (Warren and Crabtree 1986, p. 184).

Lake Mojave Period (10,000 to 5000 B.C.)

Lake Mojave Period artifact assemblages appear to represent a cultural phenomenon that is antecedent to subsequent cultural developments in the Mojave Desert (Warren and Crabtree 1986, p. 184). Portions of archaeological sites or components that date to the Lake Mojave Period are typically sparse and vary little in assemblage composition (Bamforth 1990, p. 73), although components that include extensive accumulations of residential debris have more recently been found (Sutton, et al. 2007, p. 237). Lake Mojave components are most often found in the vicinity of high terraces above or on relict shorelines of what are now playas and along relict stream channels (Bamforth 1990, p. 72; Lyneis and Macko 1986, p. 41).

Lake Mojave Period assemblages include a relatively narrow range of stone tools and also represent a narrow range of site types. The index artifacts for the period are the local variants of the Great Basin stemmed series projectile point types, Lake Mojave and Silver Lake points. The balance of period assemblages may include bifaces, steep-edged unifaces, “small beaked gravers,” “narrow concave scrapers,” crescents, and occasional cobble-core tools and ground stone implements (Sutton, et al. 2007, p. 234; Warren 1984, p. 413). The assemblages primarily appear to represent temporary small camps and work stations. Infrequent accumulations of residential debris do indicate, however, that camps with longer use periods are also present.

The archaeological record of the Lake Mojave Period indicates that human populations during the Early Holocene were small, mobile groups practicing a hunting-and-foraging economy whereby groups shifted residency across the landscape among the most productive environmental zones as the resources in those zones became depleted over time (Bamforth 1990, p. 73; Lyneis and Macko 1986, p. 41).

Pinto Period (5000 to 2000 B.C.)

The evidence of human activity found in Pinto Period archaeological sites indicates a behavioral continuity with Lake Mojave Period developments (Warren 1984, p. 414). The Pinto Period witnesses the final desiccation of the Pleistocene pluvial lakes in the Mojave Desert and the adaptive transformation of local populations to the extreme

aridity of the mid-Holocene Altithermal (see Antevs 1948). It is unclear whether the Pinto Period directly follows the Lake Mojave Period, or may represent a resumption of the desert's use after a hiatus during the worst of the mid-Holocene droughts (Warren and Crabtree 1986, p. 184). Pinto Period components are typically surface deposits that are small in area and do not include midden deposits, constituent residential debris of ash, charcoal, and food and other organic residues, although larger components with broader ranges of artifacts and substantial midden deposits have more recently been found (Sutton, et al. 2007, p. 238, Warren 1984, p. 413 and 414). Pinto Period components are generally found on the landscape in the same places as deposits of the Lake Mojave Period (Bamforth 1990, p. 72, Lyneis and Macko 1986, p. 41). The suggestion has been made that the components may actually overlap in time (Bamforth 1990, p. 73, Sutton, et al. 2007, p. 238).

The most important distinction between the artifact assemblages of the Pinto Period and those of the preceding Lake Mojave Period appears to be the relative abundance of ground stone implements or milling tools. More recent research has found milling tools to occur in moderate abundance in most Pinto Period deposits and, occasionally, in great frequency (Sutton, et al. 2007, p. 238). The characteristic Pinto Period assemblage includes large and small leaf-shaped projectile points and knives, domed and elongated keeled scrapers, several forms of well-made flake scrapers, flat millingstones, and manos. Drills, engraving tools, and *Olivella* spp. shell beads also occur (Sutton, et al. 2008, p. 238; Warren 1984, p. 412; Warren and Crabtree 1986, p. 187). The index artifact for the period is the stemmed, indented-base Pinto series projectile point, the Mojave Desert variety of which is markedly crude in form and manufacture (Warren 1984, p. 411). A broad continuity in the chipped stone technology evident in both the Lake Mojave and Pinto Periods has been noted. Populations during these periods appear to make extensive use of toolstones[7] other than cryptocrystalline silica or obsidian, and they also make regular use of unifacial and bifacial core tool forms (Sutton, et al. 2007, p. 238).

More recent research indicates that Pinto Period assemblages may reflect the emergence of a two-tier settlement pattern. The small temporary or seasonal camps that appear to have been the primary focus of Lake Mojave Period activity may have become more task-specific camps that were subordinate to more permanent residential base camps. The increase during the Pinto Period in the relative frequency of milling tools suggests a corresponding increase in the reliance of local populations on plant resources (Sutton 2007, pp. 238–239).

Gypsum Period (2000 B.C. to A.D. 500)

Gypsum Period artifact assemblages, though scarce relative to earlier and later periods, appear to evidence a shift in the economy of local populations toward a much greater dependence on plant resources (Bamforth 1990, p. 73; Warren 1984, p. 419). Period

[7] Toolstone is a type of stone used to manufacture stone tools. Generally speaking, tools that require a sharp edge are made using cryptocrystalline materials that fracture in an easily-controlled conchoidal manner. Cryptocrystalline tool stones include flint, chert, rhyolite, and obsidian. These materials fracture in a predictable fashion, and are easily resharpened.

components are ephemeral in character, relatively more scarce in the southern and eastern portion of the Mojave Desert, smaller yet more numerous than components of the preceding periods, and found in more diverse locations on the landscape (Sutton, et al. 2007, p. 241).

Gypsum Period assemblages encompass a relatively broad array of artifact types. The index artifacts for the period include any combination of Gypsum (Gypsum Cave), Humboldt (Humboldt Concave Base), or Elko (Elko Eared, Elko Corner-notched) series projectile points (Sutton, et al. 2007, p. 241; Warren 1984, p. 414; Warren and Crabtree 1986, p. 187). The balance of period assemblages may include leaf-shaped projectile points; rectangular-based knives; flake scrapers; T-shaped drills; occasional large scraper-planes; choppers; hammerstones; manos and millingstones; mortars and pestles; shaft smoothers incised slate and sandstone tablets and pendants; fragments of drilled slate tubes; *Haliotis* spp. Rings; central California Middle Horizon bead and ornament types; *Olivella* spp. shell beads; and bone awls (Warren 1984, p. 418). The greater presence of quartz crystals, paint, split-twig figurines, and rock art also indicates the elaboration of ritual activity during this period (Warren and Crabtree 1986, pp. 188–189). The influence of the Anasazi archaeological culture of the Southwest is apparent in the eastern Mojave Desert toward the end of the Gypsum Period with the introduction of Anasazi ceramic types to period assemblages, and evidence of the replacement of the atlatl with the bow and arrow, as the larger Gypsum, Humboldt, and Elko series dart points give way to smaller Eastgate and Rose Spring arrow point types in the subsequent Saratoga Springs Period (Warren 1984, pp. 414–415).

The relative scarcity of Gypsum Period data complicates discussions of period settlement patterns in the Mojave Desert. Available data indicates that the focus of Gypsum Period components was lowland concentrations of plant resources along streams and in the lake basins (Bamforth 1990, p. 73; Sutton, et al. 2007, p. 241). One such resource may have been mesquite. The introduction of the mortar and pestle during this period and the use of these tools in the historic period to process mesquite pods have been taken to indicate that mesquite was first used in the Gypsum Period (Warren 1984, p. 419). Populations appear to have spent a substantial part of each year in residential base camps while dispatching task groups out to hunt (Bamforth 1990, p. 73). The presence of shell ornaments in the assemblages of the period also indicates the establishment of relatively routine trade with the southern California coast (Warren 1984, p. 419).

Saratoga Springs Period (A.D. 500 to 1200)

The artifact assemblages of the Sarasota Springs Period in the eastern Mojave Desert reflect the mixture of cultures that appears to have influenced the region.

Saratoga Springs Period assemblages encompass a broad, diverse array of artifact types, many of which appear to come from outside the region or reflect outside influences. The index artifacts for the period include Eastgate and Rose Spring projectile points. The core of the period assemblage includes millingstones and manos, mortars and pestles, incised stones, and slate pendants (Warren 1984, p. 420). Other characteristic artifact types of the period include small triangular knives, scrapers, drills, hammerstones, choppers, pendants of green schist, and Pacific Coast shell ornaments,

including *Olivella* Saucer beads, *Olivella* Barrel beads, and limpet rings (Warren 1984, p. 367). Anasazi grayware ceramics of the Basketmaker III through early Pueblo Periods (Pecos Classification, see Cordell 1984, pp. 55–58) are a notable element of the Saratoga Springs Period assemblage as well.

The archaeological data for the Saratoga Springs Period appear to indicate that local populations were developing broader spheres of interaction with outside groups, perhaps even allowing settlements of outsiders, in the context of a general continuity in local settlement patterns. The basic settlement pattern for the period appears not to change markedly from the Gypsum Period through to the Protohistoric Period (see below). The size of residential base camps and seasonal population dispersions to acquire more remote resources may both have been in slow decline however. The overexploitation of large mammals, due, in part, to the introduction of the bow and arrow during this period and to a deteriorating climate, may have led to a shift in hunting emphasis to small animals and reinforced the primary dependence of local populations on plant seed resources such as mesquite (Bamforth 1990, p. 74).

The Anasazi influence, presumably of the Virgin Branch (see Fowler and Madsen 1986, pp. 175–181), was marked in the eastern Mojave Desert during this period from at least A.D. 700 through A.D. 1150 (Warren 1984, pp. 373–373, 426–427). The distribution of Anasazi grayware ceramics, the key archaeological index of Anasazi influence, reaches from the lower Virgin River in southern Nevada into California as far west as the Cronise Basin in San Bernardino County. The primary focus of Anasazi influence in the vicinity of the proposed project area appears to have been the turquoise deposits in the area around Halloran Springs, roughly 30 miles southwest of the proposed project area. The sequence of ceramic types found at the turquoise mines in the area indicate that the period of Anasazi influence there was from approximately A.D. 700 to 900, during the Basketmaker III and Pueblo I Periods (Warren 1984, pp. 371–372). It remains unclear whether Anasazi peoples were actually in residence in the area (Warren 1984, p. 422) practicing the Virgin Branch horticultural lifeway, in residence living on stores of provisions, or not in residence and managing the extraction of turquoise through proxy labor. The Anasazi influence over the eastern Mojave Desert ultimately terminates around A.D. 1150 (Warren 1984, pp. 426–427).

Protohistoric Period (A.D. 1200 to present)

The speakers of Numic languages appear to displace the local populations of the eastern Mojave Desert at the outset of the Protohistoric Period, and to decisively eradicate Anasazi influence in the region (Warren 1984, p. 430).

The Protohistoric assemblage has been said to relate directly to the historic Paiute (Warren 1984, p. 427). The characteristic index artifacts for assemblages of the more northerly areas of the eastern Mojave Desert are Desert Side-notched projectile points and coarse, brownware ceramic types. The overall eastern Mojave assemblage strongly resembles assemblages across the northern Mojave Desert to Owens Valley and may derive from that region. Assemblages from the more southerly areas of the eastern Mojave Desert include Cottonwood Triangular projectile points, in addition to Desert Side-notched points, and the ceramic assemblage includes types representative of the Hakataya archaeological culture, a cultural unit of the Lower Colorado River and the

Colorado Desert. Among the Hakataya ceramics in the Protohistoric Period assemblages of the eastern Mojave Desert are brownwares, buffwares, and red-on-buff wares (Warren 1984, p. 427; Warren and Crabtree 1986, p. 191).

Despite the apparent shifts in the local populations in the eastern Mojave Desert and the ebb and flow of outside influences during the Sarasota Springs and Protohistoric Periods, the basic economic milieu and the settlement patterns of the local populations continue, in the Protohistoric Period, to reflect the trends in desert adaptation that had been developing in the Mojave Desert for millennia. Among the final elaborations to the local economy of the populations in the Mojave Desert may have been the addition, during the late Saratoga Springs Period and into the Protohistoric Period, of small gardens in preferred areas, the produce from which may have supplemented local diets in a minor way (Lyneis and Macko 1986, p. 41).

The influence of the Anasazi in the eastern Mojave Desert is supplanted by Hakataya influence from the Lower Colorado River and the Colorado Desert. Toward the end of the Saratoga Springs Period or the beginning of the Protohistoric Period around A.D. 1200, there is evidence of Hakataya influence or presence at the Halloran Springs turquoise mines lasting roughly a century. The Paiute have used the mines infrequently subsequent to the withdrawal of the Hakataya in about the fourteenth century (Warren 1984, p. 372 and 373).

Ethnographic Setting

The project area of analysis appears, on the basis of the available ethnographic literature, to fall in the ancestral territories of three major Native American groups, the Southern Paiute (Las Vegas Paiute and Pahrump Paiute), the Chemehuevi, and the Mojave. The Las Vegas Paiute, the Chemehuevi, and the Mojave made use of overlapping portions of the eastern Mojave Desert. The portions of the region that each group used and the ways that each group made use of those portions varied through time (Bean, Vane, and Young 1982:M-2). Brief discussions of the ethnography and the history of the Numic-speaking Southern Paiute and of the Mojave provide a transition for the cultural history of the region from late prehistory into the period of sustained European and Euroamerican contact and subjugation, and provides one context for the recognition and interpretation of ethnographic resources that may be in the project area of analysis.

Southern Paiute and Chemehuevi

The Southern Paiute peoples and the Chemehuevi, a closely related people, belong to the Southern Numic branch of the Uto-Aztecan language family. The territory of the Las Vegas Paiutes and the Pahrump Paiutes during the nineteenth century included an area from roughly Death Valley east to the Colorado River and from just north of present-day Las Vegas south to just north of the City of Needles, California. Chemehuevi territory during that period abuts the Las Vegas Paiute and Pahrump Paiute territory on the north and runs south to approximately the City of Blythe, California, to the west of the Colorado River (Kelly and Fowler 1986:figure 1). The nineteenth-century territories of the Southern Paiute and Chemehuevi groups reflect the adaptation of each to their unique physical and political environments subsequent to the apparent entry of Numic-

speakers into the region at approximately A.D. 1200 (see *Protohistoric Period* subsection above).

The economy of the Southern Paiute in general was largely one of subsistence. The particular variety of plant and animal resources used in the territory of each Southern Paiute group was dependent upon the mosaic of vegetation types found there. Major plant resources for the Las Vegas Paiute, the Pahrump Paiute, and the Chemehuevi included piñon nuts (*Pinus monophylla*), mesquite pods (*Prosopis juliflora*), and agave (*Agave utahensis*). A variety of seed resources were a lesser, although important food source (Kelly and Fowler 1986:370).

The chief source of protein for Southern Paiute groups was small game. Such game included rabbits, wood rats, mice, gophers, squirrels, chipmunks, and birds. Lizards, snakes, chuckwalla, and tortoise were also eaten, as were insect resources such as locusts, ant larvae, and caterpillars. Large game resources such as antelope and mountain sheep were supplementary protein sources.

Southern Paiute foraging and collecting schemes were supplemented in the late Protohistoric and early historic periods with floodplain and, apparently, irrigation agriculture. Typical cultigens, variously introduced from the North American Southwest, Mexico, and the lower Colorado River , included maize, squash, pumpkins, gourds, and, less frequently, beans. Other cultigens appear to be more local domesticates that came from the Mojave, and introduced European cultigens ultimately became more significant crop resources (Kelly and Fowler 1986:370).

The sociopolitical organization of the Southern Paiute groups did not include organs of central political control. The boundary for each group appears to have been relatively fluid and permeable. Groups were essentially clusters of individual households that variously coalesced and dispersed during the year to facilitate different economic pursuits. Favored residence locations adjacent to springs or agricultural plots were held as private property and subject to inheritance. Large household clusters often had a headman, whose authority was more advisory than authoritative (Kelly and Fowler 1986:380).

Mojave

The Mojave belong to the River branch of the Yuman language family (Kendall 1983). The core ancestral territory of the Mojave, possibly established as early as A.D. 1150, appears to have been what is now known as the Mohave Valley along the lower Colorado River. By the mid-nineteenth century, Mojave territory expanded to run along the lower Colorado River from roughly 25 miles north of Bullhead City, Arizona south to roughly 5 miles north of the City of Blythe, California (Stewart 1983:55).

The primary focus of the Mojave economy was agriculture. The group farmed the floodplain of the Colorado River relying on the annual overflow deposition of silt and organic matter to rejuvenate soil fertility. The principal crop was maize with Tepary beans, pumpkins, and melons being secondary cultigens (Stewart 1983:57 and 58).

The Mojave supplemented their agricultural pursuits with the foraging and collecting of wild plant resources, with fishing along the Colorado River, and, to a lesser degree, with hunting. Commonly used plant resources included a variety of seed plants, cactus fruit and other desert plants from the mesas adjacent to the river, and the pods of both mesquite (*Prosopis juliflora*) and screwbean (*Prosopis pubescens*) (Stewart 1983:57 and 59).

Fish was the primary source of meat for the Mojave. Fishing was typically done with dip nets, seines or drag nets, traps or weirs, or large, canoe-shaped basketry scoops with long handles along the Colorado River, or in muddy side sloughs or ponds (Stewart 1983:59).

Hunting was of relatively minor significance to the economy of the Mojave and was, as a consequence, less well developed as a cultural skill than among other adjacent groups out in the desert (Stewart 1983:59).

The Mojave may be thought of as a tribe (see Service 1962). They appear to have and to continue to regard themselves as one people. The tribe appears to be divided into three bands or more local groups, the northern, central, and southern divisions. Historically, each band was, in turn, further divided into settlements that were sprawling clusters of residences on low floodplain knolls adjacent to arable land. The nucleus of each settlement was an extended family. Each settlement appears to have had a group leader, and each band appears to have had one or several subchiefs. The tribe as a whole had a head chief, but the longevity of this position of status, prior to the arrival of the Europeans, is uncertain. Authority among the Mojave was derived from the ongoing consensus of subordinate tribal members. There was also only a minimal or incipient development of tribal political institutions (Stewart 1983:57 and 62).

Historic Setting

Roads

Much of the important history of the Mojave Desert took place beyond the proposed project area. The historic period of the region begins in 1776 with the travels of Francisco Garces between the Colorado River and the Mission system of coastal California. He became the first European to cross the Mojave Desert. His route followed the Native American trails (Mojave Trail) between the Needles area on the Colorado River, across to the Mojave River, and then through the Cajon Pass.

During the time of Mexican sovereignty in the area, in 1826 and again in 1827, Jedediah Strong Smith crossed the Mojave Desert via the Mojave Trail, both times traveling from east to west only. Smith was followed by early travelers to the region such as Ewing Young in 1829. Kit Carson was a notable member of Young's party. The Antonio Armijo party of 1829-30 was the first to complete a trip between Santa Fe and Los Angeles and the first known to have traveled a different route across the Mojave Desert. This route, a more northerly route, connected Las Vegas, Resting Springs, the Amargosa River, Salt Creek, and Bitter Springs with the Mojave Road near present-day Daggett. John C. Fremont traveled this route in 1844. While it is a matter of debate whether or not the

Amargosa River Route was the trail of the Spanish caravans, known as the Old Spanish Trail, it became the preferred route of travel between Salt Lake City and San Bernardino, connecting two distant Mormon communities following the War with Mexico in 1846.

Following the discovery of gold in California in 1848 and California statehood in 1850, increased traffic occurred in the Mojave Desert, much of it along the Old Spanish Trail or Mormon Road. Alterations to the Old Spanish Trail occurred after the discovery of the Kingston Cut-off in 1855 as well as other "short-cuts." These two routes, the Mojave Road, and the Old Spanish Trail or Mormon Road, were the primary nineteenth-century transportation routes through the Mojave Desert prior to the construction of railroads in the region (Warren, Knack, and Warren 1980; Warren and Roske 1981).

Mining

In addition to transportation routes, another major historic theme in the Mojave Desert during the American period (post-1846) was mining. A party of Mormons, led by Jefferson Hunt, discovered gold in the Salt Creek area, approximately 44 miles west of the proposed project area, in December of 1849. Sporadic attempts at mining in the Salt Creek area, as well as in other areas of the Mojave Desert and the San Bernardino Mountains, were hampered by ongoing conflicts with local Native American groups, who resisted the invasion of their respective territories.

Killings of miners resulted in a series of American military expeditions into the Mojave Desert around 1860 and led to the establishment of a number of military posts to the south of the proposed project area (Fort Cady, Hancock's Redoubt at Soda Springs, Rock Springs, and Fort Paiute). In addition, military posts were located in the San Bernardino Mountains in the 1850s at Cajon, Jurupa, and Rancho del Chino (Beck and Haase 1974).

In the 1860s prospectors fanned out over the Mojave Desert looking for another Sutter’s Mill or Comstock Lode, resulting in the discovery of ore in the Clark Mountain Range, and in the Providence, New York, Whipple, Turtle, and Sacramento Mountains, as well as important silver deposits near Tecopa Pass. Most of these discoveries were made within two days’ travel of major transportation routes. Between 1870 and World War I, mining activity continued and gold mining surpassed silver mining in the 1890s.

Precious metals were not the only commodity that was mined near the turn of the twentieth century. Large deposits of borates were discovered in the Calico area (Borate) and in and around Death Valley. Nitre was mined 15–20 miles north of the proposed project area near the turn of the twentieth century, as were gypsum and talc (Vredenburgh, Shumway, and Hartill 1981).

Railroads

By the beginning of the twentieth century, mining interests in the Amargosa Basin saw a need to provide better transportation for minerals and ore to the markets. Rail transportation along the Old Government Road (Mojave Road) had been open since 1883 with the completion of the Atlantic and Pacific Line (Santa Fe Railroad). By 1905 a second rail line bisected the Mojave Desert with the construction of the San Pedro, Los

Angeles, and Salt Lake Line (Union Pacific). William T. Coleman of San Francisco had developed the Harmony Borax Works using 20-mule teams to haul the deposits across the Mojave to the town of Mojave on the Southern Pacific Railroad.

In 1888 Coleman's borax properties, the Lila C. and the mines at Borate (Calico), passed to Francis M. "Borax" Smith who had found borates at Teel's Marsh in Nevada. In 1890 Smith combined all three properties to form the Pacific Coast Borax Company. Exhausting the supply at Teel's March, Smith moved operations to Calico. By 1900 the rich deposits at Calico began to give out, and Smith turned his attention to his property near Death Valley.

