IMPERIAL VALLEY SOLAR PROJECT
(Formerly SES Solar Two)

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Supplemental Staff Assessment, Part II

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IMPERIAL VALLEY SOLAR PROJECT (08-AFC-5)
SUPPLEMENTAL STAFF ASSESSMENT, PART II

EXECUTIVE SUMMARY

Christopher Meyer

INTRODUCTION

Imperial Valley Solar, LLC (formerly Stirling Energy Systems Solar Two, LLC) is seeking approval to construct and operate the Imperial Valley Solar (formerly the Stirling Energy Systems Solar Two) Project and its ancillary facilities. The applicant is a wholly owned subsidiary of Tessera Solar. The main objective of the Imperial Valley Solar (IVS) Project is to provide clean, renewable, solar-powered electricity to the State of California. The electricity from the IVS Project would assist the State in meeting its objectives as mandated by the California Renewable Portfolio Standard (RPS) Program and the California Global Warming Solutions Act. The IVS Project would also address other local mandates adopted by California's electric utilities for the provision of renewable energy.

The applicant has submitted an Application for Certification (AFC) to the California Energy Commission (Energy Commission) for the proposed project. The Energy Commission is the lead State agency responsible for evaluating the environmental effects of project and for complying with the California Environmental Quality Act (CEQA). The project proposes the use of land managed by the United States Department of the Interior, Bureau of Land Management (BLM); therefore the applicant has submitted a request for a right-of-way grant to the BLM. The BLM is the federal lead agency for the evaluation of project effects and compliance of the proposed project with the requirements of the National Environmental Policy Act (NEPA) related to possible BLM discretionary actions related to the right-of-way grant request.

The BLM and the Energy Commission prepared separate final documents for compliance with NEPA and CEQA, respectively. Specifically, the BLM published the Final Environmental Impact Statement (FEIS) on July 28, 2010 and the Energy Commission published Part I of the Supplemental Staff Assessment (SSA) on July 7, 2010. Additional time was necessary for the completion of the Cultural Resources section of the SSA, which is being published here as the SSA, Part II.

This document is only the Cultural Resources section of the SSA. All other technical areas and summaries of Energy Commission staff's analysis can be found in the July 7, 2010 Supplemental Staff Assessment.

SUMMARY OF PROJECT RELATED IMPACTS

Executive Summary Table 1 (comparable to Executive Summary Table 4 in the SSA Part I) summarizes the potential short-term, long-term and cumulative adverse impacts of the proposed IVS Project, the anticipated mitigation and conditions of certification, and the level of significance of the impacts after mitigation, under CEQA.

Executive Summary Table 1
Summary of Potential Short-Term, Long-Term, and Cumulative Adverse Impacts

Environmental Parameter	Complies with Applicable LORS	Short and Long Term Adverse Impacts	Cumulative Adverse Impacts	Mitigation and Conditions of Certification	CEQA Level of Significance After Mitigation
Cultural Resources	Yes	**Significant short term or long term adverse impacts with mitigation/ Conditions of Certification incorporated**	**Cumulative adverse impacts**	**CUL-1**	**Significant and unavoidable**

C. ENVIRONMENTAL ANALYSIS

C.3 - CULTURAL RESOURCES AND NATIVE AMERICAN VALUES

Testimony of Michael D. McGuirt

C.3.1 SUMMARY OF CONCLUSIONS

On the basis of a 25 % sample of the cultural resources inventory of the project area of analysis, staff concludes that the Imperial Valley Solar Project would have significant impacts impacts on a presently unknown subset of approximately 330 known prehistoric and historical surface archaeological resources, may have significant impacts on an unknown number of buried archaeological deposits, many of which may be determined historically significant (i.e., eligible for the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR)) under the programmatic agreement currently under development as part of the Bureau of Land Management's Section 106 consultation process, and may have further significant impacts on ethnographic resources. The adoption and implementation of Condition of Certification **CUL-1** would reduce the potential impacts of the proposed action on the information values of the archaeological resources in the project area of analysis to less than significant under the California Envinronmental Quality Act (CEQA), would resolve analogous impacts under Section 106 of the National Historic Preservation Act, and would further ensure that the proposed action would, in this regard, be in conformity with all applicable laws, ordinances, regulations, and standards. The adoption and implementation of **CUL-1** would lessen, although not necessarily substantially, the significant impacts of the proposed action on the associative values of the archaeological and ethnographic resources in the project area of analysis. Significant impacts to these latter values may be unmitigable.

C.3.2 INTRODUCTION

This cultural resources assessment identifies the potential impacts of the Imperial Valley Solar (IVS) Project on cultural resources. Cultural resources are defined under federal and state law as including archaeological sites, buildings, structures, objects, and districts. Three kinds of cultural resources, classified by their origins, are considered in this assessment: prehistoric, ethnographic, and historic.

Prehistoric archaeological resources are associated with the human occupation and use of California prior to enforced European contact. 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 represent 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, both archaeological and architectural, are associated with Euro-American exploration and settlement of an area and the beginning of a written historical record. They may include archaeological deposits, sites, structures, traveled ways, artifacts, or other evidence of human activity. Under federal and state historic preservation law, historic-period cultural resources must, under most circumstances, be at least 50 years old to have the potential to be of sufficient historical importance to merit eligibility for the NRHP and the CRHR. A resource less than 50 years of age must be of exceptional historical importance to be considered for the NRHP.

Groupings of historic-period resources are also recognized as historic districts and as historic vernacular landscapes. Under federal and state laws, historic cultural resources must be greater than 50 years old to be considered of potential historic importance. A resource less than 50 years of age may be historically important if the resource is of exceptional importance in history.

For the IVS Project, staff provides an overview of the environmental setting and history of the project area, a representative sample of the inventory of the cultural resources identified in the project area for the proposed action and the nearby vicinity, and an analysis of the potential impacts to cultural resources from the proposed project using criteria from the National Environmental Policy Act (NEPA), Section 106 of the National Historic Preservation Act (Section 106), and the California Environmental Quality Act (CEQA).

C.3.3 METHODOLOGY AND THRESHOLDS FOR DETERMINING ENVIRONMENTAL CONSEQUENCES

The purpose of the present cultural resources analysis is to provide evidence of the ongoing public process by which the Energy Commission and the Bureau of Land Management (BLM) are jointly complying with local, State, and Federal regulations to which each agency is variously subject. The Energy Commission, pursuant to section 25519, subsection (c) of the Warren-Alquist Act of 1974 (Act), is the lead agency for the purpose of complying with CEQA in relation to the certification of the proposed facility and the site on which the facility would operate, and is further responsible, pursuant to section 25525 of the Act, for ensuring that the facility would conform with applicable State, local, or regional standards, ordinances, or laws. The BLM is the lead agency for the purpose of complying with NEPA, as the Federal government considers the environmental implications of the proposed action, and has further obligations to comply with Section 106 of the National Historic Preservation Act of 1966, as amended (16 USC 470(f)) (NHPA), and other Federal historic preservation programs.

The structure of the cultural resources analysis for the proposed action accommodates both the primary need of the Energy Commission to demonstrate, under CEQA, a consideration of the potential for the project to affect cultural resources and the primary needs of the BLM to conduct similar analyses under NEPA and Section 106. (Each of these three regulatory programs uses slightly different terminology to refer to the proposed action. Clarifications on the use of “proposed action,” “proposed project,” and “undertaking” may be found in the “Cultural Resources Glossary” subsection, below.) The present analysis is intended to fulfill the largely parallel goals of the three regulatory programs through the execution of five basic analytic phases. The initial phase is the determination of the appropriate geographic extent of the analysis for the proposed action and for each alternative action under consideration. The second phase is to produce an inventory of the cultural resources in each such geographic area. The third phase is to determine whether particular cultural resources in an inventory are historically significant, unless resources can be avoided by construction. The fourth phase is to assess the character and the severity of the impacts of the proposed or alternative actions on the historically significant cultural resources that cannot be avoided in each respective inventory. And the final phase is to propose measures that would resolve significant impacts. The details of each of these phases follow below and provide the parameters of the present analysis.

C.3.3.1 THE PROJECT AREA OF ANALYSIS AND THE AREA OF POTENTIAL IMPACTS

A useful precursor to a cultural resources analysis under CEQA and NEPA and a requisite part of the Section 106 process (36 CFR Part 800) is to define the appropriate geographic limits for an analysis. The area that Energy Commission staff typically considers when identifying and assessing impacts to cultural resources under CEQA is referred to here as the "project area of analysis." Energy Commission staff defines the project area of analysis as the area within and surrounding a project site and associated linear facility corridors. The area reflects the minimum standards set out in the Energy Commission Power Plant Site Certification Regulations (Cal. Code Regs., tit. 20, § 1701 et seq., appen. B, subd. (g)(2)) and is sufficiently large and comprehensive in geographic area to facilitate and encompass considerations of archaeological, ethnographic, and built-environment resources. The project area of analysis is a composite, though not necessarily contiguous geographic area that accommodates the analysis of each of these resource types:

- For archaeological resources, the project area of analysis is minimally defined as the project site footprint, plus a buffer of 200 feet, and the project linear facilities routes, plus a buffer of 50 feet to either side of the rights-of way for these routes.
- For ethnographic resources, the project area of analysis is expanded to take into account traditional use areas and traditional cultural properties which may be far-ranging, including views that contribute to the significance of the property. These resources are often identified in consultation with Native Americans and other ethnic groups, and issues that are raised by these groups may define the area of analysis.
- For built-environment resources, the project area of analysis is confined to one parcel deep from the project site footprint in urban areas, but in rural areas is expanded to include a half-mile buffer from the project site and above-ground linear facilities to encompass resources whose setting could be adversely affected by industrial development.
- For a historic district or a cultural landscape, staff defines the project area of analysis based on the particulars of each siting case (i.e., specific to that project).

The BLM concludes here that the project area of analysis concept provides an appropriate areal scope for the consideration of cultural resources under NEPA and is consistent with the definition of the area of potential impacts (APE) in the Section 106 process (36 CFR § 800.16(d)). The project area of analysis will, therefore, be equivalent to the APE for the purpose of the present discussion and analysis.

C.3.3.2 INVENTORY OF CULTURAL RESOURCES IN PROJECT AREA OF ANALYSIS

A cultural resources inventory specific to each proposed or alternative action under consideration is a necessary step in the staff effort to determine whether each such action may cause, under CEQA, a substantial adverse change in the significance of any cultural resources that are on or would qualify for the California Register of Historical Resources (CRHR), may, under NEPA, significantly affect important historic and cultural aspects of our national heritage, or may, under Section 106, adversely affect any cultural resources that are on or would qualify for the NRHP.

The development of a cultural resources inventory entails working through a sequence of investigatory phases to establish the universe of cultural resources that will be the focus of the analyses of each proposed or alternative action. Generally the research process proceeds from the known to the unknown. These phases typically involve doing background research to identify known cultural resources, conducting fieldwork to collect requisite primary data on not-yet-identified cultural resources in the vicinity of an action, and assessing the results of any geotechnical studies or environmental assessments completed for a project site. The results of this research then support the development of determinations of historical significance for the cultural resources that are found.

C.3.3.3 DETERMINING THE HISTORICAL SIGNIFICANCE OF CULTURAL RESOURCES

A key part of a cultural resources analysis under CEQA, NEPA, or Section 106 is to determine which of the cultural resources that a proposed or alternative action may affect, are important or historically significant (each of these three regulatory programs uses slightly different terminology to refer to historically significant cultural resources; clarifications on the use of the terms "*historical resource*," "*important historic and cultural aspects of our national heritage*," and "*historic property*" may be found in the "Cultural Resources Glossary" subsection, of this report). Subsequent impacts assessments are only made for those cultural resources that are determined to be historically significant. Cultural resources that can be avoided by construction may remain unevaluated. Unevaluated cultural resources that cannot be avoided are treated as eligible when determining impacts. The criteria for evaluation and the requisite thresholds of resource integrity that are, taken together, the measures of historical significance, vary among the three regulatory programs.

Evaluation of Historical Significance under CEQA

CEQA requires the Energy Commission, as a lead agency, to evaluate the historical significance of cultural resources by determining whether or not they meet several sets of specified criteria. Under CEQA, the definition of a historically significant cultural resource is that it is eligible for listing in the CRHR, and such a cultural resource is referred to as a "historical resource," which is 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" (Cal. Code Regs., tit. 14, § 15064.5(a)). The term, "historical resource," therefore, indicates a cultural resource that is historically significant and eligible for listing in the CRHR.

Consequently, under the CEQA Guidelines, to be historically significant, a cultural resource must meet 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,[1] a resource must meet at least one (and may meet more than one) of the following four criteria (Pub. Resources Code, § 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 (Cal. Code Regs., tit. 14, § 4852(c)).

Additionally, cultural resources listed in or formally determined eligible for the NRHP and California Registered Historical Landmarks numbered No. 770 and up are automatically listed in the CRHR and are therefore also historical resources (Pub. Resources Code, § 5024.1(d)). Even if a cultural resource is not listed or determined to be eligible for listing in the CRHR, CEQA allows a lead agency to make a determination as to whether it is a historical resource (Pub. Resources Code, § 21084.1).

Evaluation of Historical Significance under NEPA

NEPA establishes national policy for the protection and enhancement of the environment. Part of the function of the Federal Government in protecting the environment is to "preserve important historic, cultural, and natural aspects of our national heritage." Cultural resources need not be determined eligible for the NRHP as in the National Historic Preservation Act (NHPA) of 1966 (as amended) to receive consideration under NEPA. NEPA is implemented by regulations of the Council on Environmental Quality, 40 CFR 1500-1508. NEPA provides for public participation in the consideration of cultural resources issues, among others, during agency decision-making.

[1] 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 potential five-year lag in the planning process.

Evaluation of Historical Significance under Section 106 (Eligibility of Cultural Resources for Inclusion in the NRHP)

The federal government has developed laws and regulations designed to protect cultural resources that may be affected by actions undertaken, regulated, or funded by federal agencies. Cultural resources are considered during federal undertakings chiefly under Section 106 of NHPA of 1966 (as amended) through one of its implementing regulations, 36 Code of Federal Regulations (CFR) CFR 800 (Protection of Historic Properties). Properties of traditional religious and cultural importance to Native Americans are considered under Section 101(d)(6)(A) of NHPA.

Section 106 of NHPA (16 United States Code [USC] 470f) requires federal agencies to consider the impacts of their undertakings on any district, site, building, structure, or object that is included in or eligible for inclusion in the NRHP and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings (36 CFR Part 800.1). Under Section 106, the significance of any adversely affected cultural resource is assessed and mitigation measures are proposed resolve impacts. Significant cultural resources (historic properties) are those resources that are listed in or are eligible for listing on the NRHP per the criteria listed at 36 CFR 60.4 (Advisory Council on Historic Preservation 2000) and are presented in the next subsection below.

NHPA of 1966 established the ACHP and State Historic Preservation Officers (SHPO) to assist federal and State officials regarding matters related to historic preservation. As previously mentioned above, the administering agency, the ACHP, has authored regulations implementing Section 106 that are located in 36 CFR Part 800, *Protection of Historic Properties* (recently revised, effective January 11, 2001). 36 CFR Part 800 provides detailed procedures, called the Section 106 process, by which the assessment of impacts on archaeological and historical resources, as required by the Act, is implemented.

Given that the proposed IVS Project is located on lands managed by BLM and requires authorization by the BLM, the proposed action is considered an undertaking, and therefore must comply with the NHPA and implementing regulations. NEPA addresses compliance with the NHPA, and the required environmental documentation, whether it is an Environmental Assessment (EA) or an Environmental Impact Statement (EIS), must discuss cultural resources. It is important to recognize, however, that project compliance with NEPA does not mean the project is in compliance with the NHPA.

According to the NHPA (36 CFR Part 800), three steps are required for compliance: (1) identification of significant resources that may be affected by an undertaking; (2) assessment of project impacts on those resources; and (3) development and implementation of mitigation measures to offset or eliminate adverse impacts. All three steps require consultation with interested Native American tribes, local governments, and other interested parties.

Identification and National Register of Historic Places Evaluation

36 CFR Part 800.3 discusses the consultation process. Section 800.4 sets out the steps the ACHP must follow to identify historic properties. 36 CFR Part 800.4(c)(1) outlines the process for NRHP eligibility determinations.

The Historic Sites, Buildings and Antiquities Act of 1935 required the survey, documentation, and maintenance of historic and archaeological sites in an effort to determine which resources commemorate and illustrate the history and prehistory of the United States. The NHPA expanded on this legislation and assigned the responsibility for carrying out this policy to the United States Department of the Interior, National Park Service (NPS). Per NPS regulations, 36 CFR Part 60.4, and guidance published by the NPS, *National Register Bulletin, Number 15, How to Apply the National Register Criteria for Evaluation*, different types of values embodied in districts, sites, buildings, structures, and objects are recognized. These values fall into the following categories:

1. Associate Value (Criteria A and B): Properties significant for their association with or linkage to events (Criterion A) or persons (Criterion B) important in the past.

2. Design or Construction Value (Criterion C): Properties significant as representatives of the man-made expression of culture or technology.

3. Information Value (Criterion D): Properties significant for their ability to yield important information about prehistory or history.

The quality of *significance* in American history, architecture, archaeology, engineering and culture is present in districts, sites, buildings, structures, and objects that possess *integrity* of location, design, setting, materials, workmanship, feeling and association. Cultural resources that are determined eligible for listing in the NRHP, along with SHPO concurrence, are termed “historic properties” under Section 106, and are afforded the same protection as sites listed in the NRHP.