After a failed attempt in April 1904 to move his ore from the Lila C. mine near Death Valley to the California Eastern Railroad at Ivanpah, 100 miles to the south, via a rock-base wagon road, Smith conceived of a new railroad bisecting the Mojave Desert north to south. On July 19, 1904, he incorporated the Tonapah and Tidewater Railroad Company. Surveys were conducted for several alternate routes, and contracts were arranged. Following conversation with Montana Senator William A. Clark in Nevada, a route was chosen between Las Vegas and the Lila C. The construction of the railroad started in Las Vegas in the spring of 1905. By August it became clear that Senator Clark was building his own railroad to the Tonapah-Goldfield area to provide rail transportation for the newly found gold and silver mines in that area.

After talks with the Santa Fe Railroad, Smith altered his route, and by the latter part of 1905 a tent city had been established at Ludlow to begin the new railroad which was planned to extend 167 miles north to the goldfields, with a branch line cutting over to the Lila C. Smith envisioned a railroad from Tonapah, Nevada, to the tidewater at San Diego, hence the name. On November 19, 1905, the first tracks were laid on the T&T's loop out of Ludlow, and by May of 1906 the rail line extended for 75 miles to just beyond Dumont. Engineering problems slowed construction to Tecopa (Inyo County) due to the twelve mile Amargosa Canyon segment, but a year later trains were operating all the way to Tecopa. In June 1907 the rail line extended to Zabriskie, where wagon-hauled ore from the Lila C. was loaded for the 91-mile trip to Ludlow. Eighteen additional miles were completed to Evelyn by mid-July of that year. On August 16, 1907, the seven-mile branch line from the Lila C. connected with the T&T at Death Valley Junction. Additional construction extended the T&T to Gold Center, Nevada, the end of the line, on October 30, 1907. Smith made arrangements with the recently completed Bullfrog Goldfield Railroad to connect to the T&T and to use the Bullfrog track from Gold Center, north to Beatty, and west to Bullfrog and Rhyolite.

A spur line was constructed to China Ranch to facilitate gypsum and talc shipping in 1915 in the Willow Wash or China Ranch Wash. The T&T railroad was abandoned in 1940 when the rails were removed to support the war effort. Many of the ties were taken to Barstow and used in the construction of the El Rancho Motel (Myrick 1992). An unconfirmed report by Pat Mitchell (1994, personal communication), grazing allottee at Horse Thief Springs, indicates that the railroad tie-constructed cabin or house at Horse Thief Springs was also built of T&T railroad ties.

Hydroelectric Power Generation and Electric Power Transmission

The eastern Mojave Desert has been the major corridor for the transmission of hydroelectric power from Hoover Dam, roughly 51 miles to the northeast of the project site, to Los Angeles, approximately 244 miles to the southwest, since 1936. Hoover Dam and the electric transmission system that distributes the hydroelectric power that it produces underwrote much of the economic development of the West in the twentieth century and were particularly critical to the economic development of southern California during that period (Solar Partners I et al. 2008f:6).

Hoover Dam

Congress authorized the construction of Hoover Dam through the passage of the Boulder Canyon Project Act of 1928. The act was a response to both an increase in the regional demand for electric power and a desire to affect better flood control along the Colorado River. Construction of the dam began in 1931, and the dam structure itself was completed in 1935. The construction of the hydroelectric powerhouse and the installation of the first turbines took another year. The powerhouse went into operation in 1936. The installation of the balance of the turbines in the facility was completed in 1939. The original output of the powerhouse in 1939 was 700 MW, making it the largest hydroelectric facility in the world at that time (Solar Partners I et al. 2008f:5 and 6).

Hoover Dam Transmission System

Transmission systems were needed to power the construction of Hoover Dam and to distribute the hydroelectricity that it would ultimately generate. The design of the Boulder Canyon Project Act was for the Federal government to build the dam and the powerhouse and to supply the turbines. Power contractors were then to lease the turbines from the government, pay the government for the use of the pooled water, and to themselves supply the electric transmission lines for the distribution of the generated electricity. The government, however, first had to supply a transmission line to power the construction of the dam. Southern Sierras Power Company, subsequently the California Electric Power Company, won the contract to build that initial transmission line and did so in 1930 and 1931. A second contractor, the Interstate Telegraph Company, built a telephone line in 1931 that was necessary to the operation of the Southern Sierras Power Company transmission line. The California Electric Power Company reversed the direction of the transmission line in 1937 to begin delivery of electricity from Hoover Dam to the City of San Bernardino (Solar Partners I et al. 2008f:6 and 7).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Regulatory Context

Various laws apply to the evaluation and treatment of cultural resources. CEQA requires the Energy Commission to evaluate resources by determining whether they meet several sets of specified criteria as NHPA requires the BLM to evaluate resources for

eligibility for listing on the NHRP. These evaluations then influence the analysis of potential impacts to the resources and the mitigation that may be required to ameliorate any such impacts.

The CEQA Guidelines provide a definition of a historical resource as a "resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the CRHR", or "a resource listed in a local register of historical resources or identified as significant in a historical resource survey meeting the requirements of Section 5024.1 (g) of the Public Resources Code," or "any object , building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the agency's determination is supported by substantial evidence in light of the whole record." (California Code of Regulations, Title 14, section 15064.5(a)). Historical resources that are automatically listed in the CRHR include California historical resources listed in or formally determined eligible for the NRHP and California Registered Historical Landmarks from No. 770 onward (Public Resources Code, Section 5024.1(d)).

Under the CEQA Guidelines, a resource is generally considered to be historically significant if it meets the criteria for listing in the CRHR. These criteria are essentially the same as the eligibility criteria for the NRHP. In addition to being at least 50 years old,[8] a resource must meet at least one (and may meet more than one) of the following four criteria (Public Resources Code section 5024.1):

- Criterion 1, is associated with events that have made a significant contribution to the broad patterns of our history;
- Criterion 2, is associated with the lives of persons significant in our past;
- Criterion 3, embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values; or
- Criterion 4, has yielded, or may be likely to yield, information important to history or prehistory.

In addition, historical resources must also possess integrity of location, design, setting, materials, workmanship, feeling, and association (California Code of Regulations, Title 14, section 4852(c)).

Even if a resource is not listed or determined to be eligible for listing in the CRHR, CEQA allows the lead agency to make a determination as to whether the resource is a historical resource as defined in Public Resources Code sections 5020.1 (j) or 5024.1. Whether a proposed project would cause a substantial adverse change in the significance of historical resources is the issue that staff analyzes to determine if the project may have a significant effect on the environment. The significance of an impact depends on:

[8] The Office of Historic Preservation's Instructions for Recording Historical Resources (1995) endorses recording and evaluating resources over 45 years of age to accommodate a five-year lag in the planning process.

- The cultural resource impacted;
- The nature of the resource's historical significance;
- How the resource's historical significance is manifested physically and perceptually;
- Appraisals of those aspects of the resource's integrity that figure importantly in the manifestation of the resource's historical significance; and
- How much the impact will change those integrity appraisals.

Historical Resources Inventory

The development of the inventory of historical resources in and near the proposed project area is the requisite first step in the assessment of whether the project may, under Public Resources Code section 21084.1, cause a substantial adverse change in the significance of a historical resource, and may, therefore, have a significant effect on the environment. The effort to develop the inventory has involved conducting a sequence of investigatory phases that includes doing background research, consulting with local Native American communities, conducting primary field research, interpreting the results of the inventory effort, as a whole, and evaluating whether found cultural resources are historically significant. This section discusses the methods and the results of each inventory phase, develops the historical resources inventory for the analysis of the proposed project, and interprets the inventory to assess how well it represents the archaeology of the project area of analysis.

The project area of analysis is the geographic area in which the construction and operation of the proposed project may have the potential to directly and indirectly impact cultural resources. For the purpose of the present analysis, this geographic area includes the project site, which is the footprint of the concentrating solar power electric generation facility, the broader project area, which is the area that encompasses the project site and ancillary facilities, such as natural gas pipelines, water pipelines, transmission infrastructure, and access roads requisite to the operation of the generation facility, and areas beyond the project area where the project may visually intrude on cultural resources.

Background Research

The background research for the present analysis employs information that the applicant and the BLM gathered from literature and record searches, and information that the BLM and Energy Commission staff gathered as a result of consultation with local Native American communities and with other potential public interest groups. The purpose of the background information is to help formulate the initial cultural resources inventory for the present analysis, to identify information gaps, and to inform the design and the interpretation of the field research that will serve to complete the inventory.

Literature and Records Search

The literature and records search portion of the background research attempts to gather and interpret documentary evidence of the known cultural resources in the project area of analysis. The sources for the present search include the San Bernardo Archeological

Information Center (SBAIC) of the California Historical Resources Information System (CHRIS), and the BLM Needles Field Office.

CHRIS Search

Methods

CH2M HILL, the cultural resources consultant to the applicant, requested a records search from the SBAIC on June 21, 2007 (BSE2007a, App. 5-3C). The record search was limited to the area within a one-mile radius around the project site and 0.25 miles to each side of the linear infrastructure proposed for the project. The search returned information on the known inventory of prehistoric and historical archaeological resources, built-environment resources, cultural landscapes, traditional cultural resources, and the heritage resources for which designations of significance already exist, that fell within the defined search area. The search also provided information on the technical reports for the previous archaeological surveys that have taken place wholly or partly within 0.25 miles of the area subject to archaeological survey for the present analysis, and for the archaeological excavations and built-environment surveys that have taken place in the records search area. The CHRIS records search also accessed the *Survey of Surveys: A Summary of California's Historical and Architectural Resource Surveys* (1986), the *Five Views: An Ethnic Sites Survey for California* (1988), the listed California Historical Landmarks and California Points of Historical Interest, and the California Office of Historic Preservation's Determinations of Eligibility and Directory of Historic Properties.

Results

The SBAIC record search found that 21 investigations, 20 pedestrian surveys, and one ethnographic study, had been wholly or partially conducted in the record search area between 1978 and 1995 (Cultural Resources Table 2).

CULTURAL RESOURCES TABLE 2
Previous Cultural Resources Investigations in the Records Search Area

Type of Investigation	Number of Investigations of Type	Dates of Investigations	CHRIS Document Nos.
Linear pedestrian electric transmission line surveys	8	Late 1970s to mid-1990s	1060614, 1060763, 1060764, 1060874, 1061280, 1061479, 1062170, 1063668
Areal pedestrian survey to inventory California desert area archaeological site types	1	Late 1970s	1062218
Linear and areal pedestrian surveys for the ISEGS project	2	Early 1980s	1061156, 1061219
Ethnographic Study for the ISEGS project	1	Early 1980s	1061220
Linear pedestrian motorcycle race course survey	1	Early 1980s	1061381
Linear and areal pedestrian surveys for drilling areas and associated access roads	2	Mid-1980s	1061599, 1061605
Areal pedestrian parcel surveys	2	Mid-1980s	1061602, 1061612
Linear pedestrian fiber optic cable surveys	2	Late 1980s	1061613, 1061734
Linear pedestrian natural gas pipeline surveys	2	Late 1980s to early 1990s	1062211, 1062571

The total survey coverage in the project area that is the result of these previous investigations is roughly 242 acres or 6 percent.

While eight cultural resources are known for the record search area (Cultural Resources Table 3), only one is located in the project area of analysis, the Hoover Dam-to-San Bernardino Transmission Line (CA-SBR-10315H), originally built as a 132-kV line and presently operating as a 115-kV line.

CULTURAL RESOURCES TABLE 3
Previously Recorded Cultural Resources in the Records Search Area

Resource Designation No.	Description	Approximate Distance and Direction to Project Area
CA-SBR-816, 2341	Rock shelter	1.0 miles NW of Ivanpah No. 3
CA-SBR-2342	Rock shelter	1.0 miles NW of Ivanpah No. 3
CA-SBR-6956	Rock shelters and milling features	0.85 miles NW of Ivanpah No. 3
CA-SBR-7347H	Dirt road, two-track with low side berms	0.5 miles WSW of Ivanpah No. 1
CA-SBR-7689H	Arrowhead Trail Highway (State Route 31)	0.6 miles E of Ivanpah No. 1
CA-SBR-7694H	Boulder Transmission Lines 1, 2, and 3	0.8 miles N of Ivanpah No. 3
CA-SBR-10315H	Original 132-kV transmission line from the City of San Bernardino to the Hoover Dam, now known as the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115-kV transmission line	Between Ivanpah No. 1 and Ivanpah No. 2
CA-SBR-10803H	Stock-loading facility with ancillary improvements	0.5 miles E of Ivanpah No. 1

BLM Needles Field Office National Environmental Policy Act (NEPA) Document

Document Origins and Purpose

The BLM Needles Field Office has a NEPA document on file, an Environmental Assessment (EA), for the recent renewal of the Clark Mountain grazing allotment that is useful to the present analysis (BLM 2007). The Clark Mountain allotment includes 97,848 acres of public land across a number of different environmental zones in Ivanpah and Mesquite Valleys in San Bernardino County, and encompasses the proposed project area.

The EA provides important information on the distribution of cultural resources beyond the one major environmental zone of the project area, mid-slope bajada with Mojave Creosote Bush Scrub. The cultural resources inventory in the EA for the Clark Mountain allotment offers a broader context of the different types of archaeological sites that reflect the variations in the prehistoric human use of the different environmental zones in the project vicinity through time, of the potential for shifts in the composition of archaeological site types across the project area bajada over the last 12,000 years as part of the human response to fluctuations in the climate of the region, and of the range of historical archaeological sites that may be found in the area of analysis for the project.

Results

The cultural resources inventory for the Clark Mountain allotment in the EA is primarily the result of sporadic pedestrian surveys that have taken place over the last 30 years. Approximately 2,661 acres of the 97,848 acres of public land in the allotment, or 2.7 percent, have been subject to survey. The result of the work has been the identification of 46 cultural resources (Cultural Resources Table 4).

The EA splits out the cultural resources inventory of the allotment relative to three major environmental zones, mountain ranges, valley floors, and zones of transition between the mountain ranges and valley floors. The Mountain Environmental Zone in Cultural Resources Table 4 relates solely to the mountain ranges proper in the allotment, the Clark Mountain Range and the Mesquite Mountains. The Valley Environmental Zone includes the alluvial and eolian landforms on or near the floors of Ivanpah and Mesquite Valleys and the inselbergs along the margins of the valleys. The Transition Environmental Zone covers the lower slopes of the mountains, the adjacent upper portions of local bajadas, and the canyons and springs that are found at that physiographic interface.

CULTURAL RESOURCES TABLE 4
Clark Mountain Allotment Cultural Resources Inventory

CHRIS Trinomial	Environmental Zone	Site Type
Prehistoric Archaeological Resources		
CA-SBR-817	Mountain (hillside)	Campsite
CA-SBR-7348	Mountain	Lithic scatter
CA-SBR-816	Mountain (hillside)	Rock shelter
CA-SBR-840	Mountain (hillside)	Rock shelters
CA-SBR-2342	Mountain (hillside)	Rock shelter (habitation)
CA-SBR-807	Transition	Roasting pits[9]
CA-SBR-809	Transition	Roasting pit
CA-SBR-838	Transition	Roasting pits
CA-SBR-859	Transition	Roasting pit
CA-SBR-2335	Transition	Rock shelter, small
CA-SBR-2395	Transition	Roasting pit
CA-SBR-5120	Transition	Roasting pits
CA-SBR-5317	Transition	Rock shelter
CA-SBR-7392	Transition	Campsite, temporary
CA-SBR-2969	Valley	Campsite
CA-SBR-2970	Valley	Campsite
CA-SBR-2971	Valley	Campsite
CA-SBR-4944	Valley (private land)	Campsite
CA-SBR-2791	Valley	Campsite, temporary
CA-SBR-5222	Valley	Campsite, temporary
CA-SBR-5439	Valley	Campsite, temporary
CA-SBR-5440	Valley	Campsite, temporary
CA-SBR-5223	Valley	Ceramic scatter, small
CA-SBR-3727	Valley	Lithic scatter
CA-SBR-5224	Valley	Lithic scatter, small
CA-SBR-6955	Valley	Lithic scatter
CA-SBR-4920	Valley	Trail
Historical Archaeological Resources		
CA-SBR-6835H	Mountain/ Transition/Valley	Von Schmidt 1872 Boundary Survey for California and Nevada
CA-SBR-7694H	Mountain/	Boulder Transmission

[9] "Roasting pits" here, also known as "ring midden roasting pits," are "elevated ring-shaped piles composed of stone and soil" that are commonly thought to derive from repeated episodes of roasting mescal (*Agave* spp.) or sotol (*Dasylirion* spp.). These archaeological features are most often found in the deserts of the Southwest (Kroesen and Schneider 2008, pp. 43 and 44).

CHRIS Trinomial	Environmental Zone	Site Type
	Transition/Valley	Corridor right-of-way
CA-SBR-9740[H]	Mountain	Historic mining
CA-SBR-6563H	Transition	Historic trash scatter
CA-SBR-6591H	Transition	Historic trash scatter
CA-SBR-10803H	Valley	Cattle corral
CA-SBR-10315H	Valley	Electric transmission line
CA-SBR-7347H	Valley	Historic road
CA-SBR-7689H	Valley	Historic road
CA-SBR-10802H	Valley	Historic road
CA-SBR-10806H	Valley	Historic road
CA-SBR-5221[H]	Valley	Historic salt works
CA-SBR-10804H	Valley	Historic site
CA-SBR-4701[H]	Valley	Historic stone walls
CA-SBR-6248H	Valley	Historic trash scatter
CA-SBR-6592H	Valley	Historic trash scatter
CA-SBR-6957H	Valley	Historic trash scatter
CA-SBR-6562H	Valley	Telegraph station
Dual-Component Archaeological Resource		
CA-SBR7098/H	Valley	Lithic scatter/historic trash scatter

The cultural resources inventory for the Clark Mountain allotment demonstrates distinct patterns for the prehistoric and historic human use of the environmental zones above, in, and below the proposed project area (Cultural Resources Table 5). The evidence for the prehistoric use of the Mountain Environmental Zone includes rock shelters, an open campsite, and a lithic scatter. The inventory for the Transition Environmental Zone in the allotment similarly includes a small rockshelter and a temporary open campsite, but is the only environmental zone in the allotment where roasting pits are found. The Valley Environmental Zone has the highest frequency of prehistoric archaeological sites. The Valley cultural resources inventory includes open temporary campsites and campsites that evidence more enduring use, scatters of lithic and ceramic artifacts, and a trail.

CULTURAL RESOURCES TABLE 5
Clark Mountain Allotment Cultural Resources Types and Environmental Zones

Archaeological Site Type	**Environmental Zone**		
	Mountain	**Transition**	**Valley**
Prehistoric Archaeological Sites			
Campsite	1	1	8
Ceramic scatter			1
Lithic scatter	1		3
Rock art			
Rock shelter	3	2	
Roasting pit		6	
Trail			1
Total (Number/Percent)	5/19%	9/33%	13/48%
Historical Archaeological Sites			
Cattle corral			1
Electric transmission line	1	1	2
Historic mining	1		
Historic road			4
Historic salt works			1
Historic site			1
Historic stone wall			1
Historic trash scatter		2	3
Land surveying boundary	1	1	1
Telegraph station			1
Total (Number/Percent)	3/14%	4/18%	15/68%

The evidence for the historic human use of the environmental zones in the vicinity of the project area exhibits markedly different patterns of activity from those characteristic of the prehistoric period. The Mountain Environmental Zone has been the focus of mining in the historic period and is represented in the cultural resources inventory for the Clark Mountain allotment by CA-SBR-9740[H]. Over time, intermittent stream flow has flushed historic refuse from the mines in the Clark Mountain Range and the Mesquite Mountains down into the Transition Environmental Zone where deposits of this refuse sporadically line the streambeds and banks of dry washes. The Valley Environmental Zone has been the focus of a more diverse range of uses in the historic period. The historic-period resources inventory for the Valley Environmental Zone includes evidence of livestock management and the development of electric transmission and transportation corridors, communications infrastructure, and manufacturing enterprises. The historic trash scatters, stone wall configurations, and the nondescript historic site are evidence of the more peripheral aspects of the range of historic activity out on the floors of Ivanpah and Mesquite Valleys.

Native American Consultation

The applicant, the BLM, and Energy Commission staff have undertaken to consult with the Native American groups that may have an interest in the project area, beginning with the applicant in June, 2007. The BLM, as the local federal land manager, is coordinating the ongoing Native American consultation for the proposed project on its own behalf and on behalf of the Energy Commission. The results of that consultation, to date, are found here.

Methods

CH2M HILL, the consultant to the applicant, contacted the California Native American Heritage Commission (NAHC) on June 27, 2007 to request that the NAHC search its Sacred Lands File to determine whether there are any reported Native American cultural resources in the project area of analysis, and to request that the NAHC provide a list of Native American contacts that may have knowledge of cultural resources in that area. On June 29, 2007, CH2M HILL, on the basis of the response from the NAHC, sent out letters to initiate correspondence with the Native American groups that the NAHC thought may have an interest in the project area (BSE2007a, p. 5.3-21 and appendix 5.3A; Cultural Resources Table 6).

The BLM has also sought to engage Native American groups beyond those on the NAHC contact list that the agency believes may have an interest in the lands in the project area of analysis and with which the agency maintains ongoing relationships (Cultural Resources Table 7). BLM Needles Field Office staff sent out letters initiating consultation with potentially affected tribes on October 4, 2007. On December 6, 2007, BLM submitted additional letters to the balance of the groups that the NAHC thought may have an interest in the project area. The purpose of the BLM letters was to initiate formal Federal contact with Native American groups about the proposed project and to initiate government-to-government consultation with those groups that are federally recognized. BLM Needles Field Office staff sent out a subsequent letter on March 5, 2009 to the recipients of its initial letter to inform them of the discovery of ISEGS-01, an archaeological site to the east of the project site (see “May 23, 2008 Pedestrian Reconnaissance Survey of Project Area Inselbergs” and “Investigation to Evaluate Archaeological Site ISEGS-01” subsections, below), to solicit input on and concerns about the new archaeological site, request information on any cultural or religious values that might be affected by the proposed project, and to inform them that the results of additional archaeological survey on the hills that flank the project site would be made available to them on request.

Results

The June 29, 2007 response of the NAHC to the above request says that the Sacred Lands File did not indicate any Native American cultural resources in the immediate project area and provides a list of Native American contacts (Cultural Resources Table 6). CH2M HILL mailed and emailed letters to each of the contacts on the June 29 list asking them to please contact the consultant if they had any knowledge of traditional cultural properties or areas of traditional cultural value in the project area, or if they had any concerns about the proposed project. As of August 13, 2007, the month of the filing

of the AFC for the proposed project, CH2M HILL had received no responses to the letters sent out on June 29 (BSE2007a, p. 5.3-21 and appendix 5.3A).

As of October, 2009, BLM Needles Field Office staff has had no response from any of the Native American groups to either round of correspondence. BLM Native American consultation efforts are ongoing.

CULTURAL RESOURCES TABLE 6 (BSE2007a, Appendix 5.3A)
NAHC Native American Contact List

Native American Group	Location of Group Contact	Federal Recognition
Cahuilla Band of Mission Indians of the Cahuilla Reservation	Community of Anza, Riverside County	Yes
Ramona Band of Cahuilla Mission Indians of California	Community of Anza, Riverside County	Yes
San Manuel Band of Serrano Mission Indians of the San Manuel Reservation	City of Highland, San Bernardino County	Yes
Chemehuevi Indian Tribe of the Chemehuevi Reservation	Chemehuevi Valley, San Bernardino County	Yes
AhaMaKav Cultural Society, Fort Mojave Indian Tribe	Mohave Valley, Mohave County, Arizona	n/a
Morongo Band of Cahuilla Mission Indians of the Morongo Reservation	City of Banning, Riverside County	Yes
Fort Mojave Indian Tribe of Arizona, California, and Nevada	City of Needles, San Bernardino County	Yes
Serrano Nation of Indians	City of Highland, San Bernardino County	No
San Fernando Band of Mission Indians	Community of Newhall, Los Angeles County	No

CULTURAL RESOURCES TABLE 7
BLM Needles Field Office List of Additional Native American Contacts

Native American Group	Location of Group Contact	Federal Recognition
Colorado River Indian Tribes of the Colorado River Indian Reservation	City of Parker, La Paz County, Arizona	Yes
Las Vegas Tribe of Paiute Indians of the Las Vegas Indian Colony	City of Las Vegas, Clark County, Nevada	Yes
Pahrump Paiute Tribe	Town of Pahrump, Nye County, Nevada	No

Consultation with Others

CH2M HILL made telephone calls to the San Bernardino Historical and Pioneer Society in the City of San Bernardino on June 27, 2007, in an attempt to reach Steve Shaw, President, and to the Nevada State Museum and Historical Society in Las Vegas on June 28, 2007, in an attempt to reach David Millman, Curator of Collections (History). Voicemails were left for both. As of August 13, 2007, the month of the filing of the AFC for the proposed project, CH2M HILL had received no responses (BSE2007a, p. 5.3-19).

Cultural Resources Distribution Models

One critical use of the information drawn together during the background research for a cultural resources analysis is to inform the design and the interpretation of the field research that will complete the cultural resources inventory for the analysis. The background research for the present analysis has identified one previously recorded cultural resource on the project site, CA-SBR-10315H (see *California Historical Resources Information System Search* subsection above), and found that roughly 94 percent of the project area has never been subject to cultural resources survey. A further role of background research is to help develop predictive or anticipatory models of the distribution of cultural resources across a project area of analysis. Such models of the types of archaeological, ethnographic, and built-environment resources, and the patterns of their distribution across and beneath the surface of the landforms of the project area of analysis, provide the means to tailor more appropriate research designs for the field investigations that will complete a cultural resources inventory, and help gauge the degree to which the results of those investigations may reflect the actual population of archaeological, ethnographic, and built-environment resources in the project area of analysis. Such models also provide important contexts for the ultimate interpretation of the results of those investigations.

Models of the distribution of prehistoric archaeological sites, of ethnographic resources, and of historical archaeological sites and built-environment resources are developed here and draw on information above in the “Environmental Setting,” “Prehistoric Setting,” “Ethnographic Setting,” and “Historic Setting” subsections, in addition to the above information in the “Background Research” subsection. Staff formulated data requests during the discovery phase of the present certification process on the basis these models to ensure the collection of enough information to factually support the conclusions of this analysis. The discussions in the “Interpretation of Results” subsection below also employ the models.

Model of Prehistoric Archaeological Resources

The analysis of the information in the “Environmental Setting,” “Prehistoric Setting,” and “Literature and Records Search” subsections leads to the conclusion that subsurface prehistoric archaeological deposits are unlikely to be present in the project area and that the likelihood of prehistoric archaeological deposits across the surface of the project area is generally low, with the possible exception that roasting pits and rock shelters could be present on the inselbergs adjacent to the project site.

The age of the constituent sedimentary deposits that make up the project area landform, the bajada, and the geomorphic processes that have been actively shaping it constrain the age and the physical integrity of the surface and subsurface archaeological deposits that may be present there. The subsurface portion of the bajada appears to have been formed between approximately 8,700 and 4,000 years ago. Processes of erosion appear to have been reworking the sedimentary deposits of the bajada over the course of the last 4,000 years (see “Historical Geomorphology” subsection, above).

Subsurface archaeological deposits that may be present in the project area would include cultural materials from the time range of 8,700 to 4,000 years ago that would

have been left on former bajada surfaces and then buried during the most recent cycle of sedimentary deposition on the middle and lower slopes of the bajada. This time range corresponds to the late Lake Mojave Period (10,000 to 5000 B.C.) and the Pinto Period (5000 to 2000 B.C.) (see “Prehistoric Setting” subsection, above). Lake Mojave and Pinto Period deposits are typically small, rather sparse accumulations of stone tools and stone tool manufacturing debris that are found in the vicinity of high terraces above or on relict shorelines along what are now playas. The portions of archaeological sites or components that date to this time range and largely represent temporary small camps and work stations are also found along relict stream channels. As the terraces and shorelines of Ivanpah Dry Lake are lower down on the bajada beneath the proposed project area, and as the ephemeral washes that course over the present surface of the project area are not the type of relict stream channels that would have held more perennial water sources in prehistory, the presence of subsurface Lake Mojave and Pinto Period archaeological deposits in the project is unlikely.

Archaeological deposits that may be present on the surface of the proposed project area would include cultural materials that date from 4,000 years ago to the present. Deposits of this age may survive with physical integrity on the more stable patches of the surface of the bajada, or have no physical integrity due to the erosion and re-deposition of the original deposits in ephemeral stream channels and over the adjacent channel banks. The time range for most surface archaeological manifestations would correspond to the Gypsum (2000 B.C. to A.D. 500), Saratoga Springs (A.D. 500 to 1200), and Protohistoric (A.D. 1200 to present) Periods. Gypsum Period components are ephemeral in character and are relatively scarcer in the vicinity of the project area. The basic settlement pattern from the Gypsum through the Protohistoric Period appears to demonstrate a focus on lowland concentrations of plant resources along streams and in the lake basins. Despite considerable evidence of outside (Virgin Anasazi and Hakataya) influence in the region during the Sarasota and Protohistoric Periods, the basic economic milieu and the associated settlement patterns reflect the ongoing local trends in desert adaptation that had been in place for millennia. As the stream and lake basin environments that would have been conducive to the development of plant resource concentrations in the Gypsum through Protohistoric Periods do not appear to have been present in the project area, modern vegetation associations having been in place by approximately 4,500 years ago (see “Paleoecology” subsection above), the presence of period surface deposits is unlikely.

The results of the CHRIS records search and the EA for the Clark Mountain allotment differ in their support of the above conclusions. The records search notes three prehistoric archaeological sites in the vicinity of the proposed project area, CA-SBR-816 (-2341), CA-SBR-2342, and CA-SBR-6956, and none in it. The three sites are rock shelters, one of which includes milling features, which lie approximately 0.85 to 1.0 miles to the northwest and approximately 160 feet above the project area at the base of the Clark Mountain Range. The project area encompasses the lower portion of what the EA for the Clark Mountain allotment delimits as the Transition Zone and the upper portion of the Valley Zone in that classification. On the basis of the results of the EA, the prehistoric archaeological record for the project area may include roasting pits, rockshelters, and campsites in the Transition Zone and campsites, lithic and ceramic scatters, and trails in the Valley Zone. The question of how many of these different site

types may be found in the project area is dependent upon where in the Transition and Valley Zones the different types cluster. The project area, being on the broad bajada slopes in the lower portion of the Transition Zone appears to be just beneath the lower mountain slopes and the upper bajada surfaces, where the surface presence of the roasting pits and the rockshelters appear to cluster (Kroesen and Schneider 1991, p. 50). Topographic exceptions are the inselbergs that flank the Ivanpah No. 3 portion of the project site, which may have geologic formations that would accommodate rockshelters and may host vegetation types that include the plant species that were being processed in the roasting pits. The site types characteristic of the Valley Zone typically cluster down on the valley floor in the vicinity of Ivanpah Dry Lake (BLM 2007), below the project area. As the project site is in the upper portion of the Valley Zone, the frequency of the Valley Zone site types may be rather low.

Model of Ethnographic Resources

The available information on the types of ethnographic resources that would be or are characteristic of the Southern Paiute or Mojave groups are too general and too spare to develop a useful predictive model about the resources that may be present in the project area of analysis. The study by Bean, Vale, and Young (1982) indicates that, in the vicinity of the proposed project area, known ethnographic areas of value include playa edges such as those around Ivanpah Dry Lake, grinding rock and roasting pit sites at Mountain Pass roughly eight miles to the southwest of the project site, piñon stands in the New York Mountains on the southeastern margin of Ivanpah Valley, and turquoise deposits in the Clark Mountain Range and in the vicinity of Turquoise Mountain roughly 30 miles to the west-southwest of the project site (Bean, Vale, and Young 1982:6-6–6-39). The identification of ethnographic resources for the present analysis must rely on efforts to identify ethnographic resources in the field and on further Native American consultation.

Model of Historical Archaeological and Built-Environment Resources

The analysis of the information in the “Environmental Setting,” “Historic Setting,” and “Literature and Records Search” subsections leads to the conclusion that subsurface historical archaeological deposits are most likely not present in the project area and that historical archaeological deposits and built-environment resources are likely present in low to moderate frequency across the surface of the project area.

As the subsurface portion of the bajada is 8,700 to 4,000 years of age and the surface of it has been subject to erosive forces for the last 4,000 years (see “Historical Geomorphology” subsection, above), there is almost no chance that buried historical archaeological deposits exist in the project area that are not detectable from the surface. Constructed subsurface features, such as basements, cellars, and trash and privy pits, would have been dug into the eroding surface of the bajada and would still be apparent today.

Historical archaeological deposits and built-environment resources that may be present on the surface of the proposed project area could hypothetically include cultural materials that date from the mid-nineteenth century to the present, the principal period of the historic use of the project area (see “Historic Setting” subsection, above). Historical archaeological deposits would be present with physical integrity on the more

stable patches of the surface of the bajada or have no physical integrity due to the erosion and re-deposition of the original deposits in ephemeral stream channels and over the adjacent channel banks. Surface deposits of historical archaeological materials that retain physical integrity, or primary deposits, would most likely relate to debris that was the result of the moderately heavy use of transportation routes from the floor of Ivanpah Valley to the mines in the Clark Mountain Range, to the west of the project area, and of transportation routes through the valley, parallel to its long axis. Evidence of such materials and of the actual transportation routes are moderately likely to be present in the project area, as are secondary deposits (deposits that lack physical integrity) of mining-related refuse that has washed down from the mountains and that now lie in and adjacent to ephemeral stream channels. Other historical archaeological materials and built-environment resources that may be present at lower frequency include resources related to ranching, homesteading, local industry, and the development of the utility infrastructure of the region.

The results of the CHRIS records search and the EA for the Clark Mountain allotment support the above conclusion. The records search notes five historical archaeological sites and built-environment resources in the vicinity of the proposed project area, including one that falls inside it (CA-SBR-10315H). These resources include a segment of a dirt road (CA-SBR-7347H), a segment of former State Route 31, or the Arrowhead Trail Highway (CA-SBR-7689H), portions of two utility corridors, operational and abandoned (CA-SBR-7694H and CA-SBR-10315H), and a livestock loading facility (CA-SBR-10803H). The EA for the Clark Mountain allotment indicates that the record of historical archaeological sites and built-environment resources in the project area may also include resources related to the development of local industry. The EA further notes the presence of several resource types that may relate to a number of the known historic themes that are germane to the project area. These resource types include nondescript historic sites, stone wall segments, and historic trash scatters. These more generic resource types, particularly the historic trash scatters, are more likely to be found higher in the project area toward the mines of the Clark Mountain Range, lower in the project area toward the floor of the valley, and along the routes of travel and utility corridors that traverse the project area.

Cultural Resources Inventory Fieldwork

The field efforts to identify the cultural resources in the proposed project area of analysis include a geoarchaeology study, two reconnaissance surveys, and two intensive surveys (Cultural Resources Table 8). Three new cultural resources have been found in the project area of analysis, not including the discovery of six isolate resources, and one previously known cultural resource has been re-recorded (Cultural Resources Table 9). On the basis of background research and the results of the field efforts, the total cultural resources inventory for the project area of analysis includes one archaeological resource, no ethnographic resources, and three built-environment resources.

CULTURAL RESOURCES TABLE 8
Cultural Resources Inventory Investigations for the Present Analysis

Investigation Type	Results	Report Reference
Geoarchaeology Study	Conclusion that surface and subsurface potential for archaeological remains is negligible	pp. 9–18, CH2ML2008b
Primary Intensive Pedestrian Cultural Resources Survey	Relocated one built-environment resource; found two new built-environment resources and six isolated artifacts	Fergusson 2007
Supplemental Intensive Pedestrian Cultural Resources Survey	No cultural resources found	Fergusson 2007
May 23, 2008 Pedestrian Reconnaissance Survey of Project Area Inselbergs	One archaeological resource found	Energy Commission staff field notes
September, 2008 Helicopter and Pedestrian Reconnaissance Survey	No Native American traditional use areas found	Helton, Lawson, and Spaulding 2008; Lawson, Helton, and Spaulding 2008

CULTURAL RESOURCES TABLE 9
Present Inventory of Cultural Resources in the Project Area of Analysis

Cultural Resource Type (Year of Initial Recordation)	Description	Location	California Register of Historical Resources Eligibility (CRHR) and National Register of Historic Places (NRHP) Status	Siting Case Report Reference
Historic Built-Environment Resources				
CA-SBR-10315H (1988)	Hoover Dam-to-San Bernardino transmission line, now known as the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115 kV transmission line	Sec. 3, T. 16 N., R. 14 E., Between Ivanpah No. 1 and Ivanpah No. 2	Consensus determination (2S2) as individually eligible for the NRHP (10/22/93), and therefore listed on the CRHR	Fergusson 2007
CA-SBR-12574H (2007)	Dismantled telephone line and dirt road, two -track	Sec. 3 and 4, T. 16 N., R. 14 E., Through NW quadrant of Ivanpah No. 1	See "California Register of Historical Resources Eligibility" subsection, below	Fergusson 2007
CA-SBR-12575H (2007)	Dirt road, faint two-track	Sec. 3, T. 16 N., R. 14 E, Through NW quadrant of Ivanpah No. 1.	See "California Register of Historical Resources Eligibility" subsection, below	Fergusson 2007
Archaeological Resources				
ISEGS-01 (2008)	Complex of dry-stacked masonry features that include apparent terraces, niches, a bench, and a rock platform	Sec. 34, T. 17 N, R. 14 E., E of Ivanpah No. 2	See "California Register of Historical Resources Eligibility" subsection, below	Helton, Lawson, and Spaulding 2008; Lawson, Helton, and Spaulding 2008
Ethnographic Resources				
None				

This subsection discusses the methods and the results of each field inventory phase and interprets the resultant inventory relative to the cultural resources distribution models above to assess how well the inventory represents the archaeology of the project area. Descriptions of each cultural resource in the inventory, evaluations of the eligibility of each resource for inclusion in the CRHR and the NRHP, assessments of project impacts on each known historical resource, consideration of and potential impacts on archaeological resources that may lie buried on the project site, and proposed mitigation measures for significant impacts may be found in the "National Register of Historic Places and California Register of Historical Resources Eligibility" and "Identification and Assessment of Direct Impacts on Built-Environment Resources and Proposed Mitigation" subsections below.

Geoarchaeology Study

Staff made a request to the applicant (Data Request No. 40) to provide information that would facilitate the assessment of the potential for the project to encounter buried archaeological deposits during the construction, operation, maintenance, closure, and decommissioning of the project. The response from the applicant was a geoarchaeology[10] study that, on the basis of background research, spatial analysis, and primary field research, provides a thorough discussion of the historical geomorphology of the project area and an assessment of the likely presence of buried archaeological deposits there.

Methods

Data for the recent study of the geoarchaeology of the proposed project area (CH2ML2008b, pp. 9–18) comes from the use of remote sensing techniques and field observation. The study began with an analysis of satellite imagery of the northern end of Ivanpah Dry Lake to try and discern aspects of the depositional history of the bajada that underlies the project area, as a whole. A high- resolution aerial photograph of the project area was then used to analyze the surface morphology of the bajada and to delimit, on the basis of visual albedo[11], the darker (older) surface areas of the bajada that would not have been subject to more recent erosion. The resultant surface areas were then scored separately for albedo and apparent surface roughness, both being age-dependent attributes. A sample of the remotely delimited surface areas (N = 28) and two younger surface areas were field-inspected to evaluate the accuracy of the remote analysis and to more closely observe the sample surfaces for prehistoric archaeological remains.

Results

The geoarchaeology study (CH2ML2008b, pp. 9–18) concludes that the surface and subsurface prehistoric archaeological potential of the proposed project area, which is on the middle reaches of the Clark Mountain bajada, is negligible. The field inspection of a sample of 28 of the remnant patches of the older bajada surface did not result in the

[10] Geoarchaeology is a subdiscipline of archaeology that uses the techniques and approaches of earth sciences such as geology, geomorphology, sedimentology, pedology, and stratigraphy to identify, investigate, and interpret the history of the human use of present and former landscapes.

[11] The fraction of incident electromagnetic radiation reflected by a surface.

location of any archaeological remains. If buried prehistoric archaeological deposits were a component of the sedimentary matrix of the Clark Mountain bajada, then artifacts would be anticipated to be constituents of the surfaces of the remnant patches. They are not. The surfaces of the remnant patches are clad in what is referred to as desert pavements, accretionary deposits that form over a long period of time where a single layer of clasts is borne upward on a continually accreting layer of wind-blown or eolian silt. A subset of the artifacts that would be present on a hypothetical former surface of the bajada would become incorporated into a desert pavement that slowly developed over that former surface, leaving the balance of the artifacts on the former surface beneath the forming desert pavement. The absence of artifacts on or in the desert pavements of the remnant patches in the present investigation provides objective evidence that buried prehistoric archaeological deposits may be largely absent on the bajada. Further evidence that would appear to support this conclusion is that only three isolate prehistoric artifacts have been found as the result of the pedestrian surveys of the entire project area (see “Pedestrian Surveys” subsection, below). If buried prehistoric archaeological deposits were present in the project area, then, presumably, the artifacts and the sedimentary matrix from such deposits would be eroding out in places and open to observation on the surface of the bajada, what is now known to be an erosional landform. This does not occur.

One ancillary application of the results of the geoarchaeology study is the observation that even portions of the surface of the bajada that are more recent in age than the above remnant patches may have been stable for a while. A subfossil piñon log (*Pinus monophylla*) was found on a more recent bajada surface among recently active ephemeral streams. The log is thought to be anywhere from 1,100–3,400 years old and may date the surface on which it was found to that approximate age. This information and the recent inadvertent discovery of an intact historical archaeological site (Temporary field no. ISEGS-02) approximately 1,700 feet to the east of Ivanpah No. 2 (see “Traditional Cultural Property Reconnaissance Surveys” subsection, below) demonstrates that, although the bajada is subject to a geomorphic regime of net erosion, the landform provides enough stable surface patches to preserve a representative sample of the historical archaeological deposits that would reflect historic activity on the bajada.

Intensive Pedestrian Surveys

Primary Intensive Pedestrian Cultural Resources Survey

The applicant undertook an intensive pedestrian cultural resources survey of the originally proposed project area to comply with the Energy Commission’s siting regulations. The purpose of the survey was to provide information on the location and the character of the cultural resources that may lie on the surface of the project area. The results contribute to the compilation of the cultural resources inventory of the proposed project area.

Methods

CH2M HILL conducted the survey of the project area from April 25 through May 22, 2007, adjusting the survey methods while the survey was in progress. The survey of the majority of Ivanpah No. 1 was done using transects that were 15 meters apart. On the

basis of the field perception that the potential for encountering cultural resources was low due to disturbance from active, braided, ephemeral drainages, the BLM agreed to a request from CH2M HILL to widen the transect interval to 30 meters with the condition that survey areas that had desert pavements or rock outcrops with desert varnish would be examined more intensively. Ivanpah No. 2 and Ivanpah No. 3, and, apparently, the balance of the project area were surveyed under the latter protocol. When cultural resources were found during the survey, the field archaeologists would delimit the surface extent of each resource, plot the resource on a United States Geological Survey (USGS) 7.5-minute topographic quadrangle series map, and acquire global positioning system (GPS) data for the resource using a Trimble Geo XH mapping-grade unit. Additional field recordation efforts for archaeological sites were to photograph artifacts and site features, and to count and classify artifacts, where reasonable. No artifacts were collected during the survey. The archaeologists reported the ground visibility in the project area to have been approximately 90 percent, or excellent.