C.3.3.4 ASSESSING ACTION IMPACTS

The core of a cultural resources analysis under CEQA, NEPA, or Section 106 is to assess the character of the impacts that a proposed or alternative action may have on historically significant cultural resources. The analysis takes into account 3 primary types of potential impacts which each of the three above regulatory programs defines and handles in slightly different ways. The three types of potential impacts include direct, indirect, and cumulative impacts. Once the character of each potential effect of a proposed or alternative action has been assessed, a further assessment is made as to whether each such impact is significant, relative to specific regulatory criteria under CEQA, NEPA, and Section 106.

Direct and Indirect Impacts

Direct and indirect impacts are those that are more clearly and immediately attributable to the implementation of proposed or alternative actions. Direct and indirect impacts are conceptually similar under CEQA and NEPA. The uses of the concepts vary under Section 106 relative to their uses under CEQA and NEPA as discussed below.

Direct and Indirect Impacts under CEQA

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 built-environment resources 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.

Direct and Indirect Impacts under Section 106

The Section 106 regulation narrows the range of direct impacts and broadens the range of indirect impacts relative to the definitions of the same terms under CEQA and NEPA. The regulatory definition of “effect,” pursuant to 36 CFR § 800.16(i), is that the term “means alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the NRHP.” In practice, a “direct effect” under Section 106 is limited to the direct physical disturbance of a historic property. Impacts that are immediate but not physical in character, such as visual intrusion, and reasonably foreseeable impacts that may occur at some point subsequent to the implementation of the proposed undertaking are referred to in the Section 106 process as “indirect impacts.”

Cumulative Impacts

Cumulative Impacts are slightly different concepts under CEQA and NEPA, and are, under Section 106, undifferentiated as an aspect of the potential impacts of an undertaking, of a proposed or alternative action. The consideration of cumulative impacts reaches beyond the project area of analysis or the area of potential impacts. It is a consideration of how the impacts of a proposed or alternative action in those areas contributes or does not contribute to the degradation of a resource group or groups that is or are common to the project area of analysis and the surrounding area or vicinity.

Cumulative Impacts under CEQA

A cumulative impact under CEQA refers to a proposed project's incremental impacts considered over time and taken together with those of other, nearby, past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project (Pub. Resources Code sec. 21083; Cal. Code Regs., tit. 14, secs. 15064(h), 15065(a)(3), 15130, and 15355). Cumulative impacts to cultural resources in a project vicinity could occur if any other existing or proposed projects, in conjunction with the proposed project, had or would have impacts on cultural resources that, considered together, would be significant. The previous ground disturbance from prior projects and the ground disturbance related to the future construction of a proposed project and other proposed projects in the vicinity could have a cumulatively considerable effect on archaeological deposits, both prehistoric and historic. The alteration of the natural or cultural setting which could be caused by the construction and operation of a proposed project and other proposed projects in the vicinity could be cumulatively considerable, but may or may not be a significant impact to cultural resources.

Cumulative Impacts under Section 106

The Section 106 regulation makes explicit reference to cumulative impacts only in the context of a discussion of the criteria of adverse effect (36 CFR § 800.5(a)(1)). Cumulative impacts are largely undifferentiated as an aspect of the potential impacts of an undertaking. Such impacts are enumerated and resolved in conjunction with the consideration of direct and indirect impacts.

Assessing the Significance of Action Impacts

Once the character of the impacts that proposed or alternative actions may have on historically significant cultural resources has been determined, the severity of those impacts needs to be assessed. CEQA, NEPA, and Section 106 each have different definitions and tests that factor into decisions about how severe, how significant the impacts of particular actions may be.

Significant Impacts under CEQA

Under CEQA, “a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment” (Pub. Resourced Code, § 21084.1). Thus, staff analyzes whether a proposed project would cause a substantial adverse change in the significance, that is, the CRHR eligibility, of the subset of the historical resources in the cultural resources inventory for a project area that the proposed project demonstrably has the potential to effect. The degree of significance of an impact depends on:

- 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.

Adverse Effects under Section 106

In accordance with 36 CFR Part 800.5 of the ACHP's implementing regulations, which describes criteria for adverse effects, impacts on cultural resources are considered significant if one or more of the following conditions would result from implementation of the proposed action:

An undertaking has an effect on a historic property when the undertaking may alter characteristics of the property that may qualify the property for inclusion in the NRHP. For the purpose of determining the type of effect, alteration to features of a property's location, setting, or use may be relevant, depending on the property's significant characteristics, and should be considered.

An undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include, but are not limited to:

1. Physical destruction, damage, or alteration of all or part of the property
2. Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the NRHP
3. Introduction of visual, audible, or atmospheric elements that are out of character with the property or that alter its setting
4. Neglect of the property, resulting in its deterioration or destruction
5. Transfer, lease, or sale of the property

Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the NRHP. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative. A formal effect finding under Section 106 relates to the proposed or alternative action as a whole rather than relating to individual resources.

C.3.3.5 RESOLVING SIGNIFICANT IMPACTS

The concluding phase in a cultural resources analysis, whether under CEQA, NEPA, or Section 106, is to resolve those impacts of a proposed or alternative action that have been found to be significant or adverse. The terminology used to describe the process of impacts resolution differs among the three regulatory programs. The resolution of significant impacts under CEQA involves the development of mitigation measures the implementation of which would minimize any such impacts (14 CCR § 15126.4).

Mitigation under NEPA includes proposals that avoid or minimize any potential significant effects of a proposed or alternative action on the quality of the human environment (40 CFR § 1502.4). The definition of mitigation in the NEPA regulation includes the development of measures that would avoid, minimize, or rectify significant effects, progressively reduce or eliminate such effects over time, or provide compensation for such effects (40 CFR § 1508.20). The Section 106 process directs the resolution of adverse effects through the development of proposals to avoid, minimize, or otherwise mitigate such effects (36 CFR § 800.6(a)).

The present analysis seeks to resolve the potentially significant impacts of proposed and alternative actions on significant cultural resources (i.e., historical resources/historic properties) through the development of measures that satisfy the common conceptual threads of impacts resolution in CEQA, NEPA, and Section 106. Energy Commission staff here proposes that the Energy Commission fulfill the bulk of its obligation under CEQA to resolve any potentially significant impacts that the proposed or alternative actions may have on cultural resources by making the applicant's compliance with the terms of the BLM's programmatic agreement (PA) under Section 106 a condition of certification (**CUL-1**). The applicant's implementation of the terms of the PA would ensure compliance with applicable laws, ordinances, regulations, and standards (LORS), in addition to compliance with CEQA, NEPA, and Section 106.

Programmatic Agreement (PA)

In accordance with 36 CFR § 800.14(b), PAs are used for the resolution of adverse impacts for complex project situations and when impacts on significant cultural resources, on historic properties cannot be fully determined prior to approval of a proposed action. The BLM has been developing a PA in consultation with the ACHP, the SHPO, the U.S. Army Corps of Engineers, NPS, the Energy Commission, Indian tribes and other Native American groups that attach religious and cultural significance to historic properties that the proposed action may affect, and other individuals and organizations with a demonstrated interest in the proposed action. The PA will govern the completion of the identification and evaluation of cultural resources, as well as the resolution of any adverse impacts on significant cultural resources that may result from the proposed action.

As a result of the anticipated impacts of the proposed project on significant cultural resources and the broad extent of the APE, a PA among the BLM, NPS, the U.S. Army Corps of Engineers, the ACHP, the SHPO, the Energy Commission, Indian tribes and other Native American groups, and the public is advisable. Treatment plans regarding significant cultural resources that cannot be avoided by project construction will be developed in consultation among these consulting parties, as stipulated in the PA.

The BLM initiated formal consultation with the ACHP and the SHPO on the development of a PA for the IVS Project on August 25, 2009. The ACHP replied on September 22, 2009 that they would participate in the Section 106 consultation on the project. By letter of August 25, 2009, the BLM also issued a formal invitation to the Energy Commission to participate in the development of the PA as an Invited Signatory (see 36 CFR § 800.6(c)(2)) so that the Energy Commission might be able to use the Section 106 consultation process, in part, to comply with CEQA. The Energy

Commission accepted this invitation on October 21, 2009 and has been wholly engaged in the subsequent development of the document and the process that the document enacts.

Due to the presence in the APE of the Juan Bautista de Anza National Historic Trail (Anza Trail) and jurisdictional waters as defined by Section 404 of the Clean Water Act, NPS and the U.S. Army Corps of Engineers, respectively, also have the responsibility to comply with Section 106. NPS and the U.S. Army Corps of Engineers have chosen, in accordance with 36 CFR § 800.2(a)(2), to rely on the BLM as the lead Federal agency for the consultation. Their participation in the present Section 106 consultation as Invited Signatories acknowledges their respective NHPA obligations.

Other formal consulting parties to the PA at this time include the National Trust for Historic Preservation and Edie Harmon. The BLM has also been informally consulting with many additional individuals and organizations on this project. The following Indian tribes and Native American organizations have been invited to be consulting parties to the PA as well:

- Campo Kumeyaay Nation
- Cocopah Indian Tribe
- Quechan Indian Tribe
- Ewiiaapaayp Band of Kumeyaay Indians
- Jamul Indian Village
- Kwaaymii Laguna Band of Indians
- La Posta Band of Kumeyaay Indians
- Manzanita Band of Kumeyaay Indians
- San Pasqual Band of Diegueño Indians
- Santa Ysabel Band of Diegueño Indians
- Ah-Mut Pipa Foundation
- Kumeyaay Cultural Repatriation Committee

A draft of a PA for the proposed action has been under active development since December 2009. The process to develop the draft began with a kick-off meeting in El Centro, California on December 4, 2009. Participants in the meeting included the BLM, the U.S. Army Corps of Engineers, NPS, ACHP, SHPO, the Energy Commission, the National Trust for Historic Preservation, the Cocopah Indian Tribe, Quechan elder Preston Arroweed and other Quechan, Kwaaymii Laguna Band of Mission Indians elder Carmen Lucas, Tessera Solar (applicant), members of the public, and consultants to the BLM and the applicant. One outcome of the kick-off meeting was the formation of a core working group whose mandate was to develop the first and subsequent drafts of the PA for the review and comment of the broader group of consulting parties. The working group participants have been the BLM, SHPO, the Energy Commission, the Cocopah Indian Tribe, and consultants to the BLM and the applicant. The working group held teleconferences and met several times from December 2009 through April 2010, and offered the first draft of the PA to the balance of the consulting parties on April 23, 2010 for a 45-day review period which ended on May 7, 2010. The BLM held a meeting in El Centro on May 18, 2010 to discuss the first draft comments, and sent out a revised draft document on May 28, 2010 for a second, 30-day review period which ended on June 25, 2010. The PA is presently undergoing further revision to reflect the second round of comments. The May 28 revised draft may be found as appendix B to this analysis. It serves as a reliable approximation of the ultimate document which is scheduled for execution in September 2010, prior to the BLM's issuance of a record of decision under NEPA on the applicant's application for a right-of-way grant for the proposed action.

C.3.3.6 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Projects licensed by the Energy Commission are reviewed to ensure compliance with all applicable laws. Although the Energy Commission has pre-emptive authority over local laws, it typically ensures compliance with local laws, ordinances, regulations, standards, plans, and policies. The BLM is responsible for compliance with NEPA and Section 106 of the NHPA.

LORS applicable to the IVS Project are in Cultural Resources Table 1 below.

Cultural Resources Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
Federal	
National Historic Preservation Act of 1966, as amended, 16 USC 470(f)	Section 106 of the Act requires Federal agencies to take into account the effects of a proposed action on cultural resources (historic properties) and afford the Advisory Council on Historic Preservation the opportunity to comment.
36 CFR Part 800 (as amended August 5, 2004),	Implementing regulations of Section 106 of the National Historic Preservation Act
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 archaeological 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].

Applicable Law	Description
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 Archaeology and Historic Preservation. These are considered to be the appropriate professional methods and techniques for the preservation of archaeological 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.
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 Management (BLM), the California Desert Conservation Area (CDCA) Plan 1980 as amended – Cultural Resources Element Goals	1. Broaden the archaeological 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 be avoided.
State	
California Environmental Quality Act (CEQA), Sections 21000 et seq. of the Public Resources Code (PRC) with Guidelines for implementation codified in the California Code of Regulations (CCR), Title 14, Chapter 3, Sections 15000 et seq.	CEQA requires that state and local public agencies to identify the environmental impacts of the proposed discretionary activities or projects, determine if the impacts will be significant, and identify alternatives and mitigation measures that will substantially reduce or eliminate significant impacts to the environment. Historical resources are considered a part of the environment and a project that may cause a substantial adverse effect on the significance of a historical resource is a project that may have a significant effect on the environment. The definition of "historical resources" is contained in Section 15064.5 of the CEQA Guidelines.

Applicable Law	Description
AB 4239, 1976	Established the Native American Heritage Commission (NAHC) as the primary government agency responsible for identifying and cataloging Native American cultural resources. The bill authorized the Commission to act in order to prevent damage to and insure Native American access to sacred sites and authorized the commission to prepare an inventory of Native American sacred sites located on public lands.
Public Resources Code 5097.97	No public agency, and no private party using or occupying public property, or operating on public property, under a public license, permit, grant, lease, or contract made on or after July 1, 1977, shall in any manner whatsoever interfere with the free expression or exercise of Native American religion as provided in the United States Constitution and the California Constitution; nor shall any such agency or party cause severe or irreparable damage to any Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine located on public property, except on a clear and convincing showing that the public interest and necessity so require.
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	
Imperial County General Plan, Land Use Element, 2008, Protection of Environmental Resources, Goal 9, Objective 9.1, Page 42	Goal: Identify and Preserve the significant natural, cultural, and community character resources and the County's air and water quality. Objective: Preserve as open space those lands containing watersheds, aquifer recharge areas, floodplains, important natural resources, sensitive vegetation, wildlife habitats, historic and prehistoric sites, or lands which are subject to seismic hazards and establish compatible minimum lot sizes.
Imperial County General Plan, Conservation and Open Space Element, Goals and Objectives, Preservation of Cultural Resources, Page 48	Goal 3: Important prehistoric and historic resources shall be preserved to advance scientific knowledge and maintain the traditional historic element of the Imperial Valley landscape. Objective 3.1: Protect and preserve sites of archaeological, ecological, historical, and scientific value, and/or cultural significance.

Applicable Law	Description
Imperial County General Plan, Conservation and Open Space Element, Implementation Programs and Policies, Cultural Resources Conservation, Pages 57–58	Programs: The County will use the environmental impact report process to conserve cultural resources. Public awareness of cultural heritage will be stressed. All information and artifactual resources recovered in this process will be stored in an appropriate institution and made available for public exhibit and scientific review. Encourage the use of open space easements in the conservation of high value cultural resources. Consider measures which would provide incentives to report archaeological discoveries immediately to the Imperial Valley College – Baker Museum. Coordinate with appropriate federal, state, and local agencies to provide adequate maps identifying cultural resource locations for use during development review. Newly discovered archaeological resources shall be added to the "Sensitivity Map for Cultural Resources." Discourage vandalism of cultural resources and excavation by persons other than qualified archaeologists. The County shall study the feasibility of implementing policies and enacting ordinances toward the protection of cultural resources such as can be found in California Penal Code, Title 14, Point 1, Section 622-1/2.

C.3.4 PROPOSED PROJECT

C.3.4.1 SETTING AND EXISTING CONDITIONS

Information provided regarding the setting of the proposed project places it in its geographical and geological context and specifies the technical description of the project. Additionally, the prehistoric, ethnographic, and historical background provides the context for the evaluation of the historical significance of any identified cultural resources within staff's area of analysis for this project.

Regional Setting

With minimal updates and editorial contributions, the following subsections entitled "Regional Setting," "Flora and Fauna," "Climate," and "Hydrology" were adapted from URS (2008: Section 2.1) and emphasize the non-archaeological aspects of these themes.

The project area is within the western portion of the Salton Trough, a topographic and structural depression within the Colorado Desert physiographic province. Technically, the Colorado Desert is a biotic designation, a subregion of the Sonoran Desert. It is bounded by the Coachella Valley to the north, the Gulf of California to the south, and mountain ranges to the east and west. The Salton Trough is filled with marine and poorly clastic fluvial sediments up to 15,000 feet thick (Dibblee 1954) and overlaying the basement rock. The Salton Trough has filled with eroded sediments from the surrounding mountains and with Colorado River deposits. During the Pleistocene glacial age, the Salton Trough was occasionally inundated by floodwaters of the Colorado River as it meandered across the desert toward the Gulf of California. This would occur as the river would alter its channel, causing it to disperse the water across the local topography.

The large lakes that were created as a result were random and intermittent in nature. There is evidence that there were several separate lake episodes during this period (Singer 2008).

During the Early and Middle Holocene, the area was arid, with little to no evidence of lake episodes until the most recent natural lake episode occurred circa (ca.) AD 1200–1600, when the Colorado River again began emptying into the Salton Trough, and created a massive lake as much as 95 meters (m) deep called Lake Cahuilla (Waters 1983). The project area is near the western shoreline of the former Lake Cahuilla within the Yuha Desert. The lowest portion of the Salton Trough is currently occupied by the Salton Sea, a human-made inland lake with no natural outlet.

The ground surface in the project area slopes gradually to the northeast, ranging from about sea level (elevation 0 feet) near the southwestern corner to an elevation of 345 feet near the northeastern corner.

Climate

The project area, and lower elevations within the Colorado Desert in general, appear to have experienced climatic and vegetation regimes similar to today, for most of the Holocene (ca. 11,000 years ago; Schaefer 1994:60–63). The creosote-scrub habitat that typifies the project area was established at lower elevations by the Late Pleistocene, indicating that people inhabiting the area would have had access to similar natural resources throughout much of prehistory. Numerous studies throughout the region, particularly the Mojave, have demonstrated relatively significant climatic, precipitation, and vegetation fluctuations throughout the Holocene (Kaijnkoski 2008). However, these studies have generally been in much higher elevations than the Yuha Desert. Those that have focused on lower areas have shown much less environmental change, likely due to the preponderance of precipitation in these low-lying areas within the rain shadow of large mountain ranges (Weide 1976). The major fluctuation in available resources within the project area through time then, and the concomitant placement of various site types on the landscape, is directly related to the episodic filling and desiccation of Lake Cahuilla (discussed below).