Results

CH2M HILL found two new cultural resources in the proposed project area (CA-SBR-12574H and CA-SBR-12575H) and six cultural resources isolates in primary depositional contexts. The isolate resources include a horseshoe, two mining prospects, an obsidian flake, an obsidian nodule, and a chert biface. It is of note that the lithic artifacts are of stone types for which there are no sources in Ivanpah Valley or the mountain ranges that form its margins. Historic tin cans, most apparently dating to the late 1800s, were also found in the stream beds and on the banks of nearly every major ephemeral stream in the project area. These artifacts were not recorded as isolate resources, because they were interpreted, in the field, as being the result of secondary re-deposition from upstream mining-related sites in the Clark Mountain Range.

Supplemental Intensive Pedestrian Cultural Resources Survey

Subsequent to the August 31, 2007 filing of the AFC for the proposed project, a number of the components of the project were altered, which resulted in the expansion of the project site. CH2M HILL, the consultant to the applicant, conducted additional intensive pedestrian survey on 371.45 acres to take into account portions of the expanded project site that had not been subject to prior survey.

Methods

Two CH2M HILL field archaeologists conducted the survey of 371.45 acres from April 29 through May 1, 2008, approximately six person- days, walking transects 15 meters apart. The archaeologists used USGS 7.5-minute topographic quadrangle series maps, aerial photographs, and Trimble hand-held GPS units to navigate to survey areas and to help record their observations. The visibility of the ground surface in the survey areas was reported to have been excellent, at approximately 90 percent.

Results

The archaeologists report the complete absence of prehistoric or historic cultural resources in the areas surveyed. They described the surface of the surveyed areas as exhibiting no evidence of modern development. Widespread evidence of bajada flooding events and sheetwash deposition was also noted.

Traditional Cultural Property Reconnaissance Surveys

May 23, 2008 Pedestrian Reconnaissance Survey of Project Area Inselbergs

Staff asked the applicant (Data Request No. 41) to provide information that would facilitate the assessment of the potential for the built project to affect Native American traditional use areas that may be in sight of the project area. The request sought discussions of both known ethnographic resources, and the potential for ethnographic resources that may not yet be known. To fulfill the request, the applicant would have had to more actively research extant ethnographic sources and expand the project area of analysis beyond the minimum requirements in the Energy Commission's siting regulations to include what were then unsurveyed lands surrounding the project site. The applicant's response to the data request was that the AFC already documented requests that the applicant had made of others for information on known Native American traditional use areas. Staff chose to conduct a pedestrian reconnaissance of a portion of the inselbergs in the vicinity of the project site to help develop a reasonable scope for a more specific request to the applicant to conduct an ethnographic field survey for the present analysis. The purpose of the reconnaissance was to acquire a sense of how likely ethnographic resources were to be present on the inselbergs adjacent to the project area, and to acquire a sense of the topography of the Clark Mountain Range foothills, beyond the inselbergs, and the potential for the project to affect any ethnographic resources that may be present there.

Methods

On May 23, 2008, Energy Commission staff Michael McGuirt and Misa Milliron, Energy Commission consultant Susan Sanders, and BLM staff Colin Grant conducted a biological and cultural resources reconnaissance survey of the Paleozoic marine limestone inselberg just to the west of the Ivanpah No. 3 project area boundary. Later in the day, during a brief respite in a rolling series of thunderstorms, the same group, minus Colin Grant, conducted further reconnaissance of the southern portion of the Precambrian metamorphic inselberg complex just to the east of the Ivanpah No. 3 project area boundary.

The reconnaissance entailed a brisk walk-over of the two areas. The group first drove to the northern end of the limestone inselberg and hiked along its single crest to its southern terminus. The smaller group then later hiked out from near the intersection of the Hoover Dam- to- San Bernardino 115- kV Transmission Line (CA-SBR-10315H) and Colosseum Road approximately 0.7 miles to the low hill that is the most southerly extent of the metamorphic inselberg complex. The latter group hiked the crest of the low hill from south to north and then hiked up to the summit of the most southerly crest of the primary inselberg of the complex, before returning to Colosseum Road. Navigation for the reconnaissance was done using a computer-generated TOPO! topographic map and a hand-held Suunto compass. Field notes and digital images made with a Nikon CoolPix P3 camera variably record the observations made on the reconnaissance. Ground surface visibility on both the limestone inselberg and the metamorphic inselberg complex was excellent as they are bedrock formations. Visibility ranged from 90 to 100 percent.

Results

Energy Commission staff found two new archaeological sites as a result of the brief reconnaissance (Temporary field nos. ISEGS-01 and ISEGS-02). Archaeological site ISEGS-02 was found on the way from Colosseum Road to the metamorphic inselberg complex, and, although it falls outside the project area of analysis, a brief description and interpretation of it is given here, because the presence of the site has a bearing on the potential frequency of historical archaeological sites across the middle reaches of the Clark Mountain bajada and on the differential stability of portions of the bajada surface. The discussion of archaeological site ISEGS-01 can be found in the "California Register of Historical Resources Eligibility" subsection below.

ISEGS-02 is a historic trash scatter or refuse deposit that appears to date roughly to the 1890s to 1910s. The site appears to be a discrete, primary deposit, measuring approximately 15–20 feet in diameter. It was found on a bajada surface slightly higher than the ephemeral stream channels nearby that flank it, on a bajada interfluve. The frequency of the artifacts in the deposit is moderate, and the deposit artifact assemblage includes one whole, embossed, manganese-decolorized, beverage bottle, two whole, colorless, wide-mouthed pickle jars with "Heinz" embossments, and many apparent food and evaporated milk tins. The food tins are hole-in-cap cans with apparent lock or folded-edge side seams, flush, stamped can ends, roughly 1–1½-inch-diameter, hand-soldered caps, and hand-soldered cap vents. The evaporated milk tins have flush, stamped can ends and hand-soldered, matchstick filler closures. The deposit, as a whole, appears to represent a single episode or cycle of activity, as multiple points of discard were not apparent. Given the distance of the deposit from any known or apparent roads or trails, or from any known or apparent loci of habitation, and given the apparent age of the deposit, it most likely represents the locus of a temporary campsite.

September, 2008 Helicopter and Pedestrian Reconnaissance Survey

Staff reinitiated discussions with the applicant on Data Request No. 41 at the June 23, 2008 Data Response and Issues Resolution Workshop in Primm, Nevada, and at the July 2, 2008 continuance of that workshop in Sacramento. Staff sought to encourage the applicant to provide information on the potential presence of Native American traditional use areas beyond the project site that would be subject to the direct impact of the stark visual intrusion that the project would impose on any such resources. To demonstrate the potential presence of Native American traditional use areas in sight of the proposed project, staff shared the preliminary results of the May 23, 2008 pedestrian reconnaissance survey of the inselbergs adjacent to the project area as evidence that such use areas may be present. Staff asked at the June 23 workshop that the applicant more formally evaluate the archaeological site that was found as a result of that reconnaissance (ISEGS-01) and that the applicant conduct a pedestrian reconnaissance of the inselbergs adjacent to the project site and along the ridgelines of the toe of approximately eleven of the Clark Mountain Range foothills that overlook the project site. The applicant agreed to the requests at the July 2 continuance of the workshop and asked, in turn, that CEC and BLM staff provide protocols for both the evaluation of ISEGS-01 and the reconnaissance survey. CEC and BLM staff jointly developed them, incorporating a subsequent request by the applicant to integrate the use of a helicopter in the reconnaissance survey. The BLM gave the applicant the "Protocol for Reconnaissance Survey for Native American Traditional Use Areas" and

the “Protocol for the Documentation and Evaluation of Archaeological Site ISEGS-01” on or about July 21, 2008 (CEC2008xx). The applicant produced a preliminary summary of the results of the field efforts for the protocols in a confidential technical memorandum of September 17, 2008 (Helton, Lawson, and Spaulding 2008), which references a forthcoming, more detailed letter report. The latter report (Lawson, Helton, and Spaulding 2008), a second confidential technical memorandum of December 5, 2008, provides the final results of both the reconnaissance survey and the evaluation of ISEGS-01 (see “Evaluation of Archaeological Site ISEGS-01” subsection, below).

Methods

The consultant to the applicant, CH2M HILL, implemented the “Protocol for Reconnaissance Survey for Native American Traditional Use Areas” (Reconnaissance Survey Protocol), making modest adjustments to the “Field Investigation Methods” in the protocol. The purpose of the reconnaissance was to facilitate the rapid field documentation of potential Native American traditional use areas in the portion of the project area of analysis where the proposed project would create direct visual impacts for such resources. The primary focus of the reconnaissance was the identification of archaeological sites, and natural landscape loci where cultural modification is apparent, that may be prehistoric or historic Native American traditional use areas. Archaeological sites and modified landscape loci that are not demonstrably of Native American origin and cannot reasonably be attributed to some manner of ongoing traditional use fall outside of the project area of analysis and further consideration in the present analysis, because direct visual impacts to those resources would not compromise their historic integrity.

The original Reconnaissance Survey Protocol requests that the applicant conduct a helicopter reconnaissance of the crest of each ridgeline in circled areas on a hardcopy map that Energy Commission and BLM staff gave to the applicant at the June 23 workshop. The cited map delimits a total of 12 circular reconnaissance survey areas (Areas 1–10, Limestone Ridge, and Metamorphic Hill, Cultural Resources Figure 1) in an arc from southwest of the project site clockwise to north of the project site, across the toe of the Clark Mountain Range foothills. The protocol requests that the applicant maintain a helicopter skid-to-ground height of approximately 25 feet while conducting the reconnaissance and assess the viability of the use of a helicopter for the reconnaissance of Native American traditional use areas by conducting an initial flyover of ISEGS-01. If ISEGS-01 was not clearly visible from a 25-foot height, then the applicant was to abandon the use of the helicopter and conduct the survey of the ridgelines in the reconnaissance survey areas on foot. If ISEGS-01 was clearly visible from 25 feet, then the applicant was to use the helicopter to survey the subject ridgelines and follow up the helicopter survey with pedestrian surveys of sample areas on several of the ridgelines in the reconnaissance survey areas to verify the accuracy of the results of the helicopter survey. The applicant chose instead to conduct pedestrian surveys of the Limestone Ridge, the Paleozoic marine limestone inselberg just to the west of the Ivanpah No. 3 project site boundary, and the Metamorphic Hill, the Precambrian metamorphic inselberg complex just to the east of the Ivanpah No. 3 project site boundary, and to conduct a helicopter reconnaissance of a sample of the ridgelines in Areas 1–10. In late August, 2008, the applicant, citing the length and the steep grade of many of the ridgelines in Areas 1–10, submitted revised maps of those

survey areas that delimited 22 reconnaissance targets. The reconnaissance targets are a sample of the flatter ridges and of the topographic highs within each survey area that possess unobstructed views of the surrounding terrain (Cultural Resources Figure 1). The applicant requested that Energy Commission and BLM staff agree to restrict the helicopter survey to the 22 reconnaissance targets. Energy Commission and BLM staff agreed to this revision to the original Reconnaissance Survey Protocol. Subsequent to Energy Commission and BLM staff approval of the revision to the protocol, the applicant added a further reconnaissance survey area, Area 11, to the north-northeast of the project site and five new reconnaissance targets, for a total of 27 reconnaissance targets.

The Reconnaissance Survey Protocol also includes methods for the recordation of archaeological deposits found as a result of the survey, “Field Recordation of Archaeological Remains.” The applicant was to complete California Department of Parks and Recreation (DPR) 523A and 523J forms for each archaeological site, and each locus of cultural modification to the natural landscape, found that *may* be a prehistoric or historic Native American traditional use area, record field notes that document descriptions of and GPS coordinates for archaeological sites and loci of natural landscape modification that the applicant does *not* believe are Native American traditional use areas, and record field notes that document descriptions of isolate artifacts and diffuse artifact scatters that collectively make up the low frequency background of the local archaeological record. The purpose of the documentation of archaeological remains and modified landscape loci that are not thought to be of Native American origin is to document the authenticity and accuracy of the results of the reconnaissance, and to provide an empirical archaeological context for the interpretation of the results, whether positive *or* negative.

CH2M HILL archaeologists conducted the pedestrian reconnaissance survey of the Limestone Ridge and the Metamorphic Hill, intermittently, from September 2 through 4, 2008. The archaeologists conducted meandering pedestrian surveys of the crest of the ridge and the topographic highs of the metamorphic rock outcrops that compose the Metamorphic Hill, or the Precambrian metamorphic inselberg complex. Photographs and GPS coordinates were taken of and for archaeological sites and loci of landscape modification that the archaeologists understood as unlikely to be Native American in origin, and of and for other archaeological sites and loci of indeterminate cultural affinity. Field notes on artifacts found in association with such sites or loci were taken. The other field recordation methods of the Reconnaissance Survey Protocol also appear to have been followed.

CH2M HILL archaeologists conducted the helicopter portion of the reconnaissance survey on September 8 and 9, 2008. Each of the 27 reconnaissance targets were subject to close aerial survey and videotaping at heights of approximately 50 to 300 feet above the ground, in apparent deviation from the Reconnaissance Survey Protocol. Navigation to each reconnaissance target was accomplished through the use of the GPS navigation computer in the helicopter, reference to hardcopy USGS 7.5-minute topographic quadrangle series maps, and hand-held GPS units. Where safe landing zones for the helicopter were found in Areas 1–7, and 11 (There were 14 such zones, or N =14), the archaeologists conducted meandering pedestrian surveys of the crest of target ridgelines and of the topographic highs. Photographs and GPS coordinates were

taken along each surveyed ridge crest. The other field recordation methods of the Reconnaissance Survey Protocol also appear to have been followed.

Results

The helicopter and pedestrian reconnaissance survey did not result in the discovery of archaeological features or deposits that CH2M HILL archaeologists understood to be Native American traditional use areas. The reported results of the survey are presented here to document their authenticity and accuracy, and to better enable the interpretation of the archaeological record of the project area by articulating its broader archaeological context. As the vast majority of the archaeological features and deposits found unambiguously represent historic mining or prospecting activity and the balance of the features and deposits do not appear to comport in character to known prehistoric or historic Native American traditional use areas, they receive no further consideration in the present analysis.

Limestone Ridge

The result of the pedestrian survey of the Limestone Ridge was the discovery of an unreported number of historic mining and related features, and, apparently, three rock shelters. The historic mining and related features include an unreported number of mine adits and prospect pits, a concrete staircase, and a large can dump. The can dump consists primarily of sanitary cans, and includes, as lesser constituents, screw-top colorless glass jars, pull-tab beer and juice cans, and at least one evaporated milk tin with a matchstick filler closure.

The three rock shelters on the Limestone Ridge were, with one exception, devoid of artifacts and therefore difficult to ascribe to a particular culture. One rock shelter on the western side of the ridge is of unreported dimensions and has what appears to be dry-stacked rock walls of unreported dimensions associated with it. No artifacts were found in association with the shelter.

Another rock shelter of unreported location on the ridge has an entrance that is 75 centimeters high and 80 centimeters wide, and recedes two meters back into the ridge. The ceiling of the shelter apparently has small holes of unreported dimensions that open out to the sky. There appear to be dry-stacked rocks on either side of the entrance, one of which may be a short wall. Three stacked rocks flank the eastern side of the shelter entrance, and 15, approximately 20-by-20-centimeter, stacked cobbles form a wall on the western side of the entrance. Approximately 20 smaller cobbles act as filler stones, or chinks in the voids between the larger stones in the wall. Both the wall and the three stacked rocks are reported to have further smaller gravel chinks. The condition of the wall and the three stacked rocks is reported to be good. No artifacts were found in association with this shelter.

The third rock shelter appears to be near the crest of the ridge and opens up onto the western and eastern sides of it. A slightly polished, apparent artifact, or manuports, was found inside the shelter. The manuport is reported to be a large igneous rock with one very flat surface that apparently has small, polished protrusions on it that do not exceed one centimeter in height. The protrusions are reported not to evidence grinding, and other protrusions and protruding ridges on the subject surface are reported to not be

flat. The archaeologists for the applicant interpret the manuport as likely indicative of the prehistoric use of the shelter.

Metamorphic Hill

The result of the pedestrian survey of the Metamorphic Hill was the apparent discovery of numerous prospect pits, a number of rock cairns, large areas of mechanical disturbance, a rock wall, an abandoned truck, and a geocache. The Metamorphic Hill, or the Precambrian metamorphic inselberg complex just to the east of the Ivanpah No. 3 project site boundary is made up of a smaller western inselberg, a much larger eastern inselberg, and a tiny southern knoll where ISEGS-01 is found. Three prospect pit and rock cairn complexes were found on the western and eastern inselbergs, two on the former and one on the eastern side of the latter. Each complex appears to include a single prospect pit and a single rock cairn, probably the discovery monument that marks the location of the mineral vein or lode originally exposed in each adjacent prospect pit.

A rock wall and rock cairn complex was found on the southwestern side of the eastern inselberg just above an ephemeral stream on the surface of the adjacent bajada. A portion of the east-to-west-trending rock wall and the whole cairn have fallen apart. The intact portion of the rock wall, approximately three-quarters of its eastern extent, measures approximately 3.0 meters in length and 1.5 meters in height. The wall is founded on a local outcrop of metamorphic bedrock and is itself of unreported rock type. The base of the wall is of boulders that are approximately 20 by 30 centimeters in dimension, and the size of the rock gradually decreases toward the top of the wall, the last course of which includes cobbles that are approximately 10 by 20 centimeters in dimension. An unreported number of prospect pits and an unreported type of abandoned truck were found near the wall and cairn complex. No artifacts were found in or near the broader complex.

A partially intact, solitary rock cairn was found downslope, apparently on the southern side of the western inselberg. The cairn is made up of approximately 12 large cobbles of the local metamorphic rock that encircle a large, white quartzite cobble. Additional large metamorphic cobbles and a further quartzite cobble abut the base of the cairn.

Areas 1–11

The result of the helicopter survey of Areas 1–11 appears to be the discovery of a minimum of 16 cairns, apparently of rock, a mine shaft, a mine adit, a prospect pit, and two historic trash scatters. The applicant does not clearly report the total number of archaeological features, artifact concentrations, or isolate artifacts found. This minimum inventory of archaeological remains is differentially distributed among the foothills to the southwest and west of the project site (Areas 1–6) and those to the north of it (Areas 7–11).

Areas 1–6

The arc of reconnaissance survey areas to the southwest and west of the project site, Areas 1–6, were found to have 12 of the 16 cairns, apparently of rock, the mine shaft, the mine adit, the prospect pit, and both historic trash scatters. The applicant does not clearly report the associations among these features and artifact concentrations, but a number of relatively secure associations can be made. Six of the 12 cairns appear to

bear some association with the mine shaft (N = 2), the mine adit (N = 3), and the prospect pit (N = 1). These cairns most likely were discovery monuments or boundary markers for historic lode claims. Two of the above six cairns, one that may be associated with the mine shaft and another that may be associated with the prospect pit, are reported to have been found in association with historic trash scatters, or refuse deposits. The historic refuse deposit near the mine shaft is reported to include two Prince Albert tobacco tins, and a historic beer can. The refuse deposit near the prospect pit, which the applicant appears to report as having been mechanically excavated, is reported to include one horse or burro shoe, one meat tin, and a fragmentary brown glass bottle body with two mold seams.

Four of the 12 cairns found in Areas 1–6 were found in a close group in a small saddle along a ridgeline. Each of these cairns is reported to be small and to include a few rocks of unreported type. No other archaeological features or artifacts were found in association with this cairn group.

One of the final two cairns, both of which were found as isolate archaeological features, is reported to include a wooden lathe of unreported dimensions.

Areas 7–11

The arc of reconnaissance survey areas to the north of the project site, Areas 7–11, were found to have four of the 16 cairns found as a result of the helicopter survey. The four cairns appear to have each been found as isolate archaeological features. One is reported to include a wooden lathe of unreported dimensions.

Interpretation of Results

The total cultural resources inventory for the project area of analysis includes one previously known and two new built-environment resources, and one new archaeological resource (see Cultural Resources Table 9, above). The comparison and interpretation of the results of the efforts to develop the project inventory are made here, relative to the cultural resources distribution models above, to assess the reliability of the results.

Model of Prehistoric Archaeological Resources

Comparison

The results of the efforts to identify prehistoric archaeological resources in the project area of analysis conform well to the predictions of the above model for this resource class. The composite pedestrian survey of 100 percent of the project area resulted in the identification of only three isolate prehistoric artifacts, one obsidian flake, one obsidian nodule, and one complete chert biface.

Interpretation

The extremely low frequency of unambiguous prehistoric material culture across the project area of analysis confirms the above anticipatory model for the area and appears to indicate almost no use of this portion of the Clark Mountain bajada throughout prehistory. The dearth of prehistoric artifacts in the area suggests that this portion of the

bajada has been nothing more than a transit zone between the floor of Ivanpah Valley and the Clark Mountain Range. The use of this portion of the bajada for any kind of resource collection or processing over the millennia would have undoubtedly left at least a low-frequency material trace. There is virtually none. The material trace of human activity in the area is so faint that the use of the project area as a transit zone must have been light as well. One would anticipate a higher frequency of artifacts resulting even from incidental discard had the use of the area been greater. A useful focus of future inquiry would be to investigate whether analogous environmental contexts in the region evidence a similarly light mode of human use.

Interpretation of Ethnographic Resources

No cultural resources were found in the project area of analysis that can be thought, on the basis of archaeological evidence, to unambiguously represent ethnographic resources. One or more of the three rock shelters that were found on the Limestone Ridge, the Paleozoic marine limestone inselberg just to the west of the Ivanpah No. 3 project site boundary, one or more of the isolate cairns or the cairn group found across the toe of the Clark Mountain Range foothills, and archaeological site ISEGS-01 may be Native American in origin, but none of them clearly evidence any manner of ongoing traditional use. The resources may or may not have the potential to yield information important to Native American prehistory or history, but, in the absence of attributes that unambiguously indicate continuity of use into the present or use modes that are not mundane, there is no archaeological evidence to assert the association of the resources with traditional Native American practices. Native American consultation to date contributes no further insight into the character of these resources.

Model of Historical Archaeological and Built-environment Resources

Comparison

The historical archaeological and built-environment resources found in the project area include a variety of the resource types that the above model anticipates, but the frequency of the resources is a bit lower than the model predicts. The built-environment resources include one operational (CA-SBR-10315H) and one abandoned (CA-SBR-12574H) utility corridor, and a roughly east-to-west-trending segment of a dirt road (CA-SBR-12575H). The frequency of primary deposits of historical archaeological resources in the project area is particularly low and includes only three isolate resources, a horseshoe and two mining prospects.

Interpretation

The inventory of built-environment resources comports relatively well with the anticipatory model for historical archaeological and built-environment resources. The extremely low frequency of primary deposits of historical archaeological resources in the project area is a phenomenon of interest. Given the presumed relatively high volume of foot, horse, wagon, and, most recently, automobile traffic that would have passed through the project area coming up off of the valley floor and heading toward the mines in the Clark Mountain Range, principally from the 1860s through the 1910s, one would anticipate a higher frequency of intact deposits of historical archaeological materials. One would anticipate finding debris along the travel corridors in proportion to the volume of the traffic that passed though the area, and one would further anticipate finding

refuse deposits related to temporary camps, such as ISEGS-02, that would have been used during travel to and to stage departures into the Clark Mountain Range, and to support mine prospecting efforts closer to the project area, on the limestone inselberg and in the metamorphic inselberg complex. The low frequency of primary deposits of historical archaeological materials may, therefore, indicate a lower volume of transit through the project area than had been presumed and further indicate that transit was typically without stops.

Reliability of Cultural Resources Inventory

Energy Commission staff finds, on the basis of the above analysis, that the cultural resources inventory for the project area of analysis is a reliable body of information on which the Commission can, in part, base its decision on the potential for the construction, operation, maintenance, closure, and decommissioning of the proposed project to have a significant effect on cultural resources.

National Register of Historic Places and California Register of Historical Resources Eligibility

The cultural resources inventory for the project area of analysis presently includes three built-environment resources and one archaeological resource (Cultural Resources Table 9). One of the built-environment resources, the Hoover Dam-to-San Bernardino transmission line (CA-SBR-10315H), has already been determined eligible, by consensus, for inclusion in the NRHP and is listed on the CRHR as a consequence of that determination. The CRHR eligibility of the other three resources, CA-SBR-12574H, CA-SBR-12575H, and ISEGS-01, is formally being considered here for the first time.

Investigation to Evaluate Archaeological Site ISEGS-01

Archaeological site ISEGS-01 was found as a result of the May 23, 2008 pedestrian reconnaissance survey of the inselbergs in the project area of analysis (see “Traditional Cultural Property Reconnaissance Surveys” subsection, above). Staff asked at the June 23, 2008 Data Response and Issues Resolution Workshop in Primm, Nevada, that the applicant more formally evaluate ISEGS-01. The applicant agreed to that request at the July 2, 2008 continuance of the workshop in Sacramento, and asked, in turn, that CEC and BLM staff provide a protocol for the evaluation. CEC and BLM staff jointly developed that protocol, and the BLM gave the applicant the “Protocol for the Documentation and Evaluation of Archaeological Site ISEGS-01” (ISEGS-01 Evaluation Protocol) on or about July 21, 2008 (CEC2008xx). The applicant produced a preliminary summary of the results of the field efforts for both the ISEGS-01 Evaluation Protocol and the Reconnaissance Survey Protocol in a confidential technical memorandum of September 17, 2008 (Helton, Lawson, and Spaulding 2008), which references a forthcoming, more detailed letter report. The latter report (Lawson, Helton, and Spaulding 2008), a second confidential technical memorandum of December 5, 2008, provides the final results of both protocols (see “September, 2008 Helicopter and Pedestrian Reconnaissance Survey” subsection, above, for the results of the Reconnaissance Survey Protocol).

Methods

The consultant to the applicant, CH2M HILL, implemented the ISEGS-01 Evaluation Protocol, substantively augmenting the "Background Literature Review" in the protocol. The purpose of the protocol was to more formally assess and evaluate the origin and the historical significance of ISEGS-01 in an attempt to acquire the minimum amount of data necessary to determine whether the subject site is a Native American traditional use area eligible for inclusion in either the CRHR or the National Register of Historic Places (NRHP), and, if so, whether the degradation of the integrity of the site from the construction and operation of the proposed project would be either a substantial adverse change in the significance of a historical resource under CEQA or an adverse effect under the National Historic Preservation Act. CEC and BLM staff state in the protocol that the CEC and the BLM would consider the results of the work done under this protocol sufficient to conclude the *archaeological* effort to determine whether ISEGS-01 is a Native American traditional use area.

The ISEGS-01 Evaluation Protocol requests that the applicant conduct a program of background research and field investigation. The background research portion of the program, as originally proposed, has two parts. One part is a review of the extant ethnographic literature on the Southern Paiute, the Chemehuevi, and the Mojave to discern whether site types comparable to ISEGS-01 are known for any of these groups. The Southern Paiute, the Chemehuevi, and the Mojave each identify a relationship between the project area of analysis and the ancestral territories of their respective groups. The applicant chose to refine the ethnographic literature review to look at the archaeology and the known ethnographic construction and use of rock art, and rock feature sites such as rock alignments, rock rings, and rock cairns, and to look at known construction methods of ethnographic architecture and features. The second part of the background research in the protocol requests that the applicant contact cultural resource managers, cultural resource management consultants, and archaeological scholars of the Great Basin and of the Southwest to inquire whether ISEGS-01 represents a familiar site type and to solicit professional opinions as to its origin and use. The applicant ultimately chose to augment the background research with additional archival research into the archaeological site types that have been found in mountain ranges near the project area, and into early and more recent historic accounts of exploration, travel, and economic activity in and around the project area of analysis, the purpose of both efforts being to try and locate cultural resources similar to ISEGS-01 to facilitate its interpretation. The applicant conducted the background research under the protocol during September and October, 2008. The sources that the applicant used for the research include the following paper and electronic-format media, repositories, and individuals:

- Russell Crowe's 1903 *Miner's Map of Death Valley and the Proposed Salt Lake Railroads,* SBAIC
- J. Harold Barnun's 1911 *Map of San Bernardino County,].S. Bright Surveyor,* SBAIC
- 1917 *Part of the Mohave Region Relief Map,* SBAIC
- 1932 *Blackburn's Map of San Bernardino County,* SBAIC

- 1955 *Roach Lake* 15' USGS quadrangle topographic map, University of Alabama, Historical Maps, electronic resource, http://alabamamaps.ua.edu/index.html
- 1968 *State of California Map, Southern Half,* University of Alabama, Historical Maps, electronic resource, http://alabamamaps.ua.edu/index.html
- Dennis G. Casebier's 1987 *Guide to the Mojave Trail*, SBAIC
- Brigadier General, A.A. Humphreys, Chief of Engineers, 1872, *Preliminary Report Concerning Explorations and Survey, Principally in Nevada and Arizona,* Washington D.C., Government Printing Office
- George Montague Wheeler, 1876, *Annual Report on Geological Exploration and Surveys West of the 100th Meridian,* Washington D.C., Government Printing Office
- Clarence King, 1877, *Report of the Geological Exploration of the 40th Parallel-Made by Order,* Washington D.C., Government Printing Office
- George M. Wheeler, First Lieutenant, Army Corps of Engineers, 1879, *Report upon United States Geographical Surveys West of the One Hundredth Meridian, Volume VII-Archaeology,* Washington D.C., Government Printing Office
- George M. Wheeler, Army Corps of *Engineers, 1901, Preliminary Report Concerning Explorations and Surveys Principally in Nevada*, Washington, D.C., Government Printing Office
- Samuel S. Gannett, 1903, Department of the Interior (DOl) United States Geographical Survey (USGS), *Results of the Primary Triangulation and Primary Traverse, Fiscal Year 1902–1903,* Washington D.C., Government Printing Office
- State of California Mine and Mining Claims database, SBAIC
- WorldCat, http://www.worldcat.org/
- JSTOR, www.jstor.org/
- Anthropology Plus, http://www.oclc.org/support/documentation/firstsearch/databases/dbdetails/details/AnthropologyPlus.htm
- ArticleFirst, http://www.oclc.org/support/documentation/FirstSearch/databases/dbdetails/details/ArticleFirst.htm
- AntroSource, http://www.aaanet.org/publications/anthrosource/
- Science Direct, http://www.sciencedirect.com/
- University of California-Irvine Library
- California State University-Long Beach Library
- Orange County Public Library
- Orange Library
- California State University-Fullerton, Pollack Library
- Newport Beach Public Library, Newport Beach
- Los Angeles Public Library Photo Collection, Los Angeles Public Library
- Dianne Winslow, Director, Harry Reid Center for Environmental Studies, Las Vegas
- Jeffrey R. Wedding, Archaeologist, Harry Reid Center for Environmental Studies, Las Vegas
- Robert R. Reynolds, Paleontologist, LSA Associates, Inc., Irvine
- Roderick McLean, Archaeologist, LSA Associates, Inc., Irvine

- James Cleland, Archaeologist, EDAW, San Diego
- Robin Laska, Acting Coordinator, CHRIS San Bernardino Archaeological Information Center, Redlands
- Albert Knight, Archaeologist, Southern California rock art consultant
- Dr. M.C Hall, Coordinator, CHRIS Eastern Information Center, Riverside
- Carrie Simmons, BLM, EI Centro Field Office, El Centro
- James Shearer, BLM, Barstow Field Office, Barstow
- Wanda Raschkow, BLM, Palm Springs Field Office, Palm Springs
- Eric Ritter, BLM, Redding Field Office, Redding
- Susanne Rowe, BLM, Las Vegas Field Office, Las Vegas
- John Murray, BLM, California Desert District, Moreno Valley

The "Field and Laboratory Investigations" portion of the ISEGS-01 Evaluation Protocol requests that the applicant conduct a phased investigation of the site. The phases of the investigation were to include

1) a close field examination of the site and the site vicinity, including visual inspection for artifacts, cultural manuports, and ecofacts,
2) appropriate geophysical inspections of site features and the site vicinity to ascertain the presence of ferrous metal objects or other subsurface anomalies,
3) an examination of the rock features on the site to ascertain the material composition of the features, feature construction methods apparent in the placement patterns of individual feature rocks, and the apparent relative age of the features as may be discerned by the differential development of patination and varnish, or of organism growth on feature rocks, and,
4) if the results of the above examinations and inspections proved to be inconclusive, test excavations of individual archaeological features on the site to ascertain the presence or absence of cultural residues.

The protocol also lays out a specific suite of excavation and sampling techniques that were to be used in the event that test excavation was determined to be warranted.

The archaeologists for the applicant implemented the field investigation portion of the protocol at ISEGS-01 on September 2 and 4, 2008. The close field inspection of the site and the site vicinity was apparently a tight visual scour of those areas and included the use of reflected sunlight to examine a group of constructed rock niches on the site. The geophysical inspection of the site was conducted with a Fisher Model M-96 metal detector. The entire site and all of the site features were swept with the detector, as was the level ground around the site. The applicant chose to make relative age determinations the focus of the examination of the rock features on the site. The examination took into account three different potential indices of the relative age of the site—the origin and apparent age of the quartzite rock that composes part of one terrace pavement, the degree of weathering of the constituent rocks in the rock features of the site, and the development of desert pavements on site rock terraces. To execute the examination of the features, close observations and notes were made of the color, shape, orientation, and relative distribution of the rocks that make up the features and of the rocks that form pavements on the site terraces.

Results

The results of the implementation of the ISEGS-01 Evaluation Protocol are, unfortunately, inconclusive. The background research on and the field investigation of the site are unable to reliably associate it with any particular time period, or any particular archaeological, ethnographic, or historic culture. The origin of the site, the character of its use, and its age, from an *archaeological* perspective, are enigmatic.

Background Research and an Interpretative Context for ISEGS-01

The background research for ISEGS-01, though relatively comprehensive, was largely unproductive. Additional archival research into the archaeological site types that have been found in mountain ranges near the project area and into early and more recent historic accounts of exploration, travel, and economic activity in and around the project area of analysis did not reveal or suggest any cultural resources that closely resemble ISEGS-01. Examinations of records for prehistoric and historic archaeological sites in the Spring and Lucy Gray mountain ranges and the State Line Hills in Nevada, and the Clark, Ivanpah, and Mescal mountain ranges in California, in a 15 to 20-mile radius around the project area found a total of 14 archaeological sites with constructed rock features. Seven of the 14 sites are unambiguously historic, one is unambiguously prehistoric, and the age of the other six is indeterminate. The historical archaeological sites include two mining sites with adits, a shaft, prospect pits, tailings, rock cairns, and historic refuse, two apparent ruins of dry-stacked masonry structures, two sites with a circular rock feature, two rock alignments of different forms and historic refuse, and one rock cairn with historic refuse. The prehistoric site has two rock alignments, a circular rock feature, a cleared area, a small dugout, a rock pile, and chipped and ground stone tools. The archaeological sites of indeterminate age include four sites with a circular rock feature, two rock alignments, a rock-lined dirt mound, and a small concentration of basalt cobbles, one apparent ruin of a dry-stacked masonry structure, and a “C”-shaped dry-stacked rock feature measuring 75 to 125 centimeters in height with a small (~ 1 m) square vestibule adjacent to it.

The review of both early and more recent historic accounts of exploration, travel, and economic activity in and around the project area of analysis reaffirms the broader outlines of the historic context of the project area, but does not provide more focused insight into the possible origin, function, or age of ISEGS-01.

Consultation with public sector cultural resource managers, cultural resource management consultants, and archaeological scholars also did not help interpret ISEGS-01. A number of those consulted thought that the absence of obvious eolian deposits on the site and the apparent lack of embeddedness[12] in the archaeological features of the site indicate a more recent timeframe for the construction of the site. Professional opinion on the character of the site spans a diverse range. Some see a connection to Native American shamanism in the panoramic view that the site commands and in the relatively abundant presence of quartzite on the site. Others

[12] Embeddedness describes the degree to which fine sediments surround coarse substrates on the surface of the landscape. A well-embedded archaeological feature is one where the voids or the interstices between the rocks that compose a feature are completely filled with fine sediment, and the character of the articulation of the feature with the surface of the landscape is similarly masked by fine sediment.

thought that the site features may be related to historic land surveying efforts in the region. A further opinion is that the site features may be the result of recent or historic boredom. The thought is that historic or recent miners, prospectors, or those accompanying them, or military personnel on training missions may have constructed the features for lack of anything else to do.

Neither the review of the archaeological and ethnographic literature relating to rock art and rock feature sites nor the review of Southern Paiute, Chemehuevi, or Mojave architecture and construction methods found any information that could reliably be used to interpret the individual features of ISEGS-01 or the site as a whole.

Field Investigation of ISEGS-01

Given that the background research did not yield information substantive to the interpretation of ISEGS-01, the field investigation of the site offers the only objective source of data to develop our understanding of it.

The initial step in the field investigation of ISEGS-01 was the close field inspection of the site. The site was found to include five dry-stacked rock features and feature complexes (Features A–E) (Cultural Resources Figure 2 and Plate 2) arranged on either side of the crest of the tiny inselberg directly south of the larger eastern portion of the Precambrian metamorphic inselberg complex, which is east of the Ivanpah No. 3 project site boundary. The feature complexes include an eastern and western set of rock-faced terraces. The eastern terrace complex (Feature B) abuts a bedrock outcrop along the crest of its host inselberg and includes what appear to be a constructed rock bench and three constructed stone niches. There is a rock upright incorporated into the face of one of the terraces in the complex, and part of the surface of the fill of the terrace immediately beneath the upright is a jumbled pavement of angular quartzite cobbles. There are differences in the observations of the applicant and of Energy Commission staff as to the precise number and configuration of the site features, but the western terrace complex (Feature D) appears to include two or three terraces, while the eastern terrace complex appears to include four terraces. There are three additional rock features on the site. To the north-northeast of the eastern terrace complex, there is a stand-alone, triangular rock-faced feature (Feature A) with a fill of angular cobbles of the local metamorphic rock. To the east-southeast of the eastern terrace complex, there is what the applicant refers to as the “three-tiered rock feature” (Feature E). The feature appears to be a contiguous series of four, small, roughly square, rock-faced terraces. To the south-southeast of the eastern terrace complex, there is what the applicant refers to as the “dry-stacked rock wall” (Feature C). The feature is relatively short in length and presently measures approximately 50 to 60 centimeters in height. The applicant notes that a portion of the wall appears to have collapsed.

The field inspection of ISEGS-01, its constituent rock features, and the near-vicinity found no artifacts that could be unambiguously associated with the construction or use of the site. No portable material culture objects of any type were found in or among the site features. A sparse scatter of historic artifacts was found in a range of five to 15 meters from the site. Those artifacts include a fragmentary “7-Up” soda bottle that the archaeologists for the applicant date to the 1970s, colorless glass fragments that the

archaeologists for the applicant interpret as beverage bottle fragments, and a recent shotgun shell casing.

The geophysical prospection of ISEGS-01 with the Fisher Model M-96 metal detector produced no signals that would indicate the potential presence of metallic debris.

The examination of the rock features of ISEGS-01 for potential indices of the relative age of the site concludes that the probable time of its construction ranges somewhere from the very late or terminal prehistoric period to the early historic period. The examination took into account three different potential indices of the relative age of the site—the origin and apparent age of the quartzite rock that composes part of one terrace pavement, the degree of weathering of the constituent rocks in the rock features of the site, and the development of desert pavements behind site rock terraces. The archaeologists for the applicant found that the origin of the quartzite rock that makes up the jumbled pavement of angular cobbles on one of the terraces of Feature B is a wide ($\leq$ 3 m) vein of quartzite approximately 30 meters to the northeast of the site. The vein has apparently been subject to mechanical prospection with heavy equipment. A comparison of the degree of weathering of the quartzite in the pavement versus the quartzite in and around the vein, in particular, the degree of discoloration and the shape of the rock, demonstrates that the quartzite that makes up the pavement was extracted from the vein prior to its mechanical prospection. There is a much higher incidence (30%) of the quartzite in the pavement being discolored from long-term weathering, of becoming reddened over time, than there is in the quartzite from the vein (4%). As the discoloration of the quartzite occurs primarily 5–10 centimeters below the surface of the vein, much of the quartzite for the pavement appears to have been gathered prior to the removal of that weathered zone by the mechanical prospection. The archaeologists also noted that the quartzite of the terrace pavement and the quartzite in and around the vein were similarly angular in shape. The quartzite of the pavement does not appear to have been exposed for the many hundreds or thousands of years that would typically be necessary to dull and round the sharp edges of the pavement cobbles.

The examination of the degree of weathering of the constituent rocks in the rock features of ISEGS-01 suggest that the features were constructed decades to centuries ago, but not millennia. The constituent rock of the rock features is predominantly the Precambrian metamorphic rock that composes the inselberg that hosts ISEGS-01 and that is found as the major component of the colluvium that mantles the inselberg. The metamorphic rock of the colluvium was presumably the source of the rock used to construct the site features. The slab- or tabular-shaped rocks are typically partially buried or seated in the inselberg's colluvial matrix of finer sediment, and, over time, the colluvial rock is subject to processes of weathering. The exposed portions of the rock are subject to physical and chemical weathering from the sun, rain, and dilute botanical acids, while the buried portions of the rock are subject to processes of pedogenic alteration that include oxidation or reddening of rock surfaces and the slow accumulation of a $CaCO_3$ rind. Rock that was dislodged from the surface of the inselberg to construct the features on ISEGS-01 would originally have had one side, the exposed side, almost black from the development of rock varnish and the other side, the buried side, a patchwork of deep red staining and beige $CaCO_3$ crust. Over time, the exposure of the rock in the constructed features to the elements slowly washes the red

staining and dissolves the $CaCO_3$ until ultimately, neither are apparent. The archaeologists for the applicant quantified the amount of rock in features A and B where red staining was apparent and found that, generally, the number of rocks that had no red staining was greater than would be anticipated if the features were relatively newly constructed. The archaeologists interpreted the degree of red staining found to indicate, grossly, that the features have been in place for decades to centuries.

A final examination was made of the degree to which desert pavements have developed on the flat surfaces or treads of the terraces that are parts of features B and E, and the surface of feature A. Desert pavements that have developed over thousands of years come to exhibit a suite of characteristics that include the progressive leveling of the land surface, the reduction in the size of constituent pavement rocks due to fracturing, the loss of sharp edges on constituent pavement rocks, the progressive darkening of pavement rock as a deeper rock varnish develops, and the progressive accumulation of fine silt among and beneath the surface rock that forms the desert pavement. The archaeologists for the applicant documented the degree to which the terrace treads of features B and E, and the surface of feature A displayed these characteristics and found that, while there was a noticeable accumulation of silt beneath the subject surfaces, the accumulation was relatively slight. The archaeologists found, in consideration of the broader suite of desert pavement characteristics, that the pavements on features A, B, and E were incipient phenomena, not representing thousands of years of development.

The archaeologists for the applicant found, in consideration of the total complement of the field examinations of ISEGS-01, that the construction of the site most likely dates to somewhere from the very late or terminal prehistoric period to the early historic period, and were unable to establish the cultural identity of the people who built the site. The character of the partial quartzite pavement on feature B, the degree of $CaCO_3$ rind removal and the relative loss of red staining on constituent rocks of the rock features on the site, and the incipient character of desert pavement development on those features are the evidentiary basis for the interpretation of the age of the site. The absence of metallic or other artifacts or cultural residues that are clearly associated with the construction or use of the site, and construction techniques and architectural forms that are presently indistinct make it difficult to attribute the site to any particular group of people.

There are a number of aspects of the ISEGS-01 Evaluation Protocol that the applicant did not address that warrant consideration. The protocol requests (“Consultation with Regional Experts” subsection) that the applicant contact and solicit the professional opinions of experts in the archaeology of both the Great Basin and the Southwest. The rock features on the site, several of which resemble agricultural features, are not common archaeological forms in either California or many parts of the Great Basin. The forms may be more common in the eastern and southern Great Basin and in the Southwest or resemble other forms found there. It does not appear that any of the professionals that the applicant contacted are experts in Southwest archaeology generally or prehistoric agriculture in the Southwest, more particularly. Consultation with experts in these areas may have been useful to the interpretation of the site.