The climate of the project area can be characterized as hot and dry. According to climate data gathered at El Centro, California, between 1948 and 2007, the area experiences average annual maximum temperatures of 88.6 degrees Fahrenheit (°F) and average annual minimum temperatures of 56.6°F (WRCC 2008). The highest average maximum monthly temperature occurs in July (107.6°F), and the lowest minimum average monthly temperature occurs in December (39.9°F). Precipitation has been recorded in all months except June and averages 2.58 inches per year. Most of the precipitation falls from August to March (2.41 inches) in the form of rain. Snowfall has never been recorded during the reporting period.

Hydrology

The project area is crossed by a series of intermittent alluvial washes that begin in the project area or just south in the dissected hills along the boundary of the Yuha Basin. Extensive gullies and channels are present across the project area and throughout the greater Yuha Basin area. Surface water flows across the project area are likely to occur during seasonal periods of intense rainfall. None of the drainages passing through the project area is formally named. The numerous small arroyos, ephemeral drainages, and seasonal washes within the project area all drain into 5 larger intermittent drainages. The smaller tributary drainages descend from the higher, flat ridge tops channeling rainfall off the ridges into the larger main drainages. Higher areas of the drainages are often cobble- or bedrock-bottomed. The larger drainages are deeply incised, dissecting the ridges in the western and southern portions of the project area, and exhibit sand and other alluvial sedimentation along their bottoms.

Drainages in the western portion of the project area feed two larger drainages; both flow toward Coyote Wash, located north of the project area. The drainages do not directly connect to Coyote Wash. Instead, water flow from these identified channels spreads quickly into dispersed fans as it encounters the more sandy deposits found in the northern portions of the project area and along the broad floodplain of Coyote Wash.

The eastern half of the project area is drained by 3 deeply incised, intermittent, main drainages that flow generally north and east. These main drainages converge approximately 3 miles east of Plaster City. Topographic maps show this combined drainage ending less than a mile east of this convergence. The natural path of this drainage has been altered and stopped by the agricultural development of the area and the construction of the Foxglove Canal.

Analysis of aerial photographs east of the project area show evidence of the original water channels continuing east and eventually north toward the New River. However, the path of these drainages has been diverted and blocked by numerous canal systems including the Foxglove, Westside Main, Dixie, Fern, and Fig Canals. Historically, these drainages would have flowed directly into larger tributaries, including Coyote Wash, all feeding into the New River. The New River travels through the center of the Imperial Valley and drains into the Salton Sea, approximately 35 miles north of the project area.

The northern and western portions of the project area are dominated by alluvial and aeolian sand deposits. These sandy deposits correspond with the paleo-shoreline of the prehistoric Lake Cahuilla. The Salton Sea is the modern remnant of this once large freshwater lake, which inundated much the southern Imperial Valley through the Pleistocene and into the middle Holocene epochs (Schaefer and Laylander 2007). The modern hydrology of the project area, e.g., deeply incised drainages, extensive arroyo cutting, and dispersed alluvial fans, is evidence of the drastically decreasing lake level during the recession of Lake Cahuilla.

Flora and Fauna

Vegetation in the project area consists of a single vegetation community: Sonoran creosote bush scrub dominated by creosote bush (*Larrea tridentata*). Other vegetation observed include screwbean mesquite (*Prosopis pubescens*), desert sunflower (*Geraea canescens*), sand verbena (*Abronia ameliae*), burroweed (*Ambrosia dumosa*), desert needlegrass (*Achnatherum speciosum*), scale bud (*Anisocoma acaulis*), prickly poppy (*Argemone munita*), Borrego milk vetch (*Astragalus lentiginosus* var. *borreganus*), desert holly (*Atriplex hymenelytra*), yellow cups (*Camissonia brevipes*), white mallow (*Eremalche exilis*), pygmy poppy (*Eschscholzia minutiflora*), ocotillo (*Fouquieria splendens* ssp. *splendens*), annual psathyrotes (*Psathyrotes annua*), desert hollyhock

(*Sphaeralcea ambigua*), Emory's desert mallow (*Sphaeralcea emoryi* var. *emoryi*), tamarisk (*Tamarix chinensis*), desert lily (*Hesperocallis undulata*), Indian ricegrass (*Achnatherum hymenoides*), and smoketree (*Psorothamnus spinosus*).

Disturbed areas are mostly limited to dirt roads and off-road vehicle trails that traverse the project area. The project area also supports a diversity of common desert wildlife. The project area also has the potential to have several special-status species present, including plants such as brown turbans (*Malperia tenuis*), Harwood's milk-vetch (*Astragalus insularis* var. *harwoodii*), and flat-seeded spurge (*Chamaesyce platysperma*) and wildlife such as flat-tailed horned lizard (*Phrynosoma mcalli*), burrowing owl (*Athene cunicularia*), Le Conte's thrasher (*Toxostoma lecontei*), and American badger (*Taxidea taxus*).

Project, Site, and Vicinity Description

As noted above, the project area is within the western portion of the Salton Trough, a topographic and structural depression within the Colorado Desert physiographic province. Technically, the Colorado Desert is a biotic designation, a sub-region of the Sonoran Desert. It is bounded by the Coachella Valley to the north, the Gulf of California to the south, and mountain ranges to the east and west.

The project area and the project area of analysis are contributors to the Ancient Lake Cahuilla Interaction Sphere (ALCIS). The ALCIS reaches from the central feature of the ancient lake to the Pacific coast on the west, the San Jacinto Valley to the north, the Colorado River to the east, and into an as yet undefined terminus in Mexico to the south. While the primary emphasis is on the interaction sphere as an archaeological concept and focuses on cultural features of the landscape, the ALCIS also incorporates the natural history of the landscape and historical dimensions of the interaction sphere. With the lake as a focal point, the spatial proximity of the different elements of a highly diverse topography form numerous life zones and climates. The project area lands are currently administered by the Bureau of Land Management (BLM) on behalf of the public and are used for off-road vehicle and other outdoor activities.

Project Description

The components of the project description below reflect the project description in the original AFC (SES 2008a) and all subsequent modifications thereto (SES 2009q and SES 2010g).

Project Construction

Project Construction Schedule

The IVS Project would be developed in two phases. The schedule would be approximately 58 months in duration. Construction would require approximately 40 months.

Site Mobilization

Project facilities and amenities would be established during the first month of the build-out. The majority of these facilities would be located in the 11-acre construction laydown area adjacent to the Main Services Complex, which would be located within the project site approximately 1.5 miles south of the construction exit gate at Evan Hewes Highway. Project amenities would consist of site offices, restroom facilities, meal rooms, limited parking areas, vehicle marshalling areas/traffic staging, and construction material/ equipment storage areas. Construction power to the project site facilities would be provided by mobile diesel-driven generator sets and/or temporary service(s) from IID. Additional construction employee parking would be provided on the 100-acre laydown and staging area east of Dunaway Road. Employees would be moved to and from the project site from surrounding areas and/or the Dunaway Road parking area in up to 10 buses and other mass conveyance vehicles.

Project Site Preparation

The ground surface at the IVS Project site slopes northeast. The western portion of the site west of the SDG&E transmission line is characterized by rolling terrain with well-defined washes. East of the SDG&E transmission line, the site terrain has uniform and gentle slopes.

Site preparation would be based on avoiding major washes and minimizing surface-disturbing activities. Also, areas of sensitive habitat and cultural resources would be avoided wherever possible.

Brush trimming would be conducted between alternating rows of SunCatchers^{TM}. Brush trimming consists of cutting the top of the existing brush while leaving the existing native plant root system in place to minimize soil erosion. After brush has been trimmed, blading for roadways and foundations will be conducted between alternating rows of SunCatchers^{TM} to provide access to individual SunCatchers^{TM}. Blading would consist of removing terrain undulations and would be limited to 3 feet in cut and 3 feet in fill. The blading operations would keep native soils within 100 feet of the pre-development location, with no hauling of soils across the site. Paved roadways would be constructed as close to the existing topography as possible, with limited cut-and-fill operations to maintain roadway design slope to within a maximum of 10 %. Minor grading would also be required for building foundations and pads and parking areas in the Main Services Complex and substation areas.

The clearing, blading, and grading operations would be undertaken using standard contractor heavy equipment. This equipment would consist of, but not be limited to, motorgraders, bulldozers, elevating scrapers, hydraulic excavators, tired loaders, compacting rollers, and dump trucks.

Foundations

From the preliminary geotechnical investigations, it is expected that lightly loaded equipment and structures, including some of the equipment foundations in the substation yard, small equipment such as the fire water pump and standby generator, the support structures for the water treatment plant and the hydrogen storage area, and the transmission line lattice steel towers would be supported on shallow footings. Shallow footings would be continuous strip and isolated spread footings.

The majority of each SunCatcher^{TM} would be supported by a single metal fin-pipe foundation that is hydraulically driven into the ground. These foundations are expected to be approximately 20 feet long and 24 inches in diameter, with 12-inch-wide fins extending from each side of the pipe pile. Shallow drilled pier concrete foundations of approximately 36 inches in diameter and an embedment depth with a minimum socketed depth into rock of 6 feet would be used for hard and rock-like ground conditions.

The buildings and major structures such as yard tanks would be supported on shallow spread and continuous footings or mat-type foundations.

Deep foundations would be required for heavy items, such as the power transformers at the electrical substation.

Materials and Equipment Staging Area

Two construction staging and laydown areas would be used for the project. A 100-acre construction laydown area that includes a 25-acre construction staging area would be provided east of Dunaway Road. An 11-acre construction laydown area would be provided adjacent to the Main Services Complex.

Both the 25-acre construction staging area to the east of Dunaway Road and the 11-acre construction laydown area adjacent to the Main Services Complex would contain temporary construction facilities, including site offices, restrooms, meal rooms, conference rooms, storage facilities, and parking and vehicle maintenance and storage areas.

The 11-acre construction laydown area adjacent to the Main Services Complex would also contain a temporary fueling station. An 8-foot-diameter by 13⅓-foot-long diesel fuel storage tank with secondary containment would be temporarily located on a paved surface in this laydown area.

The 100-acre laydown area east of Dunaway Road is nearly level and thus requires little grading. The 11-acre laydown area adjacent to the Main Services Complex is on a gently sloping, rocky area that would require minimum grading and fill operations to create a level area. Pads would be prepared for setting the trailers housing the temporary construction facilities.

Project Laterals

The June 2009 supplement to the AFC (SES 2009q) proposes to replace the original concept of a waterline for raw canal water from the Imperial Irrigation District's Westside Main Canal with an approximately 12-mile long water line from the Seeley Wastewater Treatment Facility to the project site to convey tertiary effluent suitable for unrestricted recycled uses. The June 2009 proposal envisions the construction of the 12-mile long line principally along the right-of-way for the Evan Hewes Highway with the line ultimately being buried approximately 30 inches below the present grade.

The May 2010 supplement to the AFC (SES 2010g) largely retains the June 2009 waterline proposal. The May 2010 supplement revises the June 2009 proposal to accommodate the realignment of two segments, one 300-foot long and the other 160-feet long, to more closely follow the right-of-way for the Evan Hewes Highway.

Operation Impacts

It is expected that the IVS Project would be operated with a staff of approximately 164 full-time employees. The project would operate 7 days per week, generating electricity during normal daylight hours when the solar energy is available. Maintenance activities would occur 7 days a week, 24 hours a day to ensure SunCatcher™ availability when solar energy is available.

Project Operations

Operation of the Project would generate wastes resulting from processes, routine maintenance, and office activities typical of solar electric generation operations. Non-hazardous wastes generated during operation of the project would be recycled to the greatest extent practical and the remainder of the wastes would be removed on a regular basis by a certified waste-handling contractor.

Inert solid wastes generated at the project site during operation would be predominantly office wastes and routine maintenance wastes, such as scrap metal, wood and plastic from surplus and deactivated equipment and parts. Scrap materials such as paper, packing materials, glass, metals, and plastics would be segregated and managed for recycling. Non-recyclable inert wastes would be stored in covered trash bins in accordance with local ordinances and picked up by an authorized local trash hauler on a regular basis for transport to and disposal in a suitable landfill.

Project operations would consist of few inputs, most of which would be associated with the day-to-day operations and maintenance of the facilities, and the resulting energy production would decrease the area's reliance on imported non-renewable electricity. The existing transmission lines which run through the project site are convenient to this project, and adhere to the goals and policies of the Geothermal/Alternative Energy and Transmission Element. There are no recently proposed zone changes that affect this Project Site, and no changes to the general provisions for development of solar energy are in the Ocotillo/Nomirage planning area.

Operations and maintenance would not disturb the recreational use of surrounding land (e.g., OHV use at the Plaster City Open Area) and open space conservation. There would, however, be a loss of recreational use at the project site which is moderately used for dispersed camping and associated OHV use. Developed camping areas located in the Yuha Basin ACEC would not be disturbed. Nearby residences are well screened and Project operations would not divide any established communities, nor would the plan conflict with any applicable habitat conservation plan or natural community conservation plan

Liquid Wastes

Non-hazardous liquid wastes produced by the project would consist of wastes from the wastewater system.

The layout of the IVS Project site would be based on avoiding major washes and minimizing surface-disturbing activities. The site layout would maintain local pre-development drainage patterns where feasible and discharge from the site would remain at the northeastern boundary. The paved roadways would have a low-flow unpaved swale or roadway dip, as needed, to convey nuisance runoff to existing drainage channels or swales and use low-flow culverts. It is expected that storm water runoff would flow over the crown of the paved roadways, which are typically less than 6 inches from swale flow line to crown at centerline of roadway, thus maintaining existing local drainage patterns during storms. Unpaved roads would utilize low-flow culverts.

Localized channel grading would take place on a limited basis to improve channel hydraulics, and to control flow direction where buildings and roadways are proposed. Also, a channel would be constructed along the northeastern portion of the site. The Main Services Complex would be protected from a 100-year flooding by berms or channels that would direct the flow around the perimeter of the building site, if required.

A proposed channel, located within portions of Sections 9, 10 and 11 of Township 16 South, Range 11 East, would be constructed adjacent to the railroad and would discharge to the existing Dunaway Road dip section. This action would maintain existing pre-development flow patterns. Spoils from the channel would be placed along the southern floodplain, thereby minimizing flooding impacts to the SunCatchers™ placed along the southern bank. The proposed channel would improve acceptance of off-site waters at the railroad trestle.

Arizona Crossings (roadway dips) or low-flow culverts consisting of a small-diameter storm drain with a perforated stem pipe would be placed in the roadways, as needed, to cross the minor or major channels or swales. These measures are based on BMPs for erosion and sediment control.

The proposed East-West on-site paved arterial roadway section between the Main Services Complex and the 100-acre laydown area at Dunaway Road would be designed as a designated evacuation route. As such, culverts would be designed such that the roadway section shall have its driving surface constructed above the projected profile of a 100-year flood event.

The post-development flow rates released from the project site are expected to be less than the pre-development flow rates, thus complying with the BMPs.

All runoff crossing the site would flow north and east and would eventually reach the railroad tracks or Dunaway Road. Flow that reaches Dunaway Road would follow existing drainage north toward the railroad tracks. Flows reaching the railroad tracks would flow through the existing trestles or would follow existing drainage east. Flow would follow the railroad embankment and would then flow through the nearest trestle. Flow in excess of the capacity of the trestle would pond until it can flow through. As is the case with the interstate highway, sediment is deposited near the upstream side of the railroad embankment and under each of the trestles. Additional flows affect the northeast side of the project site, flowing south through the railroad embankment. The majority of the flow along the east side of the project crosses Dunaway Road just south of the railroad tracks. Ponding and sediment deposition in this area may be expected to create localized flooding during rainfall events.

A local, site-specific, small wastewater treatment plant at the Main Services Complex is proposed to process sanitary wastewater. A facility of this type would require permitting by the local Regional Water Quality Control Board (RWQCB), and would be designed to meet the operation and maintenance guidelines required by the State of California Department of Health Services.

Wastewater at the Main Services Complex would be discharged into a septic system with sanitary leach field, and would be designed to meet guidelines required by the RWQCB and the Department of Health Services.

Project Closure and Decommissioning

Project Closure

Project closure can be temporary or permanent. Temporary closure is defined as a shutdown for a period exceeding the time required for normal maintenance, including closure for overhaul or replacement of the major components, such as major transformers, switchgear, etc. Causes for temporary closure include inclement weather and/or natural hazards (e.g., winds in excess of 35 mph, or cloudy conditions limiting solar insolation values to below the minimum solar insolation required for positive power generation, etc.), or damage to the Project from earthquake, fire, storm, or other natural acts. Permanent closure is defined as a cessation in operations with no intent to restart operations owing to project age, damage to the project that is beyond repair, adverse economic conditions, or other significant reasons.

Temporary Closure

In the unforeseen event that the project is temporarily closed, a contingency plan for the temporary cessation of operations would be implemented. The contingency plan would be followed to ensure conformance with applicable LORS and to protect public health, safety, and the environment. The plan, depending on the expected duration of the shutdown, may include the draining of chemicals from storage tanks and other equipment and the safe shutdown of equipment. Wastes would be disposed of according to applicable LORS.

Permanent Closure

The planned life of the IVS Project is 40 years; however, if the project is still economically viable, it could be operated longer. It is also possible that the project could become economically noncompetitive before 40 years have passed, forcing early decommissioning. Whenever the project is permanently closed, the closure procedure would follow a plan that would be developed as described below.

The removal of the project from service, or decommissioning, may range from “mothballing” to the removal of equipment and appurtenant facilities, depending on conditions at the time. Because the conditions that would affect the decommissioning decision are largely unknown at this time, these conditions would be presented to the Energy Commission, the BLM, and other applicable agencies.

To ensure that public health, safety, and the environment are protected during decommissioning, a decommissioning plan would be submitted to the Energy Commission for approval before decommissioning. The plan would discuss the following:

- Proposed decommissioning activities for the project and appurtenant facilities constructed as part of the project,
- Conformance of the proposed decommissioning activities with applicable LORS and local/regional plans,
- Activities necessary to restore the project site if the plan requires removal of equipment and appurtenant facilities,
- Decommissioning alternatives other than complete restoration to the original condition, and
- Associated costs of the proposed decommissioning and the source of funds to pay for the decommissioning.

In general, the decommissioning plan for the project would attempt to maximize the recycling of project components. IVS would attempt to sell unused chemicals back to the suppliers or other purchasers or users. Equipment containing chemicals would be drained and shut down to ensure public health and safety and to protect the environment. Nonhazardous wastes would be collected and disposed of in appropriate landfills or waste collection facilities. Hazardous wastes would be disposed of according to applicable LORS. The site would be secured 24 hours per day during the decommissioning activities, and IVS would provide periodic update reports to the Energy Commission, the BLM, and other appropriate parties.

Premature closure or unexpected cessation of project operations would be outlined in the Project Closure Plan. The plan would outline steps to secure hazardous and non-hazardous materials and wastes. Such steps would be consistent with Best Management Practices, the HMBP, the RMP, and according to applicable LORS. The plan would include monitoring of vessels and receptacles of hazardous material and wastes, safe cessation of processes using hazardous materials or hazardous wastes, and inspection of secondary containment structures.

Planned permanent closure impacts would be incorporated into the Project Closure Plan and evaluated at the end of the project’s economic operation. The Project Closure Plan would document non-hazardous and hazardous waste management practices including the inventory, management, and disposal of hazardous materials and wastes and the permanent closure of permitted hazardous materials and waste storage units.

Environmental Setting

A Cultural and Natural Interaction Sphere Model for Ancient Lake Cahuilla and the Project Area of Analysis

The concept of the “interaction sphere” was introduced by J. Caldwell (1964) in an analysis and interpretation of sites and artifacts of the Hopewell culture in the Midwestern United States. While the original definition of the interaction sphere was focused on cultural characteristics of a particular region, here the concept is expanded to include natural aspects of the prehistoric and historic landscape; for example, the interaction between altitude and temperature, soils and vegetation, habitat and animal species, the filling and emptying of Lake Cahuilla and the cyclical presence and absence of fish and migratory water-fowl, and many other interrelated aspects of the Holocene environment. The following sections establish the integration of cultural and natural interaction spheres in more detail.

The present Salton Sea is at the center of Ancient Lake Cahuilla, and as the introduction to the ESRI-Redlands Institute Atlas of the Salton Area states, "Every land has a story." The introduction proceeds to document that the history of the Salton Sea began millions of years ago at the convergence of three tectonic plates: the Pacific Plate, the Farallon Plate, and North American Plate. The intersection of these plates has created one of the most topographically diverse regions on the surface of the earth, a region that has provided, and continues to provide an unusually wide range of climates, animals, and plants. Thousands of years after the establishment of the current natural environment, the cultural dimensions of the ALCIS developed within this land of complex topography and diversity of subsistence and technological resources. While in the midst of an extremely arid desert environment, the setting of the ALCIS provided a wide range of materials for settlement, subsistence, and technology.

Lake Cahuilla and the Salton Sea

With only minor editorial changes and updating, the following text was adapted from the URS text prepared in response to Data Request 112 from the Energy Commission:

An early survey and compilation of site locations within the Salton Sea basin found that sites were differentially distributed along the Lake Cahuilla shoreline, due to local geomorphology and a diverse range of shoreline types (Gallegos 1980). The study indicated that sites tend to concentrate near small bays and sandy pits where marsh habitats were more likely to develop, as well as steeper rocky shorelines, where proximal alluvial cones met the shoreline and fish traps could be more easily constructed. Additionally, a few archaeological sites have been identified on recessional beach deposits that postdate the final lake high stand. One of these is the Dunaway Road site, located very near the project area (Schaefer 1986). The site is situated on a raised, remnant beach berm at sea level (i.e., approximately 12 m below the maximal shoreline). No raised remnant shoreline deposits were identified in the project area below approximately 7.5 m (25 feet) elevation.

Schaefer (1994:72) has stated that "recessional beachlines in many areas have been destroyed by natural erosion or agricultural development" and this appears to be the case within the project area. As such, it is not anticipated that significant buried archaeological deposits associated with recessional shorelines are preserved within the western lake basin portion of the project.

Although remnant recessional shoreline features may not be preserved, Waters' (1983) dating of archaeological hearth features in stratified lake and alluvial sediments north of the project area, at or below sea level, indicates that there is a possibility of subsurface archaeological preservation within the lower-lying lake basin portion of the project area. However, the same processes that affect and destroy recessional beach formations have also likely disturbed archaeological sites deposited within the lake basin. Significant effort and thought has been put into this archaeological question over the last century. A recent summary of various findings and hypotheses related to the impact of Lake Cahuilla's fluctuations on prehistoric peoples and archaeology is presented by Laylander (2006).

Unfortunately, the majority of these studies is purely theoretical, limited by the time depth of documented 12 m lake highstands (approximately 1,000 years) and other evidence of prehistoric lake desiccation buried deeply within the lake basin (Waters 1983). However, very recent isotopic studies have begun to greatly expand our understanding of the nature and extent of Lake Cahuilla during the Late Quaternary.

A study by Li et al. (2008a) of carbonate tufas from 24 m below mean sea level (BMSL) in the Salton Sea basin provides intriguing evidence that a lake existed more or less continuously in the basin between 20,500 and 1,300 years ago. No hiatuses in tufa formation were observed over this period, and given that under current climatic conditions it would take only 30 years for a completely filled Lake Cahuilla to desiccate to 24 m BMSL (Wilke 1978), it suggests that at least a portion of the Colorado River flowed into the Salton Sea basin during that entire time span. While there is evidence for brief shifts of the Colorado River away from the basin between 8000–7000, and at 3050, 2180, and 1660 cal BP, this investigation failed to identify any complete desiccation episodes during almost the entire span of human history in the Salton Sea basin (Li et al. 2008b).

In light of this new evidence, an important research agenda for future geoarchaeological analysis of the region would be to identify the locations of prehistoric lake shorelines and the potential for preservation of associated archaeological sites. However, in relation to our current project area, some basic inferences may be made about prehistoric lake levels.

Regionally, prehistoric surface site density and complexity is notably higher within the region adjacent to the Lake Cahuilla shoreline (URS 2008). Given the resource potential of Lake Cahuilla in the otherwise sparse Yuha Desert, this pattern is not unexpected. A similar pattern should also be seen at all periods and locations of Lake Cahuilla shorelines since the Late Pleistocene. However, in order to more accurately assess the potential for prehistoric shoreline sites within the project area, one must know when and at what height Lake Cahuilla existed throughout prehistory.

As with other major delta systems in California (e.g., the San Joaquin and Sacramento River deltas in the San Francisco Bay Area), delta formation is largely dictated by sea level (Shlemon and Begg 1975). During the last glacial maximum 15,000 years ago, global sea level was over 90 m lower than today. As the ice sheets began to melt, sea levels began to rise substantially between 15,000 and 11,000 BP, at a rate of 13 m every 1,000 years. This rate decreased to about 8 m every 1,000 years between 11,000 and 8,000 BP, at which point sea level rise slowed considerably. Between 6,000 BP and the present, sea level has risen at an average rate of a little over 1 m every 1,000 years. As the base level rises, river systems deposit material at higher elevations, essentially retreating or prograding.

Prior to 6,000 BP maximum lake levels may have been controlled by other geological factors (e.g., bedrock). Deltaic levee control of maximum lake stands may not have played a major role until the Middle or Late Holocene when sea levels began to stabilize and approach modern levels. Lake high stand shorelines were likely much lower for the majority of the Late Pleistocene and Early Holocene and probably well outside of the current project area. This hypothesis is supported by the Li et al. (2008b) analysis of tufas collected from 8 m AMSL, which did not begin accretion until approximately 5,000 BP, suggesting that deltaic controls may have started to play a role at this time. Interestingly, this is precisely when the modern Sacramento-San Joaquin Delta began to form (Shlemon and Begg 1975). Based on this evidence, and an apparently much lower height of Lake Cahuilla prior to 5,000 BP, it can be expected that pre-Middle Archaic sites related to the Lake Cahuilla shoreline will be absent from the project area.

Nonetheless, several potential problems exist with the Li et al*.* (2008a, 2008b) reporting, including only cursory treatment of the reservoir effect on alteration of 14C dates derived from the tufa, and no discussion of evidence for depositional hiatuses (i.e., lake recession) which should be readily evident in the higher elevation (8 m AMSL) tufa. Nonetheless, their initial findings are significant and have dramatic implications for understanding the nature and extent of the Late Pleistocene and Holocene Lake Cahuilla.

Regional climatic trends through the Late Pleistocene and Holocene are important to the current study because of impacts at higher elevations and the production of material for alluvial fan deposition. Unlike many regions in the arid basin and range, we cannot use the record of Lake Cahuilla high and low stands as indicators of local environmental change. Lake fluctuations within the Salton Sea basin are primarily related to structural changes in the Lower Colorado delta, and the construction or breaching of a natural dike. These changes may or may not be environmentally dependent, and thus have little bearing on the timing of deposition-erosion cycles in the Yuha Desert. Instead, reliance must be on environmental fluctuation data from nearby regions, such as the Mojave, for the timing of these events (this completes the edited material from Data Request 112).

Paleoclimate

From the often snowy peak of Mt. San Gorgonio (11, 502 feet AMSL) to the below sea level depths of the Salton Sea basin (227 feet BMSL) less than 50 miles away, the physical extremes of the Salton Sea basin significantly influence the climate in the ALCIS. The mountain ranges surrounding the Salton Sea basin contribute to the creation of a variety of microclimates with the ALCIS, as they channel the winds from the Pacific Ocean and the Gulf of Baja California from the south and west, as well as the winds that enter the Coachella Valley from the north via Banning Pass.

The winds control the flow of moisture, and some of the areas of the Salton Sea basin receive less than 2 inches of rain per year, making them some of the driest locations in the Western Hemisphere. In the summer months, moist, warm tropical air moves from the Gulf of California and northern Mexico into the Colorado Desert with the Sonoran monsoon. From time to time, tropical cyclones develop over the northern Gulf of California, creating hurricane-strength winds and torrential rains. Although these force storms only reach the Salton Sea basin once every 5 to 10 years, they can drench the project area of analysis with 3 to 4 years' worth of average precipitation in just a few hours.

The Salton Sea basin is located at the intersection of the Mojave Desert to the north and the Sonoran Desert to the south and west. Both deserts are sparsely vegetated and both have experienced profound changes over the past 2 to 3 million years. During the Pleistocene geologic era, the world's climate oscillated between Ice Age conditions and warmer temperatures similar to the modern era; average temperatures were as much as 14.4°F cooler than today. Glaciers covered much of North America, and temperate forests extended far south of the present range. Warmer temperatures have been predominant for the past 10,000 years (the Holocene era), which encompassed all of the confirmed human occupation of the project area of analysis, and provided the initial natural and cultural setting that ultimately became the ALCIS.

The Sonoran Desert is a sub-tropical desert in the southern part of the ALCIS, and much of its moisture falls during the summer monsoon season (July to September). Rainfall varies from 4.7 to 11.8 inches each year, and average monthly temperatures range from 61° to 92°F. Nighttime and daytime temperatures vary during the summer with temperatures exceeding 100° F during the day and dropping to 65°F. During the winter, the variation from nighttime to daytime averages from 45°F to 70°F.

The Mojave Desert is less arid than the Sonoran Desert, but still receives very little rain. The Mojave is in the northern part of the ALCIS and has mountains of sufficient altitude that some of its annual moisture falls in the form of snow. Most locations in the Mojave receive less than 6 inches of rain per year, and in the heart of the desert the average falls from only 2 to 4 inches per year. Mojave Desert temperatures vary more than in the Sonoran Desert and winter temperatures often dip below freezing. Analysis of southeastern California packrat middens demonstrate that the Sonoran Desert was more humid 13,000 to 10,00 years ago (about the time of the beginning of human habitation) and average rainfall was almost 50 % higher than it is today. Joshua trees, which no longer grow in the Sonoran Desert, are now found farther north in the Mojave Desert; by contrast, the habitat of the desert tortoise is shrinking toward the south. Currently, Joshua trees do not grow any closer than 60 to 90 miles northwest of the Salton Sea, but are still on the northern periphery of the ALCIS. Vegetation species that are typical of the eastern Sonora (such as creosote bush, brittlebush, and catclaw acacia) replaced other species some 9,000 to 10,000 years ago (Redland Institute 2008: 12–13).

Geology

With minimal updates and editorial contributions, the following subsection was adapted from URS (2008: Section 2.1) and emphasize the archaeological aspects of the geology of the project area.

The basement of the Salton Trough is composed of Late Cenozoic and older crystalline igneous and metamorphic rocks. Extensive studies by the USGS in Imperial County indicate that the sub-basement, or lower crust, beneath the axis of the Salton Trough, is composed of a mafic intrusive complex similar to oceanic middle crust (Fuis and Kohler 1984). Metavolcanics, quartz, and jasper were the principal stone types utilized by prehistoric residents, and many sources of raw material were found on the surface of desert pavement. Appropriate stone for manos and metates was found in the washes and streambeds, or carried in from the nearby mountains. Obsidian was traded in from nearby sources, as part of the project area of analysis and ALCIS network, but was always a minor element in any lithic assemblages. Overall, the lithic artifact needs of the prehistoric inhabitants of the ALCIS were met by materials from locally available sources.

Geomorphology

With minimal updates and editorial contributions, the following sections entitled Regional Setting, Geology of the Project Area, Geomorphology of the Project Area, Dating Alluvial Desert Deposits in the Project Area, Methods and Results, Sediments and Soils in the Project Area, Flora and Fauna, Climate, and Hydrology were adapted from URS (2008: Section 2.1) and emphasize the non-archaeological aspects of these themes.

It has been widely demonstrated that a significant period of alluvial fan deposition occurred in the Salton Sea basin and range during the Pleistocene-Holocene transition (McDonald et al. 2003:198). Within the Soda Mountains of the Mojave Desert, alluvial fan deposition resumed around 6,000 years ago, corresponding with a resurgence of Lake Mojave (Harvey and Wells 2003). Two later episodes of fan deposition occurred around 3,000 years ago, likely associated with changes in the North American Monsoon and an increase in effective moisture at the onset of the Late Holocene, and again during the past 1,000 years, possibly due to climate changes associated with the Medieval Climatic Anomaly. These periods of punctuated fan deposition correspond with those observed elsewhere in the region, and are assumed to have affected the IVS Project area as well.

The IVS Project area represents a microcosm of the geomorphic conditions that exist in the Yuha Desert. Pliocene and Pleistocene non-marine sedimentary rock outcrops are located along the southern boundary of the project area. These formations mantle the uplifted Pliocene marine outcrops, which form the Yuha Buttes, just south of the project area. The non-marine rock outcrops within the project area are heavily dissected (eroded) and mantled by Quaternary fan piedmonts. More recent fan aprons issue from the leading edge of these piedmonts and reach to the paleo-shoreline of Lake Cahuilla, where various beach deposits are also located. As with most large alluvial fans, these Quaternary landforms are composed of numerous remnants and more recent deposits of varying ages. By examining the relationship between these landform components, relative age estimates can be developed, conclusions may be drawn as to the depositional history of that landform, and the potential of each landform to harbor buried paleosols of appropriate age can be determined.

Present Process Geomorphology

Note: With minimal updates and editorial contributions, the following subsection was adapted from URS (2008: Section 2.1).

The eastern half of the project area is drained by 3 deeply incised, intermittent, main drainages that flow generally north and east. These main drainages converge approximately 3 miles east of Plaster City. Topographic maps show this combined drainage ending less than a mile east of this convergence. The natural path of this drainage has been altered and stopped by the agricultural development of the area and the construction of the Foxglove Canal.

Analysis of aerial photographs east of the project area show evidence of the original water channels continuing east and eventually north toward the New River. However, the path of these drainages has been diverted and blocked by numerous canal systems including the Foxglove, Westside Main, Dixie, Fern, and Fig Canals. Historically, these drainages would have flowed directly into larger tributaries, including Coyote Wash, and all feed into the New River. The New River travels through the center of the Imperial Valley and drains into the Salton Sea, approximately 35 miles north of the project area.

In addition, berms that block natural drainages in the project area of analysis have been built to protect the Clean Harbor toxic waste disposal plant. The project area is also subject to short duration, intensive impact sheet wash during monsoon rains. Visual inspection of vertical profiles in numerous washes has not revealed any fault lines from the seismic activity in the Salton Sea basin.

Surface and Subsurface Hydrology

With minimal updates and editorial contributions, the following sections were adapted from URS (2008: Section 2.1).

Analysis of aerial photographs east of the project area show evidence of the original water channels continuing east and eventually north toward the New River. However, the path of these drainages has been diverted and blocked by numerous canal systems including the Foxglove, Westside Main, Dixie, Fern, and Fig Canals. Historically, these drainages would have flowed directly into larger tributaries, including Coyote Wash, and feed into the New River. The New River travels through the center of the Imperial Valley and drains into the Salton Sea, approximately 35 miles north of the project area.