The ISEGS-01 Evaluation Protocol also requests that the applicant examine the rock features of the site to ascertain what the feature construction methods were. The

applicant chose to focus on questions of the relative age of the features to the exclusion of considerations of how the features were built, the potential functions of the individual feature types, or how, potentially, the functions of the feature types may articulate the overall use of the site.

ISEGS-01 appears to be an odd grouping of agricultural and non-utilitarian features on a relatively inhospitable knoll in the Mojave Desert, a grouping that does not appear to be typical of California or Great Basin prehistory. The long, narrow, rock-faced terrace series of features B and D appear similar to hillslope agricultural terraces known prehistorically for many parts of the world and still widely in use today. Referring to Energy Commission staff photographs from the May 23, 2008 pedestrian reconnaissance survey of the project area inselbergs, the terrace series of features B and D exhibit attributes that evidence the purposive construction of features to impound sediment. While the one to four courses of jumbled boulders and cobbles that appear to typically compose the single-faced terrace facades convey a sense that terrace construction was expedient, the facades appear to be relatively sound and they appear to be purposively backed, on the upslope face, by a layer of cobbles and gravels. Such a layer is common in agricultural terrace construction, with the purpose of helping to impound the sediment behind the terrace facade so that the sediment is less likely to erode downslope through the terrace face. Whether the terrace fill that the archaeologists for the applicant describe as typically being a silty, clast-supported matrix would support or inhibit plant growth is unknown.

What appear to be non-utilitarian features are found in and among the terrace series of ISEGS-01. There is the stand-alone, triangular rock feature, feature A, that essentially forms a small rock platform. The construction method of the facade of the feature appears to parallel that of the terrace series, while the fill of the feature appears, on the basis of the photographs in the confidential technical memorandum of December 5, 2008, to be primarily angular cobbles of the local metamorphic rock. Other apparently non-utilitarian features include the rock upright that abuts the partial quartzite pavement on one of the terraces in the feature B terrace series, the quartzite pavement itself, the apparent bench feature which abuts the bedrock outcrop upslope and west of feature B, and the three constructed rock niches built into that same bedrock outcrop. A further anomalous feature is the apparent remnant, dry-stacked rock wall, feature C.

ISEGS-01 is certainly enigmatic. There is presently no reliable *archaeological* means to verify or refute the character of the use of the site. Among innumerable other potential interpretations for the site, Energy Commission and BLM staff wonder whether it may be a late prehistoric or early historic Native American traditional use area, more specifically, a site the use of which may have been ritual in character. The points that staff would offer in support of this interpretation are the location of the site on a landform that is inhospitable and would appear to represent the economic periphery of the geography of any people, the presence of the set of the non-utilitarian features above, and the presence of what appear to be agricultural terraces that, while utilitarian in form and construction, are of a scale too small to produce substantive food resource yields, a scale that may indicate the purpose of the terraces is more symbolic than economic. The purpose of the terraces may have been to represent or symbolize agriculture to the users of the site rather than to actually have been used to conduct agriculture.

Whatever the use of ISEGS-01 may have been, Energy Commission and BLM staff only hope that the present inability of our discipline to readily attribute the site to a particular group of people or to a certain span of time does not constrain our willingness to openly face the question of its history.

Archaeological Resources

One archaeological resource, ISEGS-01 is now known to be present in the project area of analysis. The results of the investigation to gather information to evaluate the historical significance of the archaeological site are found in the "Investigation to Evaluate Archaeological Site ISEGS-01" subsection above. A summary of the information from the subsection is provided here as a brief context for the staff recommendation on the eligibility of the resource for listing in the CRHR.

ISEGS-01 is an archaeological site that includes five dry-stacked rock features and feature complexes arranged on either side of the crest of the tiny inselberg directly south of the larger eastern portion of the Precambrian metamorphic inselberg complex, which is east of the Ivanpah No. 3 project site boundary. The feature complexes include eastern and western sets of relatively long, rock-faced terraces, another contiguous series of four, small, roughly square, rock-faced terraces, a stand-alone, triangular rock-faced feature with a fill of angular cobbles of the local metamorphic rock, and a remnant dry-stacked rock wall.

The field inspection of ISEGS-01, its constituent rock features, and the near-vicinity found no artifacts that could be unambiguously associated with the construction or use of the site. No portable material culture objects of any type were found in or among the site features. A sparse scatter of three historic artifacts was found in a range of five to 15 meters from the site.

The investigation of ISEGS-01 was unable to conclusively establish the age or the cultural identity of the builders or users of the site. Neither the review of the archaeological and ethnographic literature relating to rock art and rock feature sites nor the review of Southern Paiute, Chemehuevi, or Mojave architecture and construction methods found any information that could reliably be used to interpret the individual features of ISEGS-01 or the site as a whole. The geophysical prospection of the site and site vicinity with a metal detector produced no signals that would indicate the potential presence of metallic debris. Geoarchaeological examinations of the rock features of ISEGS-01 for potential indices of the relative age of the site conclude that the probable time of its construction ranges somewhere from the very late or terminal prehistoric period to the early historic period. The archaeologists for the applicant were ultimately unable to establish the cultural identity of the people who built the site. Among innumerable other potential interpretations for the site, Energy Commission and BLM staff speculate whether it may be a late prehistoric or early historic Native American traditional use area, more specifically, a site the use of which may have been ritual in character.

Given that ISEGS-01, notwithstanding the thorough investigation and consideration of the resource, cannot be associated with events that have made a significant contribution to the broad patterns of our history or with the lives of persons significant in

our past, that it cannot be associated with or said to embody the distinctive characteristics of a type, period, or method of construction, that it cannot be associated with or said to represent the work of a master, or possess high artistic values, and that it has not yielded, and is not likely to yield, information important to prehistory or history, the BLM determines that the site does not meet any of the criteria for inclusion on the NRHP. Energy Commission staff recommends that the Energy Commission, as lead agency and pursuant to Title 13, Public Resources Code, section 21084.5, determine that ISEGS-01 is not eligible for listing in the CRHR.

The results of the evaluation of the historical significance of ISEGS-01 constitute a relatively unusual circumstance where the resource is being recommended as not eligible for listing in either the NRHP or the CRHR, because the site cannot be reliably associated with any time period, or any archaeological, ethnographic, or historic culture. Energy Commission and BLM staff would like to note here that this circumstance does not necessarily mean that the archaeological site is not, in a more objective sense, historically significant. It is plausible that further future investigation of the resource may ultimately establish the associations necessary to conclude a definitive evaluation of its place in prehistory or history. State and Federal regulatory historic preservation programs have a defined reach, and ISEGS-01 appears to be beyond the present regulatory reach of CEQA, NEPA, and the NHPA. The consideration of the resource in the present analysis well demonstrates the due diligence of the applicant for the proposed project, and of BLM and Energy Commission staff to fulfill the obligations of our joint regulatory processes. Others in the public will hopefully be able to invoke alternate State and Federal historic preservation programs in the future to ensure the preservation of ISEGS-01 until it is better understood.

Ethnographic Resources

No CRHR-eligible ethnographic resources have yet been found in the project area of analysis.

Built Environment Resources

Three built-environment resources are now known to be present in the proposed project area. They include the Hoover Dam-to-San Bernardino transmission line (CA-SBR-10315H), a dismantled, early-to-mid-twentieth-century telephone line and an unimproved, two-track dirt road that parallels it (CA-SBR-12574H), and an approximately 1,200-foot -long segment of a faint, unimproved two-track dirt road (CA-SBR-12575H).

Additional consideration is given here to the presence and the historical significance of a discontiguous, multi-element resource, the Hoover Dam-to-San Bernardino transmission facility, which incorporates the material elements that are critical for the resource to transmit electricity.

Hoover Dam-to-San Bernardino Transmission Line (CA-SBR-10315H)

The Hoover Dam-to-San Bernardino transmission line (CA-SBR-10315H) continues in operation today as the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115-kV transmission line. The line trends approximately northeast to southwest between the proposed Ivanpah No. 1 and No. 2. The typical structures that make up the transmission

line are metal, H-frame, riveted, latticed masts and metal crossbeams. The design specifications for the H-frame structures call for the masts to be 17 feet apart and 52 feet tall. The crossbeams that span each pair of masts are approximately 34 feet in length and carry three transmission cables. Only one of the H-frame structures in the project area appears to have been replaced since the original construction of the line. The replacement structure has wooden masts and a wooden crossbeam (pp. 12–14, Solar Partners I et al. 2008f).

Southern Sierras Power Company, a wholly-owned ally company of the Nevada-California Power Company, began construction of the original 132-kV Hoover Dam-to-San Bernardino transmission line in 1930 in BLM Right-of-Way (ROW) Grant No. R 01730 (p. 7, Solar Partners I et al. 2008f). The 225-mile-long line was completed in 1931 in a record 225 days. The original purpose of the line was to carry electricity from the City of San Bernardino to the construction site for Hoover Dam. The line was reversed in August of 1937 to carry electricity back to San Bernardino from Unit A-8, a 55,000-h.p., 40-MW hydroelectric turbine, at Hoover Dam. A telephone line, CA-SBR-12574H, was built in 1931 approximately 3,000 feet to the southeast of the transmission line, also inside the bounds of ROW Grant No. R 01730, to facilitate operational communications along the transmission line (pp. 7, 10, Solar Partners I et al. 2008f).

The BLM and the California State Historic Preservation Officer (SHPO) concluded a consensus determination for the Hoover Dam-to-San Bernardino transmission line on October 22, 1993, as part of a consultation under Section 106 of the National Historic Preservation Act (California Office of Historic Preservation File Nos. ADOE-36-93-007-00 and BLM841127R) (confidential appendix 5.3C, BSE2007a,). The BLM and the SHPO agreed that the resource was individually eligible for inclusion in the NRHP under Criterion A due to its association with the construction of Hoover Dam, and the role of Hoover Dam in the development of the energy industry in the West (p. 9, Solar Partners I et al. 2008f). Under Title 14, California Code of Regulations, section 4851, subdivision (a)(1), the transmission line is on the CRHR as a result of the above consensus determination.

The BLM here determines that CA-SBr-10315H retains sufficient integrity and is individually eligible for inclusion on the NRHP under Criterion A. In addition, the resource is potentially eligible under Criterion C.

Energy Commission staff believes that the preponderance of the available evidence argues against the eligibility of the Hoover Dam-to-San Bernardino transmission line for the CRHR as an individual resource. The transmission line is one element of a transmission facility that now includes the transmission line, the remnants of the original 1931 telephone line (CA-SBR-12574H), microwave signal transmitters, and control mechanisms such as the transformers, switches, and circuit breakers that are integral parts of electric substations. The transmission line, the control mechanisms, and one form of communication system are each critical to the operation of the transmission facility. The facility, absent any one of the critical elements, cannot sustain the function of the facility. The Hoover Dam-to-San Bernardino transmission facility, as a composite resource, appears, in turn, to be more appropriately considered as an element of a potential Hoover Dam Historic District, one aspect of the eligibility of which would be, under CRHR Criterion 1, the association that the potential district has as the major

source of the generation and distribution of electric power for the Southwest and parts of California during the first half of the twentieth century, electric power that was critical to industrial and agricultural development, and to the urbanization of the region during that period. Absent the association that the Hoover Dam-to-San Bernardino transmission facility would have with a potential Hoover Dam Historic District, the transmission facility would not appear to be CRHR-eligible under any of the other CRHR criteria. Energy Commission staff therefore recommends that the Hoover Dam-to-San Bernardino transmission line is not eligible for listing in the CRHR as an individual or stand-alone resource, because it is only one element of a multi-element resource. Staff further recommends that the transmission line be considered one element of a single, discontiguous resource, the Hoover Dam-to-San Bernardino transmission facility, which includes, but is not limited to, the transmission line and the original 1931 telephone line, and which is also not eligible for listing in the CRHR as an individual or stand-alone resource because the resource is not historically significant absent its association with Hoover Dam. Staff provides recommendations on the CRHR eligibility of the transmission facility, as a contributing element to a potential Hoover Dam Historic District, below.

CA-SBR-12574H

CA-SBR-12574H is a dismantled telephone line and a parallel, unimproved, two-track dirt access or service road. Only a portion of the resource appears to have been recorded in the project area, an approximately 2,200-foot long segment through the northwestern quadrant of Ivanpah No. 1. The telephone line and the road trend approximately northeast to southwest. Both elements of the resource are traceable in aerial photographs east of Interstate Route 15 and out across Ivanpah Valley.

The telephone line is now a line of wooden utility pole bases that have been cut off approximately 6–12 inches above the present surface of the project area. There is an assemblage of artifacts from the downed line among the pole bases. The assemblage includes a few of the downed cedar poles, which appear to have originally been 25 feet tall with hardware consisting of metal nuts and bolts, metal brackets or plates, metal cable, wooden cross beams, and glass insulators. The insulators (McLAUGHLIN No. 19 and HEMINGRAY–42) indicate a date range for the construction of the telephone line sometime from 1920 to 1967.

The approximately ten-foot-wide, two-track dirt road is about ten feet northwest of and parallel to the telephone line. Ephemeral stream channels appear to dissect the road in a number of places along the recorded road segment.

No other artifacts, beyond the parts of the utility line, were found in association with either element of the resource (DPR 523 series forms, Fergusson 2007).

The telephone line and the dirt access road were built in 1931 under BLM ROW Grant No. R 01730 by the Interstate Telegraph Company, a subsidiary of the Nevada-California Electric Corporation, for the apparent sole purpose of facilitating private transmission line communications along the Hoover Dam-to-San Bernardino transmission line (p. 7, Solar Partners I et al. 2008f). The CRHR eligibility of the resource, the telephone line and the access road together, is considered here as a

stand-alone resource, above as a critical element of the stand-alone Hoover Dam-to-San Bernardino transmission facility, and, below as a critical element of the Hoover Dam-to-San Bernardino transmission facility, itself a contributing element of a potential Hoover Dam Historic District. Given the resource's obvious loss of integrity of design, materials, and workmanship, staff recommends that the Energy Commission, as lead agency and pursuant to Title 13, Public Resources Code, section 21084.5, determine that the portion of CA-SBR-12574H in the project area would not contribute to the CRHR eligibility of the stand-alone resource, as a whole, if it were ever found to be so eligible. The BLM concurs and agrees that the portion of CA-SBR-12574H in the project area does not contribute to the eligibility of the line, as a whole, as a stand-alone resource, to the NRHP.

Hoover Dam-to-San Bernardino Transmission Facility

The Hoover Dam-to-San Bernardino transmission facility now includes, potentially, the Hoover Dam-to-San Bernardino transmission line (CA-SBR-10315H), the remnants of the original 1931 telephone line (CA-SBR-12574H), microwave signal transmitters, and control mechanisms such as the transformers, switches, and circuit breakers that are integral parts of electric substations. To date, there is documentation of the transmission line and the portion of the original telephone line in the project area. Energy Commission staff recommends both the transmission line and the telephone line as not eligible for listing in the CRHR, as stand-alone resources, and further recommends the subject transmission facility, as a stand-alone resource, as not eligible (see above). The question remains whether the facility may be eligible for listing either in the NRHP or the CRHR as a contributing element to a potential Hoover Dam Historic District. The BLM determines that the Hoover Dam-to-San Bernardino transmission facility (CA-SBR-10315H, CA-SBR-12574H, and associated construction camps known to occur along portions of the length of the transmission line) constitutes a contributing element to a potential Hoover Dam Historic District. Energy Commission staff recommends that the transmission facility is not eligible for listing in the CRHR as a contributing element to a potential Hoover Dam Historic District, because the facility does not retain its ability to convey its historical significance. The transmission facility lacks integrity of design, materials, workmanship, and association, because one critical element of the resource, the original 1931 telephone line, has been dismantled. The sustained operation of the transmission facility would not have been possible without the telephone line, so the property is no longer able to adequately convey the sense of how it functioned during most of its apparent period of significance, 1931–1958.

CA-SBR-12575H

CA-SBR-12575H is a faint segment of an unimproved, two-track dirt road that appears to have been abandoned for a while. Only a portion of the road in the project area, an approximately 1,200-foot-long segment through the northwestern quadrant of Ivanpah No. 1, was recorded. The approximately eight-foot-wide dirt road trends roughly east-southeast to west-northwest. The western end of the road continues on out of Ivanpah No. 1 toward the Clark Mountain Range, while the eastern portion of the road becomes progressively more difficult to trace as ephemeral stream channels obliterate the road tracks. No artifacts were found in direct association with the road (p. 5.3-20, BSE2007a; p. 19 and DPR 523 series forms, Fergusson 2007).

Given that the resource cannot be associated with events that have made a significant contribution to the broad patterns of our history or with the lives of persons significant in our past, that it does not embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, that it has not yielded, and is not likely to yield, information important to history, and that the resource does not retain integrity of design, workmanship, feeling, or association, staff recommends that the portion of the resource in the project area would not contribute to the CRHR eligibility of the road, as a whole, if it were ever found to be so eligible. BLM determines that the site does not meet any of the criteria for eligibility for listing on the NRHP.

Summary of NRHP- or CRHR-Eligible Resources for the Ivanpah SEGS Project

There presently appears to be one cultural resource in the proposed project area that is NRHP- and CRHR-eligible, i.e., that is a historical resource for the purposes of CEQA. This is the Hoover Dam-to-San Bernardino transmission line (CA-SBR-10315H). The potential impact of the project on this resource and a proposal to mitigate that impact are developed below.

DIRECT/INDIRECT IMPACTS AND MITIGATION

In the abstract, direct impacts to cultural resources are those associated with project development, construction, and co-existence. Construction usually entails surface and subsurface disturbance of the ground, and direct impacts to archaeological resources may result from the immediate disturbance of the deposits, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation, or demolition of overlying structures. Construction can have direct impacts on historic standing structures when those structures must be removed to make way for new structures or when the vibrations of construction impair the stability of historic structures nearby. New structures can have direct impacts on historic structures when the new structures are stylistically incompatible with their neighbors and the setting, and when the new structures produce something harmful to the materials or structural integrity of the historic structures, such as emissions or vibrations.

Generally speaking, indirect impacts to archaeological resources are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource components due to improved accessibility. Similarly, historic structures can suffer indirect impacts when project construction creates improved accessibility and vandalism or greater weather exposure becomes possible.

Ground disturbance accompanying construction at a proposed plant site, along proposed linear facilities, and at a proposed laydown area has the potential to directly impact archaeological resources, unidentified at this time. The potential direct, physical impacts of the proposed construction on unknown archaeological resources are commensurate with the extent of ground disturbance entailed in the particular mode of construction. This varies with each component of the proposed project. Placing the proposed plant into this particular setting could have a direct impact on the integrity of association, setting, and feeling of nearby standing historic structures.

Proposed Project—Construction Impacts and Mitigation

Identification and Assessment of Direct Impacts on Archaeological Resources and Proposed Mitigation

Archaeological Resources on the Surface of the Project Site

No NRHP- or CRHR-eligible prehistoric or historical archaeological resources are now known to be on the surface of the project site. Given the thorough investigation of the surface of the project site for the present analysis and the dearth of archaeological resources found, it appears to be highly improbable that the construction-related ground disturbance of the project would directly impact surface archaeological resources that would qualify as historical resources under CEQA.

Buried Archaeological Resources in the Project Site

No properties eligible for inclusion on the NRHP or CRHR-eligible archaeological resources are now known to be beneath the surface of the project site. On the basis of the results of the geoarchaeology study above (pp. 9–18, CH2ML2008b), it is highly improbable that the construction-related ground disturbance of the project, on the portions of the project site where deep (> 1 meter) ground disturbance would occur, would directly impact buried archaeological resources that would qualify as historical resources under CEQA.

Identification and Assessment of Direct Impacts on Ethnographic Resources

No NRHP- or CRHR-eligible ethnographic resources are known to be on the project site or in the project area of analysis. On the basis of the results of the literature and records search and the helicopter and pedestrian reconnaissance survey above and Native American consultation, to date, it presently appears unlikely that construction-related ground disturbance for the project would directly impact ethnographic resources that would qualify as historical resources under CEQA.

Identification and Assessment of Direct Impacts on Built-Environment Resources and Proposed Mitigation

One NRHP-eligible and CRHR-listed built-environment resource, the Hoover Dam to San Bernardino transmission line (CA-SBR-10315H) is on the project site. The effects of the proposed project on the subject transmission line have been found to be cumulative in character, rather than the direct result of the construction, operation, maintenance, closure, and decommissioning of the project (see “Cumulative Scenario” and “Cumulative Impacts and Mitigation” subsections, above and below). No other built-environment resources that qualify as historical resources under CEQA are known on the project site, and there is virtually no chance, given the stark visual presence of built-environment resources, that new, unknown ones will be found.

Proposed Project—Indirect Impacts

Neither the applicant nor staff has identified any indirect impacts to any CRHR-eligible resources in the project area of analysis. Staff believes, therefore, that mitigation for indirect impacts is not necessary for the proposed project.

Proposed Project—Operation Impacts and Mitigation

Staff does not believe that the operation of the proposed power plant would impact any CRHR-eligible resources in the project area of analysis. Any reasonably foreseeable task that the applicant would perform to operate the facility would not impact CRHR-eligible resources, because no such resources appear to be present on the surface of the project area of analysis and the potential presence of archaeological resources beneath the surface of the project area of analysis is thought to be negligible (see "Cultural Resources Inventory Fieldwork" subsection, above).

As staff does not anticipate the operation of the proposed power plant to impact any CRHR-eligible resources in the project area of analysis, staff does not believe that mitigation is necessary for the operation of the facility.

Proposed Project—Closure and Decommissioning Impacts and Mitigation

Staff does not believe that the closure and decommissioning of the proposed power plant would impact any CRHR-eligible resources in the project area of analysis. Any reasonably foreseeable task that the applicant would perform to close and decommission the facility would not impact CRHR-eligible resources, because no such resources appear to be present on the surface of the project area of analysis and the potential presence of archaeological resources beneath the surface of the project area of analysis is thought to be negligible (see "Cultural Resources Inventory Fieldwork" subsection, above).

As staff does not anticipate the closure and decommissioning of the proposed power plant to impact any CRHR-eligible resources in the project area of analysis, staff does not believe that mitigation is necessary for the closure and decommissioning of the facility.