Paleoecology

The project area of analysis is composed of multiple Life Zones whose animal and plant communities attracted and tempered the settlement and adaptations of a long sequence of prehistoric and historic populations. The Life Zones are (from the highest altitude to the lowest): Arctic/Alpine (10,000 feet and above), Canadian/Hudsonian (7,000 to 10,000 feet), Transition (5,000 to 7,000 feet), Upper Sonoran (3,300 to 5,000 feet), and Lower Sonoran (3,300 feet and below). Although some prehistoric and historic inhabitants of the ALCIS visited all of these Life Zones at one time or another, most settlement and subsistence activities were concentrated in the Transition, Upper Sonoran, and Lower Sonoran Zones, that is, between 5,000 feet and -227 feet in altitude (approximately a mile vertical distance).

The inhabitants of the project area of analysis lived primarily in the Lower Sonoran Life Zone, where fish, mesquite beans, and cactus fruit were available when the lake held water. During times when the lake was dry, settlement and subsistence were focused on the Upper Sonoran Life Zone. Edible varieties of agave cactus grow naturally on the rocky slopes of the Coachella Valley in the northern end of the ALCIS. Acorns and pinyon nuts were traded from Cahuilla bands of the mountains and passes of the Upper Sonoran Life Zone and Transition Life Zone, and mesquite beans were often received in return. Also, the *Diegueños* from the Pacific walked through and over the peninsular range to the desert to trade acorns for mesquite seeds and pods. There is no archaeological evidence that dried fish were traded beyond the immediate area (Redlands Institute 2008: 18-19).

Since Caldwell's initial application of the interaction sphere concept, it has been applied to a wide range of archaeological cultures. In a slight modification of Caldwell's original concept, Hayden and Schulting (1997:51) stated that "…the main factor responsible for the emergence of interaction spheres in transegalitarian societies is the development of an elite class. Elites who seek to maximize their power and wealth at the tribal level do so in part by establishing trading, marriage, ideological, military, and other ties to elites in other communities and regions. They use these ties to monopolize access to desirable regional prestige goods and to enhance their own socioeconomic positions."

Conforming with the expectations derived from this model, the data from Ancient Lake Cahuilla demonstrate that interaction sphere goods are predominantly subsistence prestige items (defined as foods that are not locally grown [seeds and beans] or produced [fish] and that had to be traded for) and that these subsistence goods were concentrated in the communities that had the greatest potential to produce surplus and to develop socioeconomic inequalities. While our traditional view of "elite" members of society tends to be more of chiefs sitting on thrones and those members of society with particularly well-developed artistic or religious abilities, elites can also obviously consist of those who control the subsistence network. These same features also seem to characterize well-known interaction spheres elsewhere in the world. In conceptualizing an elite for the subsistence-challenged ALCIS project area of analysis it is important to remember that the subsistence quest was paramount and that the leaders who built and controlled the fish traps would have to a certain extent controlled access to that resource, just as the owners of privately held groves of mesquite and oak would have controlled access to those resources; only the pinyon stands, somewhat more haphazard in their production, do not seem to have been controlled either by individuals or tribelets. Here we note that the pattern of distribution of natural subsistence resources on the landscape influenced human settlement patterns, subsistence practices, and patterns of trade and economic exchange.

The Ancient Lake Cahuilla culture area of desert North America fits the criteria of an interaction sphere, although as Hayden and Schulting noted (1997:51), understanding the general cultural dynamics responsible for the creation of interaction spheres has been poorly developed in archaeological and ethnological theory. In the case of Ancient Lake Cahuilla, the principal elements of the interaction sphere include fish traps, mesquite groves, pinyon groves, oak groves, agricultural products from the Colorado River, salt from the Gulf of California, the trail systems that connected the different resources areas, stone slab storage features, obsidian, traded ceramics, and marine shell. Ethnographically, it is well documented that the different bands of Cahuilla traded extensively across a multitude of life zones.

While the vast majority of archaeological sites in the project area of analysis have revealed neither non-local materials nor chronologically sensitive artifacts during previous and recent surveys, those that have, or have the potential to produce chronologically sensitive and non-local materials, may have participated in the interaction sphere in the past. Based on the ethnographic literature, the interaction sphere continued into at least the protohistoric period; and the ethnographic data also confirm that many of the materials that moved within the interaction sphere were perishable (such as animal and vegetal food stuffs, clothing, tools, and weapons), and this aspect of the cultural assemblage must be kept in mind when evaluating sites that although they have indications of having been semi-permanent settlements, are still devoid of non-local remains.

The project area and the project area of analysis are contributors to the ALCIS. While the primary emphasis is on the ALCIS as an archaeological concept and focuses on cultural features of the landscape, it also incorporates the natural history of the landscape and the historical dimensions of the interaction sphere. With the lake as a focal point, the spatial proximity of the different elements of a highly diverse topography and numerous life zones and climates that produced the mesquite beans, pinyon, nuts, acorns, fish, and riverine agricultural products integrates the cultural and natural interaction that existed. Although beyond the scope of this DEIS, a similar interaction sphere model might also be applicable to the Lake Elsinore region of Southern California.

Cultural Setting

Prehistoric Background

Contribution to the Ancient Lake Cahuilla Interaction Sphere

The IVS Project area ranges from inside the high water mark (approximately 40 feet AMSL) of Ancient Lake Cahuilla on the east to the sandy desert on the west. For millennia, the alternating episodes of the filling and emptying of the lake have interacted with human settlement in the region. For thousands of years, the ancestors of the modern Native American inhabitants of the Colorado Desert and the Colorado River were drawn to the lake and its rich resources as it filled, and then driven from it to the surrounding area when it again emptied and became barren. Lake Cahuilla was created when the lower Colorado River shifted its course within its delta and instead of flowing directly south to the head of the Gulf of California, the river's waters were diverted northwest into the Salton Basin, the base of which lay about 80 m BMSL. With climatic conditions similar to those of today, two decades of uninterrupted river flow would have been required to fill the basin to 12 m amsl (Wilke 1978; Waters 1983; Schaefer and Laylander 2007). When the river once again shifted its course to the south, the isolated basin would have taken more than 5 decades to completely dry out. The former presence of a large lake in the Salton Basin was remembered in the oral traditions of the region's historic-period native inhabitants, the Cahuilla and the Kumeyaay (Wilke 1978). Research has established that there were not one but several different high stands of the lake, both prior to AD 1000 and after AD 1500, including a stand as late as the 17th century, when Spanish explorers had already reached the lower Colorado River although not entering the Salton Basin (Wilke 1978; Waters 1983; Laylander 1997). One of the more exciting tales from the early historic period deals with the "Lost Pearl Ship," which supposedly sailed, unawares, into the Salton Basin during a high flood period, but was unable to leave when the river shifted course once again.

A recent overview of the general project area by Schaefer and Laylander (2007) and a Class III Intensive Field Survey for the IVS Project have both contributed to our knowledge of sectors of the Salton Sea/Ancient Lake Cahuilla region, in particular the lesser known southern and southwestern areas (Wilke 1978). As Schaefer and Laylander (2007:250–251) stated, the picture of settlement and subsistence patterns that is emerging for Ancient Lake Cahuilla is one of substantial variability. Settlement appears to have been the densest in the northwest part of the former lake in the area that is now the Coachella Valley. Relatively little is known of the southern part of the lake, both the “toe” that is across the border in Mexico and in the project area. Whereas V-shaped fish-traps and tabular sandstone oval/round storage structures have been observed and documented outside the project in landscape regions associated with Lake Cahuilla, none has been observed thus far within the IVS Project area of analysis.

The project area and the project area of analysis are contributors to the ALCIS. While the primary emphasis is on the interaction sphere as an archaeological concept and focuses on cultural features of the landscape, the ALCIS also incorporates the natural history of the landscape and historical dimensions of the interaction sphere. With the lake as a focal point, the spatial proximity of the different elements of a highly diverse topography form numerous life zones and climates. The project area lands are currently administered by the BLM on behalf of the public.

As physical components of the ALCIS, archaeological research in the IVS Project area has recorded the presence of ancient trails that extend almost from the eastern project boundary to the western boundary. Overall, these trails appear to connect local settlements with local resource areas and there is little evidence of interconnections with larger regional trail systems. However, Instrumental Neutron Activation Analysis (INAA) studies of southern California prehistoric ceramics obtained from sites along an east-west transect between the Colorado River and the Pacific Coast (Hildebrand et al. 2002:123) that passes through the southern part of the Lake Cahuilla basin and includes samples from the Dunaway Road Site, which is within the project area, shows the transport of Salton Brown ceramics from the Salton Trough to the mountains of the Peninsular Range.

The technical studies required by the BLM have resulted in the recording of more than 300 locations of prehistoric use and settlement. The locations that are still visible range from the sites of the short-term manufacture of stone tools to larger sites that were occupied for longer periods of time while seasonal natural resources were harvested. In general, the largest sites are those closest to the former lakeshore. Possible cremated human remains recorded in a number of locations are another indication of longer-term settlement in the project. Overall, the archaeological data from the project indicate that the prehistoric inhabitants were focused on exploiting local food resources and producing their tools from locally available materials. As stated before, the large V-shaped fish-traps for which the area is known do not occur in the project area, although a small portion of the ancient lakeshore is within the project area.

Introduction to Prehistory of the Colorado Desert

The project area is situated within the Colorado Desert in a region that had few archaeological investigations until the 1980s. As more extensive archaeological excavations are completed, a clearer picture of the cultural history of the Colorado Desert is beginning to emerge. As Schaefer and Laylander (2007) point out in a recent review of the prehistory of the Colorado Desert, the archaeology here is embedded in a larger context that includes the Mojave and Sonoran Deserts but that has its own distinct archaeological manifestations. Also, the course of prehistory in the area was influenced throughout the Holocene by the Colorado River as it periodically inundated the Salton Trough and created Lake Cahuilla (Weide 1976; Schaefer and Laylander 2007).

These events increased freshwater resources and created areas with a more fertile environment able to sustain larger populations. The most recent research indicates the existence of no fewer than 3 cycles of inundation and desiccation between AD 1200 and 1600 (Schaefer and Laylander 2007). The periods of inundation for Lake Cahuilla before this period are poorly known and, as noted above, innovative research by Li (2008a, 2008b) suggests that, in contrast to previous interpretations, the lake was never completely dry.

Malcolm Rogers conducted the most extensive archaeological survey and report of the Colorado Desert in the 1920s (Weide 1976). His theories on the periods for many of the sites he found are uncertain because most of the cultural material is non-stratified surface remains, and at that time the artifact chronology was in early stages of development (Rogers 1939). Several sites recorded have no artifact assemblage associated with them; they are merely cleared circles of about 6 feet in diameter and are sometimes defined by a low wall around the perimeter. Rogers interpreted these sites as “temporary bedding platforms.” These bedding platform features and other sites containing artifact assemblages of heavily patinated crude tools were the basis of Rogers’s suggestion that they were associated with a pre-projectile point culture (Pre-Paleoindian period). The absence of dateable material makes this hypothesis inconclusive.

Aside from the disputed Pre-Paleoindian period, archaeological research in southern California over the past century has resulted in the development of a temporal scheme for regional prehistory that is generally accepted by the archaeological community (Moratto 1984). The temporal periods include the Paleoindian period, 12,000 to 7,000 BP; the Archaic period, beginning between 8,000 and 7,000 years before present (YBP); and (transitioning to) the Late Prehistoric period at approximately 3,000 BP. Most local chronologies invoke an Intermediate Period between the Archaic and Late Prehistoric. The literature referenced for this report has not clearly defined this Intermediate Period, other than it is a period between 500 BC to 500 AD (Justice 2002). A discussion of time and culture (Justice 2002) in the Southwestern United States presents the Intermediate Period as a time period which witnesses the emergence of agricultural communities in the Southwest, and at the time of Basketmaker. Although specific dates are given, the beginning and end dates for each period are not static because technological innovations occurred at different times within this region. For example, the introduction of the bow and arrow closely coincided with the introduction of pottery, but their introduction does not appear to have occurred simultaneously throughout the region (Moratto 1984).

Prehistoric site types common to the project area include (from most to least complex): open camps, with a variety of artifact classes (chipped stone, ground stone, and ceramics) and sometimes features; lithic scatters, with varying frequencies of cores, core tools, flakes, flake tools, and hammerstones; and trails, linear features with or without associated artifacts. To this basic site typology can be added isolated artifacts, which are most valuable in the aggregate. In the absence of chronometric age estimates and/or temporally diagnostic artifacts (e.g., projectile points and ceramics), assigning an age range to each of these loci of human activity is difficult and, oftentimes, impossible. The problem is exacerbated by the fact that many sites are probably palimpsests; that is, dense mixtures of occupational debris scattered over a large area, created through constant use or repeated seasonal use of a location. Thus, artifacts from late occupations may be conflated (through natural or cultural factors) with artifacts from earlier occupations, making it difficult to "tease apart" the multiple strands of human occupation and activity.

Paleoindian Period "San Dieguito" (12,000 to 7,000 YBP)

San Dieguito is the earliest established and dated period for the Colorado Desert region (Weide 1976). The start of the Paleoindian period is marked by increased rainfall and cooler temperatures that resulted in the formation of deep pluvial lakes and marshes even in interior desert regions and offered a multitude of subsistence options. Although temperatures warmed and the lakes began to recede around 11,000 YBP (Moratto 1984), the recession was so gradual that the pluvial lake environment was still in existence for several millennia.

These cultural patterns composed the Western Pluvial Lakes Tradition, which included developing methods of procuring foods and materials based on the plants and animals that lived around the lakes (Moratto 1984). Marshes in particular offered a variety of plants with edible seeds, roots, and stems. This habitat provided frogs, turtles, fish, and water rats and attracted ducks and other waterfowl, which were good for meat and eggs. Sites located adjacent to the west and south of the former shore of Lake Cahuilla reveal that these people had developed a flaked-stone industry with an extensive number of tool forms, including ovate bifaces, chipped stone crescents (called amulets by Rogers), drills, cleavers, pulping planes, and keeled scrapers (Rogers 1939). Milling tools are conspicuously absent from these sites, implying that hard seeds were not included in the diet (Moratto 1984).

Curiously, the evidence for human presence in the Colorado Desert in the Late Pleistocene and Early Holocene is scarce. This lack of evidence is in marked contrast to well documented occupations in the surrounding regions of the Mojave Desert and coastal southern California (Schaefer and Laylander 2007). Circumstance such as the ephemeral nature of settlement during the period, the instability of landforms, or sampling bias of research locations may explain this lack of evidence rather than an actual gap in occupation.

As noted above, locating Paleoindian period sites in the project area is particularly problematic because few large mammals were hunted in the Yuha desert or the Salton Basin and there are few opportunities to identify the by-products of the manufacture, discard, loss, or prehistoric curation of the archetypal projectile points that are characteristic of this period. Furthermore, it has oft been stated that heavily patinated artifacts found in desert environments are indicative of greater age, but patination is the product of a complex interaction of natural and cultural factors, the interpretations of which are often subjective and idiosyncratic. One can be confident, however, that heavily patinated artifacts are most likely older than less patinated and unpatinated artifacts, if one is so lucky to have such gradations of artifacts present in an assemblage. Thus, sites without diagnostic artifacts can only be categorized as of unknown age.

In an effort to define and delimit extensive scatters of undated lithic artifacts in the Yuha Desert, situated immediately south of the project area, the BLM El Centro Resource Area nominated in 1981 the Yuha Basin Discontiguous District (District) for listing in the NRHP (Welch 1983). They described the district as four separate, but archaeologically related areas that share common features and create a unified whole. Most of the sites are classified as surface lithic scatters on a stable desert pavement surface that define "concentrated Paleoindian cultural resources." (Welch 1983). The sites in each area are generally composed of large percussion flaked bifaces and bifacially flaked cobbles, and resultant debris (i.e., flakes), without pottery and sometimes with features, which are ascribed to the Paleoindian San Dieguito cultural tradition (Welch 1983). Many of the artifacts are heavily patinated, which some archaeologists believe reflects long exposure to weathering, but that interpretation is by no means universally accepted. Associated features include cairns, cleared circles, rock alignments, and trails. These sites are predominantly located on terrace remnants and residual ridges, overlooking drainages and the former basin of Lake Cahuilla. It has been interpreted that San Dieguito people followed a generalized hunting and gathering pattern of settlement and subsistence, with an emphasis upon hunting.

More direct, and seemingly more definitive, evidence of Paleoindian occupation was documented by the Yuha burial (4-IMP-115) located south of the project area. This burial consisted of a nearly complete skeleton encased within a large rock cairn (Chartkoff and Chartkoff 1984: 56). A radiocarbon age estimate of 21,500 ± 2,000 years BP and 22,000 ± 400 years BP were obtained on caliche that encrusted the human bone (von Werlhof and von Werlhof 1977). Most archaeologists judge this date to be unreliable, however. Moreover, the burial style is unlike any other known Paleoindian burials and similar to more recent styles (Chartkoff and Chartkoff 1984: 56).

Thus, unambiguous evidence of Paleoindian occupations in the project area has not yet been found. It will take more data, particularly from chronometrically dated contexts or in association with diagnostic artifacts, to resolve the uncertainty.

Archaic Period (7,000 to 3,000 YBP)

Evidence for Archaic Period sites is nearly as scanty as that for Paleoindian in the project area. Again, in the absence of chronometrically datable materials, temporally diagnostic artifacts distinguish the occupational period. Pinto series (stemmed indented) projectile points define the Early Archaic, while Elko (corner-notched and side-notched) and Gypsum (contracting stem) points represent the later Archaic Periods (Apple et al. 1997: 2–19). Groundstone artifacts are also common on Archaic sites in the area, especially on open camps, which are mostly located in the transitional zone between and within the Fan Apron landforms in the central portion of the project area and the Beach Zone.

Some sites in the project area contain *Olivella spp.* shell beads, but are probably related to more recent occupation of the project area. If Middle and Late Archaic sites are located in the project area, they are most likely buried and located within the Fan Apron landforms in the central portion of the project area and the Beach Zone.

With an increase in temperature and the evaporation of the pluvial lakes during the early Holocene, it is believed that the population of the Colorado Desert likely dropped. The number of archaeological sites that have been found to date from this period continues to be limited, and dating for these sites is questionable.

A few Pinto-like points have been found in the Colorado Desert, such as one at the Split Mountain Sand Dune site. Because the stratum where the point was recovered was radiocarbon-dated to 770 YBP, the point likely represents reuse by a later cultural group rather than the presence of Pinto cultural group. A substantial study from this period comes from the Indian Hill rock shelter (CA-SDI-2537). This study seems to indicate a fairly stable use of the site with cached resources used on seasonal visits (McDonald 1992). Similar slab-lined pits have been found in a rock shelter near Palm Springs (CA-RIV-45), which may suggest logistical foraging by mobile groups (Bean et al. 1995).

Pinto points have also been recorded at sites located along relict terraces of Ancient Lake Cahuilla. These sites indicate that the lake may have refilled temporarily during this period (Weide 1976) The presence of these sites, the Truckhaven Man burial (radiocarbon date of 5,840 YBP), and a quartz point of unspecified type from a stratum radiocarbon-dated at 4,980 YBP (Weide 1976) suggest that the Colorado Desert region was not entirely unoccupied during the early and middle portions of the Archaic Period; people may have been present only on a seasonal basis because of lack of resources (Fagan 2003). As the presence or absence of Lake Cahuilla is not well known from this period, the scarcity of sites may indicate that the Salton Trough was generally dry (Schaefer and Laylander 2007).

The evaporation of the Lake Cahuilla lakes also caused a shift in flora to plants adapted to arid climates. The hard seeds of mesquite (*Prosopis juliflora*) and screwbean (*Prosopis pubscens*) and foods from other desert-adapted plants, such as various types of cactus and agaves, became staples of the Native American diet (Barker 1976). Groundstone tools, including manos, metates, mortars, and pestles, were developed to aid in the processing of these new foods, and are commonly found in artifact assemblages throughout the Mojave and Colorado deserts (Moratto 1984). In addition to stone tools, people of the Colorado Desert may have made wooden milling utensils and other artifacts of organic materials that are usually not preserved in the archaeological record. Ethnographic records show use of wooden mortars and pestles, items such as hooked sticks for shaking mesquite pods down from trees, nets in which to collect cactus and then beat against the ground to remove the needles, digging sticks for excavating rodents from burrows or digging up plants, and throwing sticks for hunting hare and other small game (Barker 1976). These tool types likely persisted for millennia with little change in technology or style.

Recently, a number of late Archaic sites have been documented from the northern Coachella Valley (Love and Dahdul 2002). These sites show evidence of substantial occupation, with deeply buried midden deposits containing clay-lined features, cremations, hearths, and living surfaces. These sites contain milling equipment and the faunal assemblage is dominated by lagomorphs. These sites suggest a more sustained settlement type than previously known for the Archaic Period in the area and are likely related to highstands of Lake Cahuilla.

Late Prehistoric Period (3,000 YBP to European Contact–AD 1769)

Evidence from recent archaeological investigations at late prehistoric sites along the Lake Cahuilla shoreline indicate 3 cycles of inundation and evaporation over the next 400 years (Schaefer and Laylander 2007). Recent studies by Li et al. (2008a, 2008b), however, indicate that these periods of evaporation may have been only partial and that some water always remained in the basin. Prehistoric fish traps of linear cobble arrangements (Fagan 2003), and shallow excavated pits, measuring approximately 3 m wide by 1 m deep (Singer 2008), are visible in some locations arranged in linear fashion, and marking the retreating shoreline of Lake Cahuilla.

The insertion, expansion, and retreat of this large body of water in the midst of a very arid region had profound consequences for the prehistoric occupation of the region (Schaefer and Laylander 2007).

Recent research shows that around AD 1200, the Colorado River shifted course and refilled Lake Cahuilla (Schaefer and Laylander 2007). This refilled lake provided a stable year-round water supply in the Colorado Desert. People began to repopulate the Colorado Desert, some following the river on its route from the Colorado River Valley and some attracted from the Mojave Desert or the mountain ranges to the west (Moratto 1984; Weide 1976). Ceramic wares, which had been introduced centuries before in other areas, were brought into this region with the influx of people. Beginning around AD 870, Patayan I ceramic types such as Colorado Beige, Colorado Red, and Black Mesa Buff appear on the shoreline of Lake Cahuilla (Schaefer and Laylander 2007). The Lower Colorado Buff wares, in common use since AD 800, show new attributes around AD 1050, such as stucco finishes, recurved jar rims, and tab handles on scoops. These attributes aid archaeologists in dating sites that appear in the area (Moratto 1984).

Late period assemblages beginning circa AD 1250 are typified by the profusion of the Desert side-notched and Cottonwood arrow points, which replace the larger projectile point traditions of earlier eras (Jones et al. 2007). These smaller points indicate the introduction of the bow and arrow and the replacement of the atlatl (Moratto 1984). These projectile point types are common throughout California during this period and into the historic period (Justice 2002).

People began to occupy permanent settlements and exploit different food sources at different times of the year because enough resources were present to provide year-round sustenance. Evidence for these settlements can be seen in coprolite analyses, which reveal the remains of plant and animal foods available during different seasons (Moratto 1984). Trade networks between coastal peoples and the occupants of the desert interior began to develop around AD 1000. This development is apparent in the archaeological record by the exponential increase in shell beads within Colorado Desert sites (Fagan 2003).

Around AD 1400, the course of the Colorado River shifted eastward, and as Lake Cahuilla gradually dried up, native peoples were confined to a decreasing fertile area

(Moratto 1984). As the lake receded, surrounding areas experienced an increase in occupation as the population shifted to more abundant lands, such as the Colorado River Valley and mountains to the west of the Salton Trough (Weide 1976; Moratto 1984). People persevered in this desert environment, as evidenced in a series of stone-lined fish traps marking the progress of the receding waterline (Moratto 1984). As subsistence resources disappeared along with the lake, people also attempted to rely on limited agriculture. As the aridity increased, the local inhabitants expanded their utilization of the resource base to include several hundred plants for food manufacture and medicine (Fagan 2003). Evidence of water control techniques, such as the use of wells and springs for irrigation and the construction of reservoirs and ditches, is apparent (Weide 1976).

Materials used in projectile point production include chalcedony, chert, quartzite, quartz, fine-grained basalt, andesite, and obsidian. Isotropic materials such as obsidian were preferred sources for projectile points, and the receding shoreline of Lake Cahuilla exposed an ideal obsidian source, Obsidian Butte, which is located between 131 feet AMSL and 230 feet BMSL at the southern end of the Salton Sea. This lithic source was exposed intermittently during the Late Prehistoric period and subsequently exploited for use in flaked stone tool manufacture. Although a local source of obsidian was available, its application to tool manufacture was supplementary and accounts for no more than 10 % of debitage assemblages from montane and coastal southern California. Obsidian hydration dates for the source range from AD 1200 to 1800 (Laylander 1997).

Ethnographic Background

With minimal updates and editorial contributions, the following text was adapted from URS (2008: Section 2.1).

Across the local landscape, prehistoric settlement and subsistence patterns are evident in the archaeological record. Potential ethnographic resources have been identified north, northeast, and south of the proposed project area. The project area is surrounded to the west by Fish Creek and the Coyote Mountains, to the northeast by the Superstition Mountain Range, to the east by the Chocolate Mountains and Indian Pass, and to the south by Mount Signal. All these landforms are associated with archaeological deposits and were dominant geographic elements of the prehistoric landscape. Several significant geoglyphs related to Yuman origin stories have been recorded south of the project area. The project area has the potential for a unique archaeological signature and a signature related to the established archaeological district. Love and Dahdul (2002) describe archaeological deposits similar to the deposits in the project area in their article that focuses on sites identified south of Palm Springs and north of Coachella located on the northern extent of the high water mark of Lake Cahuilla.

Kroeber’s 1925 inventory of California Indian groups found that the Salton Trough was occupied at least intermittently by the Kamia (Heizer 1966), a band that has been more recently linked to the Ipai and Tipai tribes. The bands shared the Tipai language, classified in the Yuman language family, Hokan stock (Luomala 1978). Together, the Ipai and Tipai ranged from the Colorado Desert to the coast, and along the coast from Agua Hedionda past the Todos Santos Bay (Luomala 1978). The Tipai were thought to have lived along the coast and in the mountains for millennia before migrating east into the Mojave Desert and south along the Colorado River around AD 1000; eventually Tipai people moved farther into the Colorado Desert, including around Lake Cahuilla (Luomala 1978). As Lake Cahuilla receded, some Tipai migrated back to the mountains and others relocated to the banks of the New River and the Alamo River.

The Kamia band occupied a small area of the Ipai/Tipai area and was found primarily in Imperial Valley (Gifford 1931). Heintzelman recorded a population of 254 Kamia living along the banks of the New River in 1849 (Barker 1976). The Southern Diegueño (an older ethnographic designation for groups that today are variously called Ipai, Tipai and Kumeyaay) occupied the peninsular ranges to the west of the Colorado Desert, and the Kamia kept in close contact with this group, though they spoke different dialects and had different social structures and subsistence collection methods (Barker 1976). The Kamia would frequently exchange agricultural produce with their Southern Diegueño neighbors for gathered food staples abundant at higher elevations, such as acorns, dried cakes of mescal, and piñon nuts (Gifford 1931; Barker 1976). Interaction between the Kamia and the Southern Diegueño was so extensive that Gifford had difficulty defining a territorial boundary between the two (Gifford 1931).

As another manifestation of the continuity of the ALCIS into the historic period, the Kamia apparently also had strong relationships with another group of Yuman speakers, the Quechan tribe to the east, who occupied the Colorado River Valley (Luomala 1978). The two tribes were so familiar with each other that it was reported in 1849 that the "Grand Chief of the Cuchans" (Quechan) was a Kamia and born in a New River settlement (Gifford 1931). The two tribes shared many traits, including the practice of agriculture, and frequently were allied in battle (Gifford 1931). As with the Southern Diegueño, friendly relations made territorial boundaries between the Quechan and the Kamia difficult to ascertain, and Gifford even records Kamia living in Quechan territory, on the west bank of the Colorado River (Gifford 1931).

Some overlapping of territory may also have occurred with the Cahuilla, whose boundaries lay close to the north, extending from the Salton Trough up to the San Bernardino Mountains (Bean 1978). No record of interaction with the Kamia exists; the Cahuilla preferred to trade and intermarry among tribes more closely related to their own language and culture, such as the Gabrielino, found along the coast near present-day Los Angeles (Bean 1978). Their language belongs to the Cupan subgroup of the Takic family of Uto-Aztecan stock (Bean 1978). Because the environment of the Cahuilla was similar to that of the Kamia, subsistence tactics were essentially the same for both, though the Cahuilla relied less on agriculture (Bean 1978).

Although European contact with the Tipai occurred with the arrival of the Spanish in 1540 (Luomala 1978), the inland band of Kamia may not have encountered colonists until 1769. It was at this time that the Spanish took an interest in inland routes and Gaspar de Portolá, governor of the Spanish territory Las Californias, led an expedition through Mexico and across the Colorado Desert region to San Diego (Chartkoff and Chartkoff 1984). Still, even before this time, the impacts of the contact on the coast rippled through native settlements, resulting in population drops even among the interior tribes due the introduction of new European pathogens (Cook 1978).

The Kamia band of Tipai were a semi-sedentary people who, in contrast with the rest of the Tipai, practiced horticulture during summer months, after the floods of the Colorado River had peaked (Luomala 1978; Barker 1976). Crops such as maize (*Zea mays*), tepary beans (*Phaseolusacutifolius* var.*latifolius*), and several species of gourds and melons were grown, as were cowpeas (*Vigna sinensis*), which had been introduced by the Spanish (Barker 1976). Irrigation canals were typically not used in most areas, with the exception of the Jacumba Valley, but occasionally sloughs were dammed to thoroughly soak an area before planting (Gifford 1931). Agricultural practices were supplemented by gathering wild plant foods, with a particular reliance on mesquite and screwbean (Barker 1976). They also practiced hunting rabbits, deer, sheep, and small mammals, and fishing in sloughs around the New River (Barker 1976). The last Kamia chief died in 1905 and was not replaced because the population was too scattered (Barker 1976).

Diegueño ceramics were created with the paddle-and-anvil technique. The clay was ground and no temper was added. Included in the Diegueño ceramic assemblage are ollas, bowls, pots used for cooking, and pipes. Of notable interest are the large storage ollas, reaching 33 inches in height, which served as granaries and were "highly valued by their owners, who made every effort to preserve them and keep them serviceable" (Rogers 1973:18). Only a small %age of ceramics created by the Diegueño was painted or incised. Group interaction involving ceremonies, dances, and gambling games were also a large part of Diegueño life. In fact, Diegueño ties with the Kamia were so strong it was common for them to travel to Kamia territory during the winter months to enjoy the warmer temperatures and the produce farmed by the Kamia (Gifford 1931).

The Kamia created pottery using the paddle-and-anvil technique and, according to Rogers (1973), produced the greatest variety of ceramics among Yuman bands. Included in the assemblage were ollas, jars, canteens, bowls, rattles, plates, scoops, cups, and parchers, remnants of which are identifiable within the project area. They also created small figurines with "coffee bean" shaped eyes, which were also traded with other bands and miniature vessels that Gena Van Camp, author of "Kumeyaay Pottery," believes were potential funeral offerings (Van Camp 1979:57). Clay for ceramics was obtained from old lakebed deposits in the central region of the Colorado Desert. Some Kamia ceramics had a small amount of crushed rose quartz added to the temper, while others contained very fine inclusions. The surface color of the ceramics varies from pink, to buff, to an "oyster white" (Rogers 1973). After firing, designs were painted with red and/or black designs. The coloring was obtained from red ochre and boiled mesquite bark (Gifford 1931).

As noted above, new studies of the ceramics produced in the project area of analysis (Hildebrand et al. 2002) has brought a new perspective, solidly based on chemical analyses of the clays used to produce the ceramics and the ceramics themselves, to the protohistoric and historic production and distribution of the ceramics found at sites in the project area.

The Cahuilla oral traditions include numerous accounts of the existence of a lake in the Salton Sea basin. William P. Blake was the first European to document these traditions in the mid-19th century. The Cahuilla had limited contact with the Kamia. The linguistic and cultural differences between the tribes were enough to limit the communication between the tribes. Though these cultures existed adjacent to each other and the Ancient Lakeshore, it is possible that variations in settlement and subsistence practices can be identified. Modern research conducted along the receding Lake Cahuilla shoreline has exposed extensive cultural deposits associated with a lacustrine environment (Apple 1997).

The Quechan lived in a series of settlements called *Rancherias,* which were scattered along the banks of the Colorado River. These settlements were moved seasonally, as the Colorado River would typically flood during the spring and then recede during the winter. The Quechan were primarily agriculturists, growing crops of maize, squash, and beans. After the European invasion, they also grew a variety of melons, wheat, and black-eyed peas. They supplemented their diet by gathering wild plants such as mesquite and screw bean pods, and it is important to remember that mesquite groves were privately owned. Fish from both the Colorado and Gila Rivers was also a staple of the Quechan diet, but hunting was relatively unsuccessful due to the harsh desert climate (Bee 1983:10). The Quechan used a variety of nets and fish traps, along with cactus spine hooks and the bow and arrow, to fish during the spring and fall months when the fish were most plentiful (McGuire 1982).

The lower Colorado River tribes were organized militarily and warfare played a significant role in Quechan life. The Cocopah and the Maricopa were enemies of the Quechan. The Quechan would join their Mohave neighbors to the north and strike out against their collective enemies (Bee 1983:93). The Quechan most likely acted as “middlemen” who extracted a portion of trade goods in exchange for safe passage through pre-contact trade routes at the Colorado River crossing. After European contact, this role may have increased conflict with the Spanish and other tribes, as trade with the Spanish became an economic factor.

The Quechan created pottery using the paddle-and-anvil technique and “had a long pottery tradition inherited from the Patayan” (Moratto 1984). “They made large storage vessels capable of floating food and goods across the Colorado River” (Hayes and Blom 2006:138). Other types of ceramics made by the Quechan included bowls, parchers, cooking pots, small figurines, and a “rare floating bowl” that was used by women to hold perishables and infants, which could be pushed ahead as they swam through the river (Campbell 1999). These ceramics were also included in the study by Hildebrand et al. (2002) and demonstrated transport of Colorado River ceramics as far west as the Peninsular Range, almost certainly passing through the project area, around the southern shore of the lake.

The Cocopah, also part of the Yuman language family, occupied an area along the lower Colorado River and its delta, south of the Quechan and extending into northwestern Mexico (Alvarez de Williams 1983:99). Their habitat was somewhat unique, as the summer floods from the Colorado River would “convert the delta region into a land rich in flora and fauna” (Alvarez de Williams 1983:99). The Cocopah were semi-nomadic, hunter-gatherers who also used the delta region of the lower Colorado River to farm crops including beans, squash, and maize.

They supplemented their crops with wild plants such as mesquite, screw bean pods, cattail reed pollen, and tule roots. Game was plentiful and the Cocopah hunted deer, wild boar, rabbits, wood rats, and beavers. They fished in the rivers using nets made from plant fibers, basketry traps, spears, and, at times, the bow and arrow.

Warfare was part of Cocopah life. As previously noted, the Quechan were one of their enemies. However, unlike the Quechan, the Cocopah had a vast array of weapons, which included hardwood daggers, wooden war clubs, spears, and bows and arrows. Cocopah bows were typically 5 feet or more in length, painted, and the bowstring was made of 3-ply, plant fibers or sinew. Arrows were made from cane or arrow weed and at times were gall-tipped for poison (Alvarez de Williams 1983:107).