No Project / No Action Alternative

In the No Project / No Action Alternative, the proposed action would not be undertaken. The BLM land on which the project is proposed would continue to be managed within BLM's framework of a program of multiple use and sustained yield, and the maintenance of environmental quality [43 U.S.C. 1781 (b)] in conformance with applicable statutes, regulations, policy and land use plan.

The results of the No Project / No Action Alternative would be the following:

- The impacts of the proposed project would not occur. However, the land on which the project is proposed would become available to other uses that are consistent with BLM's land use plan, including another solar project.
- The benefits of the proposed project in reducing greenhouse gas emissions from gas-fired generation would not occur. Both State and Federal law support the increased use of renewable power generation.

If this project is not approved, renewable projects would likely be developed on other sites in the Mojave Desert or in adjacent states as developers strive to provide

renewable power that complies with utility requirements and State/Federal mandates. For example, there are three large solar projects proposed on BLM land in Nevada within a few miles of the Ivanpah site. In addition, as of August 2009 there were 66 applications for solar projects covering 611,692 acres pending with BLM in the California Desert District. The No Project/No Action Alternative would not cause any significant impacts to Cultural Resources.

Cumulative Impacts and Mitigation

A project may contribute to a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (Cal. Code Regs., ti. 14, § 15130).

There is the potential for substantial future development in the Ivanpah Valley area and throughout the southern California desert region. The analysis of cumulative impacts here is based on data provided in the following maps and tables (see “Cumulative Scenario” section, above):

Cumulative Impacts Figure 1, Regional Renewable Applications
Cumulative Impacts Figure 2, Regional Renewable Applications (Detail)
Cumulative Impacts Figure 3, Ivanpah Valley Existing and Future/Foreseeable Projects
Cumulative Impacts Table 1, Regional Renewable Energy Projects
Cumulative Impacts Table 2, Existing Development in the Ivanpah Valley
Cumulative Impacts Table 3, Future Foreseeable Projects in the Ivanpah Valley Area.

The analysis in this section first defines the geographic area over which cumulative impacts to cultural resources could occur. The cumulative impact analysis itself describes the potential for cumulative impacts to occur as a result of the implementation of the ISEGS project along with the listed local and regional projects.

Geographic Extent

Cumulative impacts can occur if the implementation of the ISEGS project could combine with the impacts of other local or regional projects. Cumulative impacts would occur locally if ISEGS project impacts combined with the impacts of projects located within the Ivanpah Valley. Cumulative impacts could also occur as a result of the development of some of the many proposed solar and wind development projects that have been, or are anticipated to be, under consideration by the BLM and the Energy Commission in the near future. Many of these projects are located within the California Desert Conservation Area, as well as on BLM land in Nevada and Arizona.

Therefore the geographic extent for the analysis of *local* cumulative impacts is defined as the Ivanpah Valley. The proximity of cultural resources to the ISEGS project would be of interest only to the extent that such proximity would considerably affect the context or integrity of cultural resources. This geographic scope is appropriate because it is likely that cultural resources similar to those in the ISEGS project area of analysis are present throughout this area.

Regional cumulative impacts are those that could occur as a result of the implementation of future solar and wind development projects that are currently proposed on over one million acres of the California Desert Conservation Area, as well as on BLM land in Nevada and Arizona. Therefore, the geographic extent for the analysis of *regional* cumulative impacts is defined as the desert areas of southeastern California, southern Nevada, and western Arizona, as shown on Cumulative Impacts Figure 1 (Regional Renewable Applications).

Cumulative Impact Analysis

Local Projects

The construction, operation, maintenance, closure, and decommissioning of a number of projects presently proposed and under consideration in the Ivanpah Valley area would result in a significant cumulative impact on at least one known historical resource, the Hoover Dam-to-San Bernardino transmission line (CA-SBR-10315H)[13], and may further effect other cultural resources of the types now known for the ISEGS project area. The contribution of the proposed project to the effect of the proposed reconstruction by the Southern California Edison Company (SCE) of approximately 36 miles of the Eldorado leg of the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass transmission line, the line which now includes the remaining portion of the original Hoover Dam-to-San Bernardino transmission line, would be cumulatively considerable, and the effect of the subject reconstruction on CA-SBR-10315H would be significant. The reconstruction of the Eldorado leg is found herein, for the purposes of cumulative impact analyses, to be a foreseeable future project that may occur near the proposed project (see "Cumulative Scenario" section above). The subject reconstruction would entail one portion of the Eldorado leg being removed from the proposed project area approximately northeast to the Eldorado Substation. The original proposal of the California Independent System Operator (California ISO) was to reconstruct the removed portion of the line to facilitate a higher transmission capacity of 220 kV (CH2ML2008e, pp. ii–iii). There appears to be other plans to modify the Hoover Dam-to-San Bernardino line, through the project area. The applicant has related that SCE also plans to remove the portion of the transmission line from the project area southwest to the Mountain Pass Substation and to replace it with two, double-circuit, 115-kV pole lines (CH2ML2008m, p. 6). Given that the California ISO assigns approximately 400 MW of the approximately 1,900-MW capacity of the modified transmission line to the proposed project, the contribution of the proposed project to the partial destruction of the Hoover Dam-to-San Bernardino transmission line would be approximately 21

[13] The BLM, pursuant to stipulation V.E.1 of the 2007 *State Protocol Agreement among the California State Director of the Bureau of Land Management and the California State Historic Preservation Officer and the Nevada State Historic Preservation Officer Regarding the Manner in which the Bureau of Land Management Will Meet its Responsibilities under the National Historic Preservation Act and the National Programmatic Agreement among the BLM, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers*, has determined that the status of the transmission line as individually eligible for inclusion in the NRHP, a consensus determination concluded by the BLM and the California State Historic Preservation Officer in 1993, stands. As such, the transmission line remains listed on the CRHR, notwithstanding the recommendation of Energy Commission staff to the contrary (see "Built-Environment Resources" subsection, above), and is a historical resource for the purpose of the present analysis.

percent. Staff proposes to offset this cumulatively considerable portion of the effect of the proposed transmission line reconstruction on CA-SBR-10315H through the implementation of proposed Conditions of Certification **CUL-8** and **CUL-9**, conditions which staff believes are appropriate to the scale and character of the effect of the proposed project on the subject historical resource. The mitigation proposed in Conditions of Certification **CUL-8** and **CUL-9** would consist of the Historic American Engineering Record (HAER) recordation of the tower types and the cabling system of the portion of the Hoover Dam-to-San Bernardino transmission line that traverses the project area. While the proposed mitigation would result in the recordation of significantly less than the approximate 21 percent share of the destruction to which the proposed project would contribute, staff believes that the scope of the mitigation reasonably takes into account the likelihood that the historical resource would undergo HAER recordation as a result of the NEPA analysis that the BLM would conduct in conjunction with its planning for and authorization of SCE's modifications to the Hoover Dam-to-San Bernardino transmission line. Staff also believes that the mitigation would be sufficient to compensate for any modifications to the line that would be necessary to accommodate only the proposed project if SCE were to downgrade the scale of the modifications to the line to take into account any of the other presently proposed projects withdrawing from the California ISO queue.

The construction of other projects in the same vicinity as the proposed project could affect *unknown* cultural resources of the types that the ISEGS project would affect. A large number of other projects are proposed and under consideration in the Ivanpah Valley area, and many would involve ground disturbance and visual intrusion. For example, the OptiSolar project would involve ground disturbance across thousands of acres of land adjacent to the project site, and construction of the Las Vegas regional airport would disturb many more acres. Therefore, it appears that the ISEGS project does have the potential to contribute to a cumulative impact in the Ivanpah Valley. However, project proponents for other future projects in the area may be able to avoid causing substantial adverse changes to CRHR-eligible cultural resources through deliberate project planning, or reduce such impacts to presently unknown cultural resources to less than significant by implementing mitigation measures requiring construction monitoring, evaluation of resources discovered during monitoring, and avoidance or data recovery for resources evaluated to be CRHR-eligible. Such avoidance or mitigation of potential future significant impacts to presently unknown cultural resources would render the potential contribution of the ISEGS project to cumulative impacts on such resources negligible.

Unknown, unrecorded cultural resources may be found at nearly any development site. As they are discovered, resources are recorded and information retrieved. If the nature of the resource requires it, the resource is protected. When discovered, cultural resources are treated in accordance with applicable federal and state laws and regulations as well as in compliance with the mitigation measures and permit requirements applicable to a project. It is not known what cultural resources, if any, would be affected by development of all present and future projects within the Ivanpah Valley, however, it is reasonable to assume that cultural resources exist and could be expected to be uncovered at some of these sites. As would be done during ISEGS construction, should resources be discovered during the construction of current and future projects, they would be subject to legal requirements designed to protect them,

thereby reducing the effect of impacts. Therefore ISEGS impacts, when combined with impacts from past, present and reasonably foreseeable projects would not be significant for presently unknown cultural resources.

Regional Projects

The development of urban, residential, military, and infrastructure uses of land within the geographic extent of regional cumulative impacts has likely resulted in impacts to cultural resources. Many archaeological resources occur within the California Desert Conservation Area that could be destroyed through construction activities of these renewable projects. For example, nearly 12,000 cultural resources have been identified within San Bernardino County (San Bernardino County 2007). Because only 15 percent of San Bernardino County has been surveyed for cultural resources, there is a high potential to discover previously unknown resources. If resources are impacted where the values can be fully recovered through data recovery or other recordation (photography, drawings, and descriptive history), the cumulative impact of these future projects would not be significant. However, even with mitigation of individual projects at specific sites, there would still be a loss of resources due to the large number of acres disturbed.

Buildings and structural sites throughout the desert would also be impacted by the numerous proposed renewable projects. Potential impacts would include physical disturbance or alteration directly as a result of construction activities or diminished visual character of such sites due to the presence of industrial structures. Mitigation would be implemented for each project to minimize impacts.

Construction of the solar and wind projects proposed throughout this region would result in substantial changes in the setting and feeling, and association of the areas in which they are constructed. The current design of these projects would result in a significant cumulative impact to the region. Within the desert region there are numerous traditional use areas, and lands sacred to Native Americans are present. Potential impacts would include physical disturbance or alteration directly as a result of construction activity or diminished visual character of traditional use areas due to the presence of industrial structures. If impacts to traditional use areas would occur at any individual site, mitigation would be implemented to minimize project impacts; however the potential for vast disturbance of the desert would potentially lead to a loss of resources and impacts to visual character, thereby resulting in a significant cumulative impact.

However, as discussed above, there is one built-environment resource that the construction and operation of the ISEGS project would affect, and staff's proposed conditions of certification provide for the mitigation of that impact to that resource. The ISEGS project would, therefore, have minimal potential to combine with the impacts of any of the reasonably foreseeable renewable energy projects shown on Cumulative Impacts Figure 1 and Cumulative Impacts Figure 2 to result in cumulative impacts to known cultural resources.

Unknown, unrecorded cultural resources may be found at nearly any development site. When discovered, cultural resources are treated in accordance with applicable Federal and State laws and regulations as well as in compliance with the mitigation measures

and permit requirements applicable to a project. It is not known what cultural resources, if any, would be affected by development of all present and future projects within southeastern California, southern Nevada, and western Arizona. Because, however, of the large area of proposed development (over one million acres of desert land), it is reasonable to assume that cultural resources exist and would be expected to be uncovered at some of these sites. As would be done during the construction of the ISEGS project, should resources be discovered during construction of any of the proposed solar and wind development projects, they would be subject to legal requirements designed to protect them, thereby reducing the effect of impacts. Additionally, by developing sites with solar reflective mirrors, photovoltaic panels, or wind turbines, the potential also exists for these projects to preclude the potential for discovery of unknown cultural resources. Therefore, although the discovery of unknown cultural resources can be mitigated for individual projects, the scale of future renewable energy development with the potential to disturb unknown resource or to preclude the potential for discovery of unknown discoveries would be significant, and the contribution of the ISEGS project to this cumulative impact would be cumulatively considerable.

Cumulative Impact Conclusion

The ISEGS project would, in combination with reasonably foreseeable projects, contribute to significant local cumulative impacts to at least one known historical resource, the Hoover Dam-to-San Bernardino transmission line (CA-SBR-10315H). Impacts of the ISEGS project would not have the potential to combine with impacts of past, present, and reasonably foreseeable projects to result in a significant contribution to regional cumulative impacts to other known cultural resources, or to either local or regional cumulative impacts to unknown cultural resources. Impacts of the ISEGS project would combine with impacts of proposed solar and wind development projects in southeastern California, southern Nevada, and western Arizona to result in cumulatively considerable impacts to unknown cultural resources.

COMPLIANCE WITH LORS

If the conditions of certification (below) are properly implemented, then the proposed ISEGS project would result in a less-than-significant impact on known, NRHP- and CRHR-eligible resources. The project would therefore be in compliance with all applicable state laws, ordinances, regulations, and standards (LORS) listed in Cultural Resources Table 1.

The County of San Bernardino's General Plan has broad language that declares its goal of preserving and promoting the county-wide preservation of cultural resources, but the only County cultural resources LORS with which a development project must comply, by taking specific actions, apply only to the unincorporated areas of the County. Staff's proposed conditions of certification require specific actions to promote and to effect historic preservation, and to mitigate impacts to CRHR-eligible resources in order to ensure CEQA compliance. Consequently, if ISEGS implements these conditions, its actions would be consistent with the cultural resources goals of the County of San Bernardino.

NOTEWORTHY PUBLIC BENEFITS

Staff has not identified any noteworthy public benefits associated with cultural resources that have been the result of the environmental analyses for the proposed project or that would be the result of the construction, operation, maintenance, closure, or decommissioning of the project.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

BLM and Energy Commission staff have, as of the drafting of the present document, received one comment that explicitly relates to the analysis of cultural resources. The comment is a joint submission by the Wilderness Society and the Natural Resources Defense Council, dated January 23, 2009:

> "The agencies should carefully evaluate the final results of field research to determine whether cultural resources exist in the project area. If cultural resources exist, the agencies should thoroughly analyze the impacts of the ISEGS project to those resources and develop a comprehensive impacts minimization and mitigation plan."

BLM and Energy Commission staff believe that the incorporation of the results of the Reconnaissance Survey and ISEGS-01 Evaluation Protocols (see "September, 2008 Helicopter and Pedestrian Reconnaissance Survey" and "Investigation to Evaluate Archaeological Site ISEGS-01" subsections, above) into this FSA completely address the above joint Wilderness Society and Natural Resources Defense Council comment.

CONCLUSIONS AND RECOMMENDATIONS

This cultural resources analysis concludes that the ISEGS project would have no significant direct or indirect impacts on known or unknown, NRHP- or CRHR-eligible archaeological, ethnographic, or built-environment resources, with implementation of proposed Conditions of Certification **CUL-1** through **CUL-7** and **CUL-10**.

With the adoption and implementation of staff's proposed Conditions of Certification **CUL-8** and **CUL-9**, staff can conclude that the cumulative effect of the proposed project on the one presently known NRHP-eligible and CRHR-listed resource, the Hoover Dam-to-San Bernardino transmission line (CA-SBR-10315H), would be rendered less than cumulatively considerable. Staff therefore recommends that the Commission adopt these conditions.

Staff further recommends that the Commission adopt the following additional cultural resources Conditions of Certification, **CUL-1** through **CUL-7**, and **CUL-10**. These measures are intended to facilitate the identification and assessment of previously unknown archaeological resources encountered during construction-related ground disturbance and to mitigate any significant impacts from the project on any newly found resources assessed as NRHP- or CRHR-eligible. To accomplish this, the conditions provide for the hiring of a Cultural Resources Specialist and archaeological monitors, for cultural resources awareness training for construction workers, for the archaeological

and Native American monitoring of ground-disturbing activities, in particular situations, for the recovery of data from NRHP- or CRHR-eligible discovered archaeological deposits, for the writing of a technical archaeological report on all archaeological activities and findings, and for the curation of recovered artifacts and other data. When properly implemented and enforced, staff believes that these conditions of certification would reduce to less than significant any impacts to previously unknown cultural resources encountered during construction or operation. Additionally, with the adoption and implementation of these conditions, the ISEGS project would be in conformity with all applicable LORS.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of ground disturbance (includes "preconstruction site mobilization;" "construction ground disturbance;" and "construction grading, boring, and trenching," as defined in the General Conditions for this project), the project owner shall obtain the services of a Cultural Resources Specialist (CRS), and one or more alternate CRSs, if alternates are needed. The CRS shall manage all consultation, monitoring, mitigation, curation, and reporting activities required in accordance with the Conditions of Certification (Conditions). The CRS may elect to obtain the services of Cultural Resource Monitors (CRMs) and other technical specialists, if needed, to assist in monitoring, mitigation, and curation activities. The project owner shall ensure that the CRS makes recommendations regarding the eligibility to the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) of any cultural resources that are newly discovered or that may be affected in an unanticipated manner. No ground disturbance shall occur prior to CPM approval of the CRS, unless specifically approved by the BLM's Authorized Officer and the CPM. Approval of a CRS may be denied or revoked for non-compliance on this or other projects.

CULTURAL RESOURCES SPECIALIST

The resumes for the CRS and alternate(s) shall include information demonstrating to the satisfaction of the BLM's Authorized Officer and the CPM that their training and background conform to the U.S. Secretary of Interior Guidelines, as published in the Code of Federal Regulations, 36 CFR Part 61. In addition, the CRS shall have the following qualifications:

1. The CRS's qualifications shall be appropriate to the needs of the project and shall include a background in anthropology, archaeology, history, architectural history, or a related field; and
2. At least three years of archaeological or historic, as appropriate, resource mitigation and field experience in California.

The resume of the CRS shall include the names and telephone numbers of contacts familiar with the work of the CRS on referenced projects, and demonstrate that the CRS has the appropriate education and experience to accomplish the cultural resource tasks that must be addressed during ground disturbance, grading, construction, and operation.

CULTURAL RESOURCES MONITORS

CRMs shall have the following qualifications:

1. a BS or BA degree in anthropology, archaeology, historical archaeology or a related field and one year experience monitoring in California; or
2. an AS or AA degree in anthropology, archaeology, historical archaeology or a related field, and four years experience monitoring in California; or
3. enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historical archaeology or a related field, and two years of monitoring experience in California.

CULTURAL RESOURCES TECHNICAL SPECIALISTS

The resume(s) of any additional technical specialists, e.g., historical archaeologist, historian, architectural historian, and/or physical anthropologist, shall be submitted to the BLM's Authorized Officer and the CPM for approval.

Verification:

1. At least 45 days prior to the start of ground disturbance, the project owner shall submit the resume for the CRS, and alternate(s), if desired, to the BLM's Authorized Officer and the CPM for review and approval.
2. At least 10 days prior to a termination or release of the CRS, or within 10 days after the resignation of a CRS, the project owner shall submit the resume of the proposed new CRS to the BLM's Authorized Officer and the CPM for review and approval. At the same time, the project owner shall also provide to the approved new CRS the AFC and all cultural documents, field notes, photographs, and other cultural materials generated by the project. If there is no alternate CRS in place to conduct the duties of the CRS, a previously approved monitor may serve in place of a CRS so that construction may continue up to a maximum of 3 days without a CRS. If cultural resources are discovered, then construction will remain halted until there is a CRS or alternate CRS to make a recommendation regarding significance.
3. At least 20 days prior to ground disturbance, the CRS shall provide a letter naming anticipated CRMs for the project and stating that the identified CRMs meet the minimum qualifications for cultural resource monitoring required by this Condition. If additional CRMs are obtained during the project, the CRS shall provide additional letters to the BLM's Authorized Officer and the CPM identifying the CRMs and attesting to the qualifications of the CRMs, at least five days prior to the CRMs beginning on-site duties.
4. At least 10 days prior to beginning tasks, the resume(s) of any additional technical specialists shall be provided to the BLM's Authorized Officer and the CPM for review and approval.

5. At least 10 days prior to the start of ground disturbance, the project owner shall confirm in writing to the BLM's Authorized Officer and the CPM that the approved CRS will be available for onsite work and is prepared to implement the cultural resources Conditions.

CUL-2 Prior to the start of ground disturbance, if the CRS has not previously worked on the project, the project owner shall provide the CRS with copies of the AFC, data responses, and confidential cultural resources reports for the project. The project owner shall also provide the CRS, the BLM's Authorized Officer, and the CPM with maps and drawings showing the footprint of the power plant and all linear facilities. Maps shall include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:2000 or 1" = 200') for plotting cultural features or materials. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM. The BLM's Authorized Officer and the CPM shall review submittals and, in consultation with the CRS, approve those that are appropriate for use in cultural resources planning activities. No ground disturbance shall occur prior to CPM approval of maps and drawings, unless specifically approved by the BLM's Authorized Officer and the CPM.

If construction of the project would proceed in phases, maps and drawings, not previously provided, shall be submitted prior to the start of each phase. Written notification identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

At a minimum, the CRS shall consult weekly with the project construction manager to confirm area(s) to be worked during the next week, until ground disturbance is completed, and the project owner shall ensure that the project construction manager is available for such weekly consultations.

The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases. No ground disturbance shall occur prior to CPM approval of maps and drawings, unless specifically approved by the BLM's Authorized Officer and the CPM.

Verification:

1. At least 40 days prior to the start of ground disturbance, the project owner shall provide the AFC, data responses, and confidential cultural resource documents to the CRS, if needed, and the subject maps and drawings to the CRS and CPM. The BLM's Authorized Officer and the CPM will review submittals in consultation with the CRS and approve maps and drawings suitable for cultural resources planning activities.
2. If there are changes to any project related-footprint, revised maps and drawings shall be provided at least 15 days prior to start of ground disturbance and construction for those changes.

3. If project construction is phased, if not previously provided, the project owner shall submit the subject maps and drawings 15 days prior to each phase.

4. On a weekly basis during ground disturbance, a current schedule of anticipated project activity shall be provided to the CRS and CPM by letter, email, or fax.

5. Within five days of identifying changes, the project owner shall provide written notice of any changes to scheduling of construction phase.