The Cocopah were introduced to pottery manufacturing around AD 700 and became very skilled at creating ceramics. They created a variety of vessels used for storage and cooking using the paddle-and-anvil technique. Clay was ground and winnowed, then a temper of ground sherds was added. Firing was done in a shallow pit or open area using mesquite chips, dung, or arrow wood for fuel. The Cocopah also used stone and clamshell knives, stone metates and manos, awls made from wood and bone, and canteens made from gourd or clay for travel (Alvarez de Williams 1983:106).

Occupation of permanent settlements and exploitation of different food sources at different times of the year occurred when enough resources were present to provide year-round subsistence. Evidence for these settlement patterns can be seen in coprolite analyses, which reveal the remains of plant and animal foods available during different seasons (Wilkie 1976, 1978). Trade networks between coastal peoples and the occupants of the desert interior began to develop around AD 1000. This development is apparent in the archaeological record by the exponential increase in shell beads within Colorado Desert sites (Fagan 2003; Becker and Altschul 2008).

Late period assemblages, beginning circa AD 1250, are typified by the profusion of the Desert Side-notched and Cottonwood arrow points, which replace the larger projectile point traditions of earlier eras (Jones et al. 2007). These projectile point types are common throughout California during this period and into the historic period (Justice 2002).

The ethnographic literature establishes that all Native American tribes associated with the project area cremated their dead. All of the tribes used trails for transportation and exploited the environment similarly. Although each group had a specific approach to creating ceramics, these items were traded, along with shells and localized meats and vegetables. Data gathered on the ceramics in the project area show evidence of a variety of ceramic types such as Tizon Brownware and Colorado Buffware. Prehistoric trade networks and trails in the project area may have ultimately brought much of the surface deposits to the project area. Other evidence infers the ritual, domestic and economic use of the project area. Quartz smashes, killed metates, and other unique items observed in proximity to cremations all are indicators of ritual and ceremonial use of the project area. Trails represent both economic (trade routes) and transportation, and are associated with ritual activities. Open camp sites containing hearth features, groundstone, ceramics, and lithic tools represent domestic use, subsistence procurement and processing activities, and settlement patterns in the project area. It is unlikely that surface evidence would directly relate the project area to a particular tribe. Currently, it appears that the project area was exploited primarily by the Kamia and Kumeyaay.

The Kamia and Diegueño occupied the project area during the late prehistoric period. Evidence of that occupation is reflected in artifacts, features, and sites recorded in the project area. Survey crews recorded cremation sites in context with what appears to be Kamia-made ceramics, open camps, and "killed metates." Evidence of migration and/or trade is reflected in the artifacts recorded in the project area, such as a large stone pestle used for high elevation plant processing. Although fish traps are absent, it is possible to infer that the Kamia were exploiting the lacustrine environment. Survey crews recorded possible elements of Kamia culture such as ceramics and cremations, in association with fish bones, at Temporary Site Number EBR-019. Colorado Buffware ceramics observed on this site generally date from 1500 to post AD 1800. Subsurface investigations of Temporary Site Number EBR-019 could provide additional information related to subsistence and settlement patterns of the Kamia and Diegueño.

The frequency and complexity of sites recorded in the project area increase relative to the proximity of the prehistoric Lake Cahuilla shoreline. This pattern may signify the increasing complexities of societies in direct relation to the presence of Lake Cahuilla. It is not possible, based on the surface deposits alone, to determine cultural distinctions or interpret specific subsistence and settlement patterns related to the environment created when Ancient Lake Cahuilla was at the maximum high water mark.

Historic Background

(With minimal updates and editorial contributions, the following text was adapted from URS response to Data Request 124 from Energy Commission Staff.)

Spanish Period (1540 to 1821)

The Spanish Period describes nearly three centuries of Spanish exploration and settlement in the northern Sonoran Desert portion of New Spain, beginning with the 1542 expedition of Juan Rodriguez Cabrillo and ending with the Treaty of Córdoba that established Mexican independence. The period is dominated by Spanish attempts to link their territories in Mexico and New Mexico with their outposts in California and protect their possessions from encroachment by other world powers, such as Britain and Russia. Several expeditions were sent out, especially toward the end of the 18th century, to develop a trail system connecting Sonora to California. One of these expeditions, led by Captain Juan Bautista de Anza, set out in 1774 from the mission in Tubac, south of present-day Tucson, Arizona, to find an appropriate overland route to the mission at San Diego along coastal California. Traveling with a group of soldiers and two Franciscan friars, Anza arrived in February 1774 at the confluence of the Gila and Colorado rivers, where they encountered a party of Yuma Indians, who they described as welcoming and peaceful. They spent a night at another Yuma village and continued the next day across the present-day U.S./Mexico border, arriving at a water storage basin known today as Laguna Maqauta, where they were greeted by an even larger party of Yuma. Admiring the people immensely, Anza described them and their elaborate hair styles in his diary. In March 1774, the Anza party camped southwest of the Yuha Well. They continued from there, eventually reaching the San Gabriel Mission on the coast in March 1774. Several years later, the Yuma Indians reacted to ill treatment by the Spanish and attacked villages established by the Spanish along the Colorado River, killing many of the settlers, including one of the friars who had traveled with the Anza expedition. By the close of the 18th century, no reliable overland route to the settlements along the Pacific coast had been established, and the Spanish continued to rely on sea-going vessels to supply those settlements.

The northern Sonoran Desert was rarely visited by Europeans until the intensive settlement of the 20th century because of the desert's remoteness and nearly waterless environment. One early European explorer of the region was Hernando de Alarcon, believed to be the first Spanish explorer to see the Colorado River in the 1540s. Spanish explorers would visit the desert region over 200 years later as they attempted to locate a more direct travel route between their older and well-established missions in Sonora and New Mexico and the missions of San Diego, San Gabriel, and Monterey. The latter missions were all located along coastal Alta California (northern California) and were on the frontier with Russian fur trappers, who were moving south along the Pacific coast. Thus, as Weber (1992) points out, "the success or failure of New California as a bastion against Russian expansion seemed to depend on the rapid delivery of reinforcements, food, and supplies."

Spanish officials and clerics in California made many attempts during the mid-18th century to establish a reliable supply network. Antonio María de Bucareli, at the urging of Father Junípero Serra, enlisted the aid of the Sonoran frontier officer Captain Juan Bautista de Anza in 1773 to find an appropriate overland route from Sonora to San Diego and on to Monterey. Along with the overland route, a sea venture was also formulated with the effect that both the sea and land routes would send a message to the Russians that Alta California belonged to Spain. Anza acquired the assistance of a small group of soldiers and two Franciscan friars, one of whom was Francisco Garcés, who made the trip through the lower Colorado Desert several times. The Anza-Garcés journey began in 1774 at the mission in Tubac, south of present day Tucson, Arizona. It proceeded south to Altar in the state of Sonora, Mexico, and one month later arrived at the junction of the Gila and Colorado rivers. Two Anza-Garces campsites have been located in the project area of analysis; one of these is north of the project area and one is south.

The corridor that makes up the Anza Trail is a 2.5-mile wide alignment that runs roughly south to north through the project area. According to the National Park Service (NPS), the trail approaches the project area from the south, running past Mount Signal until it comes to Yuha Well (both of these areas are south of the project area boundary). The corridor continues north into the project area and passes generally through the Plaster City area, continuing north to the San Sebastian Marsh where the corridor turns west and into the mountains. In 1996, the NPS published the "Comprehensive Management and Use Plan, Final Environmental Impact Statement, Juan Bautista de Anza National Historic Trail, Arizona California" (Anza Trail Management and Use Plan). Within this document was a summary of the key stops and camping sites the expedition used. The plan lists four sites in Imperial Valley (Mission Purísima Conception; Expedition Camp #42: Pilot Knob; Expedition Camp #47: Wells of Santa Rosa/Yuha Well, and Expedition Camp #49: San Sebastian Marsh/San Felipe Creek). None of these sites fall within the project area. Camp #47 sits just south of the project area boundary, while Camp #49 is located several miles north (http://www.nps.gov/archive/juba/plan/appendB.htm). Within the project area, it is known that the expedition camped in or near Arroyo Seco in the vicinity of the present-day Plaster City OHV area (http://www.solideas.com/DeAnza/TrailGuide/Imperial/index.html).

No archaeological evidence of the Anza expedition has been found in the project area to date. The transitory nature of the expedition, along with the harsh environment that the group passed through, ensured that few physical traces remain. As the 1996 NPS plan notes: "Little historic fabric remains from 1775–76. Even the missions which Anza visited have changed, for they were temporary structures at the time of his visits" (http://www.nps.gov/archive/juba/plan/environment.htm). The expedition was often guided by indigenous tribal members and used established Native American trails, paths, or sites (such as villages). Some Native American sites such as Yuha Well (to the south of the project area) have been surveyed and recorded. It is not known if any archaeological sites directly related to the Anza expedition have been found anywhere along the length of the trail (in Mexico, Arizona, or California). The modern version of the Anza "trail" that runs through the project area is a 2.5-mile wide corridor that follows the rough path of the expedition and it is known that the Anza party stopped at Camp 47 (Yuha Well, south of the project area), before crossing the project area and spending a night at Camp 48, located somewhere near present day Plaster City, and then continuing on to Camp #49: San Sebastian Marsh/San Felipe Creek (north of the project area). The historic corridor is crossed and paralleled by two designated driving routes, BLM Roads 274 and 243, both having the symbol of the Anza Trail emblazoned on road signs.

By early 1774, the Anza-Garcés expedition crossed the Sonoran Desert, encountered the Yuma Indians along the Colorado River, crossed the San Jacinto Mountains, and reached the San Gabriel Mission (Weber 1992). In 1781, José de Gálvez ordered the construction of two outposts along the Colorado River to further secure the overland travel route between Sonora and the California coast: Purísima Concepción, near present-day Yuma, and San Pedro y San Pablo de Bicuñer, near present-day Laguna Dam (Weber 1992). Although Father Garcés was the leading priest for the villages, Teodoro de Croix became the first Comondancia General de Provincias Internas in 1777 (Texas State Historical Association 2001). In effect, de Croix was the commandant for the interior provinces of Mexico and was the person responsible for ensuring the success of the enterprise of the two newly established villages along the Colorado River.

Four years after the creation of the villages, the Yuma Indians, because of the ill treatment caused to them by the Spanish, attacked the villages, killing Father Garcés along with many of the settlers. In 1782, Pedro Fages argued for an increased force to defend against Russian encroachment and to quell Indian uprisings. Although Fages rescued several of the remaining Spanish captives in Yuman custody and managed to inflict heavy damage on the Yuman villages, no peace accords were established between the Yuma Indians and the Spanish. By the close of the 18th century, New Mexico still did not have a reliable overland route to its settlements along the Pacific coast of Alta California and was forced to rely on sea ventures to supply these settlements (Weber 1992).

Mexican Period (1821 to 1848)

The Mexican Period opens with the observation that Spain's influence in the world and its role as a colonial power waned at the beginning of the 19th century following the Napoleonic Wars. As a result, Spain began to relinquish some of its colonies in the New World. In 1821, following other uprisings in Florida and Texas, Augustin de Iturbide led a successful coup of the Spanish colonial government in Mexico City. In August 1821, Spain capitulated and signed the Treaty of Córdoba with Iturbide and the insurrectionists, and Iturbide declared himself Agustin I, emperor of New Spain. His despotic rule did not last long however, as Antonio López de Santa Anna led a successful coup and deposed Iturbide in 1824. Against the backdrop of these larger events, developments in the Sonoran Desert passed relatively unnoticed by the Mexican government, except when horse thieves were chased through the area. In 1826, Sub-Lieutenant Romualdo Pacheco, the aide-de-camp to the governor of Mexican California, and his troops built a small fort approximately 6 miles west of present-day Imperial. After a band of Kumeyaay attacked the post in April 1826 and killed three soldiers, Pacheco abandoned the post and led his remaining troops to San Diego. Imperial County served as the route for the American expedition that ended Mexican rule of California. In 1846, Brigadier-general Stephen Kearney led the Army of the West from Fort Leavenworth, Kansas, that first captured Santa Fe, New Mexico. From there, the Army marched across New Mexico and helped seize Tucson, Arizona. The force then continued west across the Sonoran Desert to San Diego, arriving in January 1847.

The downfall of Spain as a colonial imperialist in the New World likely had its most dramatic beginnings in 1810. The downfall occurred when a group of Anglo-Americans rebelled against the Spanish-controlled government in West Florida and captured the town of Baton Rouge on behalf of the United States government. Because of its domestic problems in the wake of the Napoleonic Wars, Spain could do little to provide economic assistance to its overseas ventures and in 1819 signed a peace accord, the Adams-Onís Treaty, which gave East Florida to the U.S. and de facto control of West Florida to the United States. Texas, a heavily contested region, was to remain under Spanish control.

In 1821, just 2 years after the signing of the Adams-Onís Treaty, Agustin de Iturbide led a successful coup against the Spanish colonial government in Mexico City. Iturbide was an officer in the Spanish military in New Spain who became disenchanted with the current Spanish government. In 1820, he was assigned to suppress an anti-colonial uprising, but instead Iturbide led the coup. In February 1821, Iturbide issued the "Plan of Iguala," which laid the framework for Mexican independence from Spain. By August of 1821, the Spanish government signed the Treaty of Córdoba, which recognized the change of government to Iturbide's insurrection. Soon afterward, in 1822, Iturbide declared himself Agustin I, emperor of New Spain. Because of his despotism, Antonio López de Santa Anna led a successful coup that deposed Iturbide in 1824. However, Iturbide had left a dangerous legacy for Mexico. In 1822, Iturbide permitted Stephen Austin and a small group of Anglo-Americans to construct a settlement inside the border of Texas, more likely as an act of appeasement to limit the increasingly frequent border disputes. This act, however, only furthered the cause of the Anglo-Americans to take control of the southwest.

Few, if any, development activities were conducted in the northern territories of Mexico during this period. The Sonoran Desert was nearly forgotten and only referenced as Indian (Yuman) horse thieves were chased through the desert. In 1826 and 1827, Romualdo Pacheco, who would become the first California-born governor of the State of California and was Sub-Lieutenant, Engineer officer, and aide-de-camp to the governor of Mexican California, made several exploratory expeditions through the region (Stott 1950). In 1831, a group of Anglo-American traders departed St. Louis, headed for Santa Fe, traveled through the Sonoran Desert, and ended in San Diego. One person of note in this trip was Jonathan Trumball Warner of Connecticut, who was a clerk on the expedition (Stott 1950). Warner later acquired San Jose Valley in San Diego County. The valley became known as “Warner’s Ranch,” the name it retains to this day.

American Period (1848 to Present)

The Anglo-American colonies established in Texas in the 1820s eventually rebelled and gained their independence from Mexico in the Texas War of Independence in 1836. The newly established Republic of Texas maintained its independence until 1845, when it petitioned for annexation to the United States.

When this annexation was completed in 1845, during the presidency of James K. Polk, the stage was set for war between an outraged Mexico and the United States. Border tensions escalated and the result was war and the United States invasion of Mexico in 1846. That year, President Polk enlisted the aid of Mormon volunteers to form a battalion and advance on the Mexican army in California. The Mormons already had a large population in the west, particularly in the Salt Lake City, Utah, area. By June 1846, Colonel Stephen W. Kearney, commander of the western army, with the assistance of Mormon leader Brigham Young, recruited 314 Mormon soldiers (Vurtinus 1979). By the fall of 1846, the battalion moved through the southwest toward California and reached San Diego on January 29, 1847. In the process, the western army, with the aid of the Mormon battalion, established garrisons in San Diego, Los Angeles, the mission of San Luis Rey, and established a battery in Cajon Pass, San Bernardino County (Vurtinus 1979).

By 1848, the U.S. had prevailed over the Mexican army and the Treaty of Guadalupe Hidalgo ended the war. By the terms of the treaty, the United States acquired all Mexican territory north and west of the Rio Grande and Gila rivers, including Texas, New Mexico territory, and Alta California. In the same year, Anglo-Americans discovered gold in the mountains of California, and the resulting gold rush brought a huge influx of Anglo-American settlement. This settlement transformed California from a Hispanic backwoods frontier to the new Anglo-American “Golden State,” which was admitted to the Union as the thirty-first state in 1850.

Early Settlement

The settlement of the Imperial Valley owes much of its early history to Dr. Oliver M. Wozencraft. In 1849, Wozencraft, on his way to gold fields near San Bernardino from New Orleans, traveled through the Imperial Valley and noted the soil fertility and potential for arability. He was likely the first Euroamerican to recognize the valley’s potential for agriculture, and he noted that because the Colorado River was much higher than the valley, it would be feasible to irrigate using a gravity canal from the Colorado River (Garnholz 1991).

Wozencraft's opinion of the fertile valley was reaffirmed in 1853 when Jefferson Davis, Secretary of the U.S. War Department, ordered a scientific expedition along the Colorado River for the placement of fortifications. In this expedition, which was led by Lieutenant R.S. Williamson and William Phipps Blake, a professor at Yale College, the particular fertility of the alluvial soil at the southern end of the Salton Trough was noted. Blake prophetically wrote, "It is indeed a serious question, whether a canal would not cause the overflow once more of a vast surface, and refill, to a certain extent, the dry valley of the ancient lake" (Garnholz 1991). Blake's expedition in the Salton Trough was the most scientific of its time and included soil scientists, geologists, geographers, and paleontologists. It was Blake's expedition that first scientifically described how the Colorado River had meandered through the valley, delivered enough silt to block the mouth of the Gulf of California, and recognized that the banks of the current Colorado River course were much higher than that of Imperial Valley (Smith 1979). During the 19th century, the Colorado River flooded the valley in 1840, 1842, 1852, 1859, and 1867 (Garnholz 1991).