CUL-3 Prior to the start of ground disturbance, the project owner shall submit the Cultural Resources Monitoring and Mitigation Plan (CRMMP), as prepared by or under the direction of the CRS, to the BLM's Authorized Officer and the CPM for review and approval. The CPM shall provide the project owner with a model CRMMP to adapt for project use. The CRMMP shall identify general and specific measures to minimize potential impacts to sensitive cultural resources. Implementation of the CRMMP shall be the responsibility of the CRS and the project owner. Copies of the CRMMP shall reside with the CRS, alternate CRS, each monitor, and the project owner's on-site construction manager. No ground disturbance shall occur prior to CPM approval of the CRMMP, unless specifically approved by the BLM's Authorized Officer and the CPM.

The CRMMP shall include, but not be limited to, the following elements and measures:

1. The following statement included in the Introduction: "Any discussion, summary, or paraphrasing of the Conditions in this CRMMP is intended as general guidance and as an aid to the user in understanding the Conditions and their implementation. The Conditions, as written in the Commission Decision, shall supersede any summarization, description, or interpretation of the Conditions in the CRMMP. The Cultural Resources Conditions of Certification from the Commission Decision are contained in Appendix A."

2. A proposed general research design that includes a discussion of archaeological research questions and testable hypotheses specifically applicable to the local prehistory and history of the project area, and a discussion of artifact collection, retention/disposal, and curation policies as related to the research questions formulated in the research design. The research design shall specify that the preferred treatment strategy for any buried archaeological deposits is avoidance. A mitigation plan shall be prepared for any NRHP-eligible resource (as determined by the BLM's Authorized Officer) or any CRHR-eligible resource (as determined by the CPM), impacts to which cannot be avoided. A prescriptive treatment plan may be included in the CRMMP for limited data types.

3. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the ground disturbance and post-ground–disturbance analysis phases of the project.

4. Identification of the person(s) expected to perform each of the tasks, their responsibilities, and the reporting relationships between project construction management and the mitigation and monitoring team.

5. A description of the manner in which Native American observers or monitors will be included, the procedures to be used to select them, and their role and responsibilities.

6. A description of all impact avoidance measures (such as flagging or fencing), to prohibit or otherwise restrict access to sensitive resource areas that may be found during construction and/or operation and may subsequently need to be avoided, and identification of the areas where these measures are to be implemented. The description shall address how these measures would be implemented and how long they would be needed to protect the resources from project-related effects.

7. A statement that all cultural resources encountered shall be recorded on a DPR form 523 and mapped and photographed. In addition, all archaeological materials collected as a result of the archaeological investigations (survey, testing, and data recovery) shall be curated in accordance with the State Historical Resources Commission's "Guidelines for the Curation of Archaeological Collections," into a retrievable storage collection in a public repository or museum.

8. A statement that the project owner will pay all curation fees for artifacts recovered and for related documentation produced during cultural resources investigations conducted for the project. The project owner shall identify three possible curation facilities that could accept cultural resources materials resulting from project activities.

9. A statement that the CRS has access to equipment and supplies necessary for site mapping, photographing, and recovering any cultural resource materials that are encountered during ground disturbance and that cannot be treated prescriptively.

10. A description of the contents and format of the Cultural Resource Report (CRR), which shall be prepared according to ARMR Guidelines.

Verification:

1. Upon approval of the CRS proposed by the project owner, the CPM will provide to the CRS an electronic copy of the model CRMMP.

2. At least 30 days prior to the start of ground disturbance, the project owner shall submit the subject CRMMP to the BLM's Authorized Officer and the CPM for review and approval. Ground disturbance may not commence until the CRMMP is approved, unless specifically approved by the BLM's Authorized Officer and the CPM.

3. At least 30 days prior to the start of ground disturbance, a letter shall be provided to the BLM's Authorized Officer and the CPM indicating that the project owner agrees to pay curation fees for any materials collected as a result of the archaeological investigations (survey, testing, data recovery).

CUL-4 The project owner shall submit the Cultural Resources Report (CRR) to the BLM's Authorized Officer and the CPM for approval. The CRR shall be written by or under the direction of the CRS and shall be provided in the ARMR format. The CRR shall report on all field activities related to the implementation of the CRMMP including dates, times and locations, findings, samplings, and analyses. All survey reports, Department of Parks and Recreation (DPR) 523 forms, and additional research reports not previously submitted to the California Historic Resource Information System (CHRIS) and the State Historic Preservation Officer (SHPO) shall be included as an appendix to the CRR.

If the project owner requests a suspension of ground disturbance and/or construction activities, then a draft CRR that covers all cultural resources activities associated with the project shall be prepared by the CRS and submitted to the BLM's Authorized Officer and the CPM for review and approval on the same day as the suspension/extension request. The draft CRR shall be retained at the project site in a secure facility until ground disturbance and/or construction resumes or the project is withdrawn. If the project is withdrawn, then a final CRR shall be submitted to the BLM's Authorized Officer and the CPM for review and approval at the same time as the withdrawal request.

Verification:

1. Within 90 days after completion of ground disturbance (including landscaping), the project owner shall submit the CRR to the BLM's Authorized Officer and the CPM for review and approval. If any reports have previously been sent to the CHRIS, then receipt letters from the CHRIS or other verification of receipt shall be included in an appendix.
2. Within 90 days after completion of ground disturbance (including landscaping), the project owner shall provide to the BLM's Authorized Officer and the CPM a copy of an agreement with, or other written commitment from, a curation facility that meets the standards stated in the California State Historical Resources Commission's *Guidelines for the Curation of Archaeological Collections*, to accept cultural materials, if any, from this project. Any agreements concerning curation will be retained and available for audit for the life of the project.
3. Within 10 days after CPM approval of the CRR, the project owner shall provide documentation to the BLM's Authorized Officer and the CPM that copies of the CRR have been provided to the SHPO, the CHRIS, the curating institution, if archaeological materials were collected, and to the Chairperson(s) of any Native American groups requesting copies of project-related reports.
4. Within 30 days after requesting a suspension of construction activities, the project owner shall submit a draft CRR to the BLM's Authorized Officer and the CPM for review and approval.

CUL-5 Prior to and for the duration of ground disturbance, the project owner shall provide Worker Environmental Awareness Program (WEAP) training to all new workers within their first week of employment at the project site and on the linear facilities. The training shall be prepared by the CRS, may be conducted by any member of the archaeological team, and may be presented in the form of a video. The CRS shall be available (by telephone or in person) to answer questions posed by employees. The training may be discontinued when ground disturbance, including landscaping, is completed. The training shall include:

1. A discussion of applicable laws and penalties under the law;
2. Samples or visuals of artifacts that might be found in the project vicinity;
3. A discussion of what such artifacts may look like when partially buried, or wholly buried and then freshly exposed;
4. A discussion of what prehistoric and historical archaeological deposits look like at the surface and when exposed during construction, and the range of variation in the appearance of such deposits;
5. Instruction that the CRS, alternate CRS, and CRMs have the authority to halt construction in the area of a discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS;
6. Instruction that employees are to halt work on their own in the vicinity of a potential cultural resources discovery and shall contact their supervisor and the CRS or CRM, and that redirection of work would be determined by the construction supervisor and the CRS;
7. An informational brochure that identifies reporting procedures in the event of a discovery;
8. An acknowledgement form signed by each worker indicating that they have received the training; and
9. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

No ground disturbance shall occur prior to implementation of the WEAP program, unless such activities are specifically approved by the BLM's Authorized Officer and the CPM.

Verification:

1. At least 30 days prior to the beginning of ground disturbance, the CRS shall provide the training program draft text and graphics and the informational brochure to the BLM's Authorized Officer and the CPM for review and approval, and the CPM will provide to the project owner a WEAP Training Acknowledgement form for each WEAP-trained worker to sign.

2. On a monthly basis, the project owner shall provide in the Monthly Compliance Report (MCR) the WEAP Training Acknowledgement forms of persons who have completed the training in the prior month and a running total of all persons who have completed training to date.

CUL-6 The project owner shall ensure that construction is immediately halted should anyone discover buried archaeological materials on the project site or linear facilities (Discovery). Archaeological materials may include, but are not limited to, such items as whole or fragmentary flaked or ground stone tools, stone flaking debris, discolored, fire-altered rock, animal bone, charcoal, ash, discolored, burned earth, rocks and minerals not common to the project site, and fragments of ceramic, glass, or metal. In the event of such a Discovery, the project owner shall ensure the immediate notification of the CRS, who shall either evaluate the NRHP and CRHR eligibility of the Discovery, in person, on the project site, or supervise the evaluations that a CRM or an appropriate cultural resources technical specialist would make of the historical significance of the Discovery, also in person, on the project. The recommendations of significance shall be substantiated by and reported to the BLM's Authorized Officer and the CPM by the CRS. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor, in a manner agreed to by the CRS.

In the event cultural resources that are over 50 years of age or that may be considered NRHP- or CRHR-eligible are found, or impacts to such resources can be anticipated, construction shall be halted or redirected in the immediate vicinity of the Discovery sufficient to ensure that the resource is protected from further impacts. The halting or redirection of construction shall remain in effect until either the CRS, a CRM, or appropriate cultural resources technical specialist has made evaluations of the historical significance of the Discovery, and all of the following have also occurred:

1. The CRS has notified the project owner, and the BLM's Authorized Officer and the CPM have been notified within 24 hours of the Discovery, or by Monday morning if the cultural resources Discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning, including a description of the Discovery (or changes in character or attributes), the action taken (i.e. work stoppage or redirection), recommendations of eligibility, and recommendations for mitigation of any cultural resources Discoveries, whether or not a determination of significance has been made.
2. The CRS has ensured completion of field notes, measurements, and photography for a DPR 523 primary form. The "Description" entry of the 523 form shall include a recommendation on the significance of the find. The project owner shall submit completed forms to the BLM's Authorized Officer and the CPM.
3. The CRS, the project owner, and the BLM's Authorized Officer and the CPM have conferred, and the BLM's Authorized Officer and the CPM have concurred with the recommended eligibility of the Discovery and approved the CRS's proposed data recovery, if any, including the curation of the

artifacts, or other appropriate mitigation; and any necessary data recovery and mitigation have been completed.

4. The CRS, the BLM's Authorized Officer, and the CPM have conferred, and the BLM's Authorized Officer and the CPM have determined whether the Discovery reveals new information about the subsurface archaeological character of the project site that warrants the initiation of monitoring for portions of the project site.

5. When the BLM's Authorized Officer and the CPM make a determination that a Discovery does reveal new information about the subsurface archaeological character of the project site that warrants the initiation of monitoring for portions of the project site, the BLM's Authorized Officer and the CPM shall provide notification, by letter or e-mail, to the project owner and the CRS, where on the project site monitoring shall be necessary and why, and notification that **CUL-7** shall be implemented for the subject portions of the project site.

Verification:

1. At least 30 days prior to the start of ground disturbance, the project owner shall provide the BLM's Authorized Officer, the CPM, and the CRS with a letter confirming that the CRS, alternate CRS, and CRMs have the authority to halt construction activities in the vicinity of a cultural resources Discovery, and that the project owner shall ensure that the CRS notifies the BLM's Authorized Officer and the CPM within 24 hours of a Discovery, or by Monday morning if the cultural resources Discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning.

2. Completed DPR form 523s shall be submitted to the BLM's Authorized Officer and the CPM for review and approval no later than 24 hours following the notification of the BLM's Authorized Officer and the CPM, or 48 hours following the completion of data recordation/recovery, whichever is more appropriate for the subject cultural material.

CUL-7 If there is a discovery of archaeological material, and after the BLM's Authorized Officer and the CPM notify the project owner and the CRS that the initiation of monitoring is necessary for portions of the project site or linear facilities, the project owner shall ensure that the CRS, alternate CRS, or CRMs shall monitor full time on the portions of the project site and linear facilities which the BLM's Authorized Officer and the CPM may specify, and ground disturbance full time on the portions of the laydown areas or other ancillary areas which the BLM's Authorized Officer and the CPM may also specify, to ensure there are no impacts to further undiscovered resources and to ensure that newly found resources are not further impacted in an unanticipated manner.

Full-time archaeological monitoring for this project shall be the archaeological monitoring of all earth-moving activities on the portions of the construction site or the linear facility routes which the BLM's Authorized Officer and the CPM may specify for as long as the activities are ongoing. Full-time archaeological

monitoring shall require one monitor per active earthmoving machine working in archaeologically sensitive areas, as determined by the CRS in consultation with the BLM's Authorized Officer and the CPM. If an excavation area is too large for one monitor to effectively observe the soil removal, one or more additional monitors shall be retained to observe the area.

In the event that the CRS determines that the current level of monitoring is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the level of monitoring shall be provided to the BLM's Authorized Officer and the CPM for review and approval prior to any change in the level of monitoring.

The research design in the CRMMP shall govern the collection, treatment, retention/disposal, and curation of any archaeological materials encountered.

On forms provided by the CPM, CRMs shall keep a daily log of any monitoring and other cultural resource activities and any instances of non-compliance with the Conditions and/or applicable LORS. Copies of the daily logs shall be provided to the BLM's Authorized Officer and the CPM by the CRS as directed by the BLM's Authorized Officer and the CPM. The CRS shall use these logs to compile a monthly summary report on the progress or status of cultural resources-related activities. If there are no monitoring activities, the summary report shall specify why monitoring has been suspended. The CRS or alternate CRS shall report daily to the BLM's Authorized Officer and the CPM on the status of cultural resources-related activities at the project site, unless reducing or ending daily reporting is requested by the CRS and approved by the BLM's Authorized Officer and the CPM.

The CRS, at his or her discretion, or at the request of the BLM's Authorized Officer or the CPM, may informally discuss cultural resource monitoring and mitigation activities with Energy Commission technical staff.

Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS, or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these Conditions.

Upon becoming aware of any incidents of non-compliance with the Conditions and/or applicable LORS, the CRS and/or the project owner shall notify the BLM's Authorized Officer and the CPM by telephone or e-mail within 24 hours. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the Conditions. When the issue is resolved, the CRS shall write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report shall be provided in the next MCR for the review of the BLM's Authorized Officer and the CPM.

A Native American monitor shall be obtained to monitor ground disturbance in areas where Native American artifacts may be discovered. Informational lists of concerned Native Americans and Guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a

monitor shall be given to Native Americans with traditional ties to the area that shall be monitored.

Verification:

1. At least 30 days prior to the start of ground disturbance, the CPM will provide to the CRS an electronic copy of the form to be used as a daily monitoring log.
2. Daily, the CRS shall provide a statement that "no cultural resources over 50 years of age were discovered" to the BLM's Authorized Officer and the CPM as an e-mail or in some other form acceptable to the BLM's Authorized Officer and the CPM. If the CRS concludes that daily reporting is no longer necessary, a letter or e-mail providing a detailed justification for the decision to reduce or end daily reporting shall be provided to the BLM's Authorized Officer and the CPM for review and approval at least 24 hours prior to reducing or ending daily reporting.
3. On a monthly basis, while monitoring is on-going, the project owner shall include in each MCR a copy of the monthly summary report of cultural resources-related monitoring prepared by the CRS. Copies of daily logs shall be retained by the project owner and made available for audit by the BLM's Authorized Officer and the CPM.
4. At least 24 hours prior to implementing a proposed change in monitoring level, documentation justifying the change shall be submitted to the BLM's Authorized Officer and the CPM for review and approval.

CUL-8 Prior to the dismantling, by any party, of any portion of the Hoover Dam-to-San Bernardino transmission line (CA-SBR-10315H) located with the boundaries of the project site, the project owner shall obtain the services of an architectural historian. The project owner shall provide the BLM's Authorized Officer and the CPM with the name and resume of the architectural historian. No ground disturbance shall occur prior to CPM approval of the architectural historian, unless specifically approved by the BLM's Authorized Officer and the CPM.

The resume for the architectural historian shall include names and telephone numbers of contacts familiar with the architectural historian's work and all information needed to demonstrate that the architectural historian has the following qualifications:

1. meets the Secretary of Interior's Professional Standards for architectural history;
2. has at least three years experience in recording twentieth-century industrial structures; and
3. has completed at least one recordation project within the past five years involving coordination with the National Park Service's Heritage Documentation Program (HDP).

Verification:

1. At least 90 days prior to the dismantling of any portion of the Hoover Dam-to-San Bernardino transmission line located within the boundaries of the project site, the project owner shall submit the name and resume of the selected architectural historian to the BLM's Authorized Officer and the CPM for review and approval.

2. At least 75 days prior to the dismantling of any portion of the Hoover Dam-to-San Bernardino transmission line located within the boundaries of the project site, the project owner shall confirm in writing to the BLM's Authorized Officer and the CPM that the approved architectural historian is available for onsite work and provide a date by which the architectural historian will undertake the HAER-type documentation of the tower types and the cabling system of the portion of the Hoover Dam-to-San Bernardino transmission line located within the boundaries of the project site.

CUL-9 Prior to the dismantling, by any party, of any portion of the Hoover Dam-to-San Bernardino transmission line (CA-SBR-10315H) located within the boundaries of the project site, the project owner shall ensure that the approved architectural historian prepares HAER-type documentation of the historic context and historic setting of the resource, and recordation of those physical parts of the Hoover Dam-to-San Bernardino transmission line that are located within the boundaries of the project site. The project owner shall ensure that the architectural historian consults with the HABS/HAER Coordinator in the Pacific West Regional Office of the HDP, in Oakland, and complies with the Coordinator's guidance on the extent and content of documentation appropriate for the Hoover Dam-to-San Bernardino transmission line, as a historical resource under CEQA and as a resource eligible for inclusion in the National Register of Historic Places, and on the format and materials to be used in the documentation. No dismantling of the Hoover Dam-to-San Bernardino transmission line located within the boundaries of the project area shall occur prior to the completion, by the architectural historian, of the recording, in the field, of the historic setting and the portion of the line located within the boundaries of the project site, and the submission to and approval by the BLM's Authorized Officer and the CPM of the draft HAER-type documentation of the Hoover Dam-to-San Bernardino transmission line, unless specifically allowed by the BLM's Authorized Officer and the CPM.

Verification:

1. At least 60 days prior to the dismantling, by any party, of any portion of the Hoover Dam-to-San Bernardino transmission line located within the boundaries of the project site, the project owner shall submit to the BLM's Authorized Officer and the CPM a letter or memorandum from the architectural historian detailing the scope of the HDP-recommended documentation of the resource.

2. At least 30 days prior to the dismantling, by any party, of any portion of the Hoover Dam-to-San Bernardino transmission line located within the boundaries of the project site, the project owner shall provide a copy of the

draft HAER-type documentation of the resource to the BLM's Authorized Officer and the CPM for review and approval.

3. Within 90 days after completion of ground disturbance (including landscaping) the project owner shall include in an appendix to the CRR copies of the transmittal letters for the submission of copies of the final HAER-type documentation of the portion of the Hoover Dam-to-San Bernardino transmission line located within the boundaries of the project site to the California State Library and to at least two local libraries in San Bernardino County, and a copy of the letter of acceptance of the final HAER documentation by the Library of Congress, if accepted by that repository.

4. Alternately, at least 150 days prior to the dismantling, by any party, of any portion of the Hoover Dam-to-San Bernardino transmission line located within the boundaries of the project site, the project owner may submit to the BLM's Authorized Officer and the CPM, for review and approval, a copy of final HAER-type documentation of the portion of the Hoover Dam-to-San Bernardino transmission line located within the boundaries of the project site produced by any party, that meets HAER-type standards. If the project owner chooses this alternative, within 90 days after completion of ground disturbance (including landscaping), the project owner shall include in an appendix to the CRR copies of the transmittal letters for the submission of copies of the alternative final HAER-type documentation to the California State Library and to at least two local libraries in San Bernardino County.

CUL-10 If fill soils must be acquired from a non-commercial borrow site or disposed of to a non-commercial disposal site, unless less-than-five-year-old surveys of these sites for archaeological resources are documented to and approved by the BLM's Authorized Officer and the CPM, the CRS shall survey the borrow and/or disposal site(s) for cultural resources and record on DPR 523 forms any that are identified. When the survey is completed, the CRS shall convey the results and recommendations for further action to the project owner, the BLM's Authorized Officer, and the CPM, who will determine what, if any, further action is required. If the BLM's Authorized Officer and the CPM determine that significant archaeological resources that cannot be avoided are present at the borrow site, all these conditions of certification shall apply. The CRS shall report on the methods and results of these surveys in the CRR.

Verification:

1. As soon as the project owner knows that a non-commercial borrow site and/or disposal site will be used, he/she shall notify the CRS and CPM and provide documentation of previous archaeological survey, if any, dating within the past five years, for CPM approval.

2. In the absence of documentation of recent archaeological survey, **at least 30 days prior** to any soil borrow or disposal activities on the non-commercial borrow and/or disposal sites, the CRS shall survey the site/s for archaeological resources. The CRS shall notify the project owner, the BLM's Authorized Officer, and the CPM of the results of the cultural resources survey, with recommendations, if any, for further action.

CULTURAL RESOURCES ACRONYM GLOSSARY

IVANPAH SOLAR ENERGYGENERATING SYSTEM

AFC	Application for Certification
ARMR	Archaeological Resource Management Report
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
Conditions	Conditions of Certification
CRHR	California Register of Historical Resources
CRM	Cultural Resources Monitor
CRMMP	Cultural Resources Monitoring and Mitigation Plan
CRR	Cultural Resource Report
CRS	Cultural Resources Specialist
DPR 523	Department of Parks and Recreation cultural resources inventory form
FSA	Final Staff Assessment
LORS	laws, ordinances, regulations, and standards
MCR	Monthly Compliance Report
MLD	Most Likely Descendent
NAHC	Native American Heritage Commission
NRHP	National Register of Historic Places
OHP	Office of Historic Preservation
PSA	Preliminary Staff Assessment
SHPO	State Historic Preservation Officer
Staff	Energy Commission cultural resources technical staff

REFERENCES

The *tn: 00000* in a reference below indicates the transaction number under which the item is catalogued in the Energy Commission's Docket Unit. The transaction number allows for quicker location and retrieval of individual items docketed for a case or used for ease of reference and retrieval of exhibits cited in briefs and used at Evidentiary Hearings.

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