Development of Canals and Irrigation

With the information gathered from the scientific expedition, Wozencraft pressed California into granting him approximately 1,600 square miles or 1,024,000 acres (essentially the entire present-day Imperial County and parts of Riverside County). However, the Federal Government retained title to the land in this region of California, and Wozencraft was unable to convince Congress, even with the results of the scientific analysis of the valley, to support his efforts. Wozencraft then approached George Chaffey to finance the project. Chaffey, who would successfully spearhead irrigation projects in San Bernardino County and Australia, was also unconvinced and noted that the "Imperial Valley was to [sic] hot for white men to prosper" (Garnholz 1991). Chaffey would later change his mind and near the end of the 19th century led the effort to irrigate the valley. Still undeterred, Wozencraft hired the Los Angeles County surveyor, Ebenezeer Hadley, in 1860 to draw up a plan to irrigate the valley by diverting the Colorado River through the Alamo River (Garnholz 1991). Wozencraft left California for Washington, D.C. to lobby Congress. He died several years later without ever convincing Congress and never saw his dream fulfilled. Although Wozencraft failed to create an irrigation network, his efforts during the mid-19th century led the way for future development efforts.

Between 1893 and 1894, the Colorado Irrigation Company, under the direction of Chief Engineer Charles R. Rockwood, followed up on Wozencraft's earlier attempts to irrigate the Imperial Valley. Originally known as the "Valley of the Dead," an understandable appellation considering that it receives less than 3 inches of rainfall per year, Charles Rockwood renamed it "Imperial Valley" as part of his grand vision of channelizing the Colorado through thousands of miles of canal lines, with the net effect of irrigating hundreds of thousands of acres of land in the Sonoran Desert (Reisner 1986). Teaming with George Chaffey, head of the California Development Company (CDC), Rockwood, who became the chief engineer of the company in 1901, continued on the plans established by Wozencraft in the mid-19th century to have a canal, referred to as the “main channel,” constructed from the Colorado River through the Imperial Valley using an ancient overflow channel of the Colorado known as the Alamo River (Sperry 1975). Chaffey, to avoid conflict with the Mexican government over land development—the canal was to be developed almost entirely on the south side of the border, which, because it was conducted by a foreign agency, was prohibited by Mexican law—established a subsidiary to the CDC, the Sociedad de Irrigación y Terrenos de la Baja California (Smith 1979). By 1901, the Imperial Valley was irrigated and attracted many new settlers and farmers from the Midwest. In 1907, Imperial County was established from the western portions of San Diego County. The establishment of Imperial County helped boost the population of the valley. In 1902, the towns of Imperial and Calexico were founded, followed in 1905 by El Centro. The 1910 Census reported that 13,591 people lived in the newly formed county. By 1990, that number had grown to 109,303 and there were dozens of cities, towns, and unincorporated communities.

The Coming of the Railroad

The railroad had reached the Imperial Valley several years before the county was organized. The Southern Pacific Railroad established a line from Los Angeles to Yuma in 1877. The line entered the valley near Betram and ran southeast through Niland to Yuma (Farr 1918). This line eventually became part of the famed Sunset Route that linked Los Angeles with New Orleans (Solomon 1999). The Southern Pacific soon had spurs or lines running to Calexico and El Centro, but did not run west to San Diego. In 1906, it was announced that the San Diego and Arizona Railroad (SDAR) had been formed and work soon began on a direct line from San Diego to the Southern Pacific line in El Centro. Construction was difficult and the line proceeded slowly. By 1914, some sections had been finished, including the line between El Centro and Dixieland. But the entire route was not finished until November 1919. The railroads quickly developed iced freight cars that could transport fruit and vegetables grown in the valley, a use that continues today. Pullman service was inaugurated between San Diego and Chicago, and passenger trains ran along this route until 1951, when declining ridership led the Southern Pacific Railroad (which had purchased the SDAR in 1933) to end passenger service along this line (Dodge 1956).

Flood Control

George Chaffey replaced Charles Rockwood at the Colorado Irrigation Company because of his experience in working on canal projects and deep financial interests in seeing the development of the southwest. Under his direction, an extensive canal system was developed in both the Imperial Valley and across the border in Mexico. Diversions were built that took water from the Colorado and channeled it into the Alamo River. Almost immediately it was found that silt deposits, carried by the river, were fouling the diversions, head gates, and canals. In 1905, the water levels coming down the river were lower than usual, and the high levels of silt impeded the flow of water through the gravity-fed system. It was decided that a cut would be made in the side of the river, up-stream from the silted-in portions, to allow a fuller flow. A temporary, wooden structure referred to as the “Chaffey Gate” was constructed with the assumption that the cut would be closed and the gate removed before the spring runoff (Sperry 1975; Tout 1932). Before this could happen, several floods poured down the river, and the fifth one completely destroyed the remaining gates and dams along the canal network system. The Colorado River, which had flowed toward the Gulf of

California, had changed its course and started flooding the Alamo River to the Salton Trough in Imperial Valley. The Salton Sink began to fill, eventually becoming known as the Salton Sea. Frantic efforts were made to close the cut, but the river swept away each one.

Many businesses that were situated along the Salton Trough were threatened by the floodwaters. The Southern Pacific Railroad, which had acquired the CDC, saw its interests threatened, and it took on the task of the flood control. The railroad's president, E.H. Harriman appointed a new engineer and gave him a large budget (Sperry 1975). Harriman and the business leaders of the Valley asked the Federal Government to intervene. President Theodore Roosevelt seemed sympathetic, but told Harriman that with Congress in recess, there was little he could do, though he implied that any funds expended by the railroad would be reimbursed by the government. Ultimately, the Southern Pacific spent $3 million and closed the breach in 1907. When the railroad requested that amount from the federal government, they were turned down—it took almost 22 years of negotiation before Congress finally awarded the railroad $1 million in compensation (Sperry 1975; Tout 1932). It took the construction of the Hoover Dam, which was completed in 1935, to achieve full control over the Colorado River for irrigation purposes.

Introduction of Electric Power to the Region

At about the same time that Rockwood and Chaffey were devising plans to irrigate the Imperial Valley, W.F. Holt was developing an idea to introduce electricity to the region through hydroelectric power. Holt formed the Holton Power Company in 1903 with the purpose of constructing a 40-foot drop on the Alamo River. By 1916, the Holton Power Company was successfully producing enough energy to supply the needs of the entire Imperial Valley. Soon after, the Nevada-California Electric Company acquired the Holton Power Company; however, Nevada-California had problems in producing enough reliable electricity for the expanding agricultural economy of the valley, and the electricity rates to produce the power needed were becoming too high for the average farmer.

The Imperial Irrigation District (IID) was organized in 1911 to acquire the land rights of the defunct CDC, and its Mexican subsidiary Sociedad de Irrigación y Terrenos de la Baja California, from Southern Pacific. By the mid-1920s, IID was delivering water to over 500,000 acres of arable land (IID 2006). The Boulder Canyon Act, passed in 1928, authorized the Bureau of Reclamation to construct Boulder (Hoover) Dam, completed in 1935, along the Colorado River. The Imperial Valley and IID benefited greatly, as the act and the dam provided immediate hydroelectric power to the valley. The act also provided for the construction of the All-American Canal. In 1932, the Secretary of the Interior and IID signed an agreement to allow IID to use the hydroelectric power from the canal system to repay the costs of the canal construction. The All-American Canal was begun in 1934 and the first diesel-generating plant was constructed near Brawley in 1936 (IID 2006). Construction on the canal continued until 1942, when work was interrupted by the U.S. entry into World War II. Work resumed in 1944, and was largely completed by 1948. That same year saw construction begin on the Coachella Canal distribution system, which was completed by 1954 (U.S. Bureau of Reclamation 2008).

These water systems helped develop hundreds of thousands of acres of farmland that produced all types of crops, livestock, and dairy products. In 1910, 87,141 acres of crops (barley, cotton, alfalfa, etc.) were planted, and by 1980, 703,453 acres were being cultivated. The same trend is reflected in cattle production. In 1910, 63,180 head of cattle were being raised in the valley, and that number had risen to 1,046,805 by 1990 (Birdsall 2007).

Railroad lines were not the only transportation system linking the valley to San Diego. Residents of the valley were clamoring for a network of roads, but the terrain made road construction difficult, especially on the eastern side of El Centro, where the shifting sand dunes hampered passage. In 1915, a plank road was built that crossed the Algodones sand dunes and linked Yuma and Holtville. In 1915, construction began on State Highway 80, which ran from San Diego to Imperial Valley. Paved with concrete when it was built, the road stretched across the desert floor, linking towns such as Ocotillo, Plaster City, Dixieland, Seely, and El Centro. In 1926, it was renamed U.S. 80 as part of the burgeoning U.S. highway system (Cooper 2005). In 1929, Imperial County widened and repaved the road (Tout 1932).

Many of these towns and communities had been founded in response to the widespread development of agricultural properties. One such community was Dixieland, located just to the east of the Westside Main Canal. In 1909, there was talk of building another canal even farther west to open more land for agriculture. A town was platted, streets were laid out, and a concrete-and-brick school was built. Its founders hoped to serve area farms that would be coming and the travelers using the highway, but Dixieland never met the expectations of its developers. The western canal was never built, and the would-be town never had enough people living in it to incorporate (Tout 1932). Today only the shell of the former school and a few modern buildings remain on the north and south sides of U.S. 80.

Mining Developments

Farther west on U.S. 80 is Plaster City, a large drywall production facility that stretches for almost a mile along both sides of the highway. In 1920, Samuel Dunaway formed the Imperial Gypsum and Oil Company to extract the estimated 25 million-ton gypsum deposit that lay on the western edge of the valley. An ore processing plant was built at a spot along U.S. 80 and the San Diego and Arizona rail line, and a narrow gage rail spur brought the ore down from the mines. In 1922, the first load of processed gypsum was shipped from the valley. The company soon ran into financial troubles and was acquired by the Portland Cement Company in 1924, which expanded the processing facility. In 1927, a fire destroyed the original plant, leading to extensive rebuilding (Tout 1932). In 1946, the U.S. Gypsum Company (today known as USG) purchased the plant and greatly expanded it. In 2001–2004, USG spent almost $300 million modernizing and rebuilding the plant yet again.

The Desert Training Center Presence

The dry climate and large expanses of land brought the U.S. military to the valley during World War II. In early 1942, Major General George S. Patton was ordered to find a site suitable for large army units (divisions, corps, and armies) to train. A California native, Patton had participated in training exercises in the Mojave Desert. The army began acquiring land for the Desert Training Center (DTC), also known as the California/Arizona Maneuver Area, which eventually covered 18,000 square miles, making it the largest military base in the world. The area stretched from the outskirts of Pomona, California, east toward Phoenix, Arizona, south toward Yuma, Arizona, and north to the tip of Nevada (California State Military Museum 2008). Much of the land that lay to the east of the Salton Sea and El Centro was consolidated into the DTC, and it is possible that training may have taken place in the open desert north and south of Plaster City as well. Artifacts including 0.50-caliber and 20-millimeter shells, military benchmarks, and ammunition belts were recorded during survey and appear to date to this period.

Camp Seeley

The U.S. Army established Camp Seeley on the northern edge of Seeley, California in November 1940. It was originally established and built to accommodate certain components of the 11th Cavalry Horse Regiment, including the First Squadron, Provisional Squadron, and the Regimental headquarters. Camp Seeley was originally used to train men and horses in desert terrain and horse skills. Additional men were assigned to Camp Seeley in March 1941, when approximately 700 draftees were added to the regiment. Training continued through December 7, 1941, when the Japanese attacked Pearl Harbor. The Regiment at Camp Seeley was ordered to force-march to Camp Lockett, 5 miles southwest along the Mexican Border at the town of Campo. After the 11th Cavalry left Camp Seeley, horse-drawn artillery units began to move into the camp (CSMM 2009).

The U.S. Army acquired 16,295 acres of land, located approximately 10 to 12 miles northwest and southwest of El Centro, California, on August 21, 1941. The next day, they acquired an additional 1,280 acres of land (CSMM 2009; U.S. Army 1997). The land was to become the Camp's vehicle proving ground and ordnance training centers. The Quartermaster Corps initially operated the testing and proving grounds, but after August 1942, these operations reverted to the Ordnance Department, which designed, developed, procured, supplied, and maintained the U.S. Army's motor vehicles (U.S. Army 1999). Known first as the Quartermaster Desert Test Command, with its principal units stationed at Camp Seeley, it would later be known as the Ordnance Desert Proving Ground (U.S. Army 1999; Way 1997). The Desert Test Command initially established the Camp Seeley Proving Ground to ascertain the traction capabilities and limitations of the U.S. Army's motorized vehicles in the desert and to determine other impacts of dust and dirt on the vehicles while in desert terrain. This was done in preparation for the November 1942 planned invasion of North Africa (U.S. Army 1999).

Early vehicle testing in the first few months of 1942, while under the supervision of the Quartermaster Corps, enabled the development of low-pressure tires that enabled large vehicles to cross sandy areas with greater ease (U.S. Army 1999). New synthetic rubber tires were developed in cooperation with some U.S. tire manufacturers to provide flotation and traction in the soft sands. These tires were very effective and needed little or no alteration to traverse the soft terrain, unlike standard tires that required a reduction of air pressure by 40 % to maneuver through the sands (Way 1997). Desert testing on combat vehicles did not occur at the testing grounds until March 1943, two months after fighting in North Africa had ceased. Tanks were tested at the facility, but not until March of 1943. The tank's wheel and track assemblies were to be tested against desert conditions, specifically the synthetic rubber components. The testing was expanded beyond the rubber components to include all aspects of desert conditions and focused on the impacts of high temperatures and dust on rubber parts, fuels, and lubricants (U.S. Army 1999).

Major Jean Engler supervised Camp Seeley and its desert testing program. He was interested in exploring the limitations of military vehicles under adverse natural and man-made conditions. The area's temperatures were consistent with the temperatures and conditions of North Africa. Because the availability of specification fuel in combat was unpredictable, tests were needed to determine the ability of the vehicles to use various octane fuels. Major Engler was also concerned about the ability of the vehicles to maneuver in soft sands, which were usually located in dry riverbeds. Open, hard-packed terrain was not always the best route to travel due to lack of protection from enemy fire. Dry riverbeds offered better protection, but vehicles bogged down in the soft sands, which could limit or halt movement. The fuel tests were organized on June 8, 1942. A test track was chosen north of U.S. 80, between the gypsum spur at Plaster City and west of Dixieland, in the large Coyote dry wash. One tank course and one wheeled vehicle course were set up for the tests. Seventeen vehicles were tested, including all 9 models of the Quartermaster trucks and jeeps. Actual testing started on June 16, 1942 and was completed on July 10, 1942 (Way 1997).

Sand and Gravel Mining

The area has historically supported several types of mining activities, but the mining of building materials (crushed stone, gravel, sand, clays, lime, sodium, and gypsum) predominated (CSMB 1916, 1921). Early mining facilities include the Plaster City plant, whose mine was located several miles north of the project area. Another plaster mining operation was located approximately 4 to 5 miles west of Plaster City (CSMB 1916, 1921). A pure white quartz sand deposit, used for making glass and porcelain, is reported to be located near the Boulevard (U.S. 80), 1 mile from the San Diego and Arizona Railroad and 7 miles north of Coyote Wells. The deposit is 50 feet thick and stretches for one-quarter mile (CSMB 1916, 1921). As the demand for building and manufacturing materials increased by the 1920s, due to population increase and the ongoing construction of roads throughout the county, additional mines began to appear in the area.

Several historic sand and gravel pits are located inside the project area. The Wixon Gravel Pit, which consists of three distinct areas of sand or gravel open-pit mining, is located on the eastern edge of Section 5 of Township 16 South, Range 11 East. This open-pit mine is distinguished by linear and round cuts that are serviced by a packed dirt road leading to it from a dirt road east of Dunaway Road. The exact opening date of the gravel mine is unknown, but it is shown as a "gravel pit" on a 1940 U.S. Geological Survey (USGS) map, and the unimproved dirt access road is also shown (USGS 1940). A previous issue of that map, a 1915 reprint of a 1908 map, shows no gravel pits or roads within the project area. It should be noted that the map is marked "sand" just north of this gravel pit (U.S. Army Corps of Engineers 1915). A 1943 U.S. Army Corps of Engineers map shows the gravel pit and access road in the same place as the 1940 map, but is now labeled as the "Wixon Gravel Pit" (U.S. Army Corps of Engineers 1944).

Located north of the Wixon Gravel Pit, near the "sand" marked on the 1915 map, is another open sand or gravel pit. This open-pit mine is located in the southwest quarter of Section 10 of Township 16 South, Range 11 East. The mine consists of a large open-pit bowl and a dirt access road leading to it from a dirt road located east of Dunaway Road. The exact date for the opening of the gravel mine is unknown, but it is shown on a 1940 USGS map with a mine symbol, and the unimproved dirt access road is also shown (USGS 1940). On the 1915 reprint of the 1908 map, neither this mine nor any other roads are shown within the project area (U.S. Army Corps of Engineers 1915). A 1943 U.S. Army Corps of Engineers map shows the open-pit mine and an access road in the same place as the 1940 map (U.S. Army Corps of Engineers 1944).

A large complex of open gravel pits is located in Sections 7, 18, and 19 of Township 16 South, Range 11 East. Two gravel pits are also located north of U.S. 80 in Sections 1 and 12 of Township 16 South, Range 10 East. These open-pit mines consist of linear and round cuts associated with loose surface, graded dirt roads leading south from U.S. 80. One of the mines is shown as the "County Gravel Pit" on the 1940 USGS map near the center of Section 18 of Township 16 South, Range 11 East. The loose surface, graded dirt access road is also shown leading to the mine (USGS 1940). No gravel pits or roads are shown at this location on the 1915 reprint of the 1908 map (U.S. Army Corps of Engineers 1915). A 1943 U.S. Army Corps of Engineers map shows the open-pit mine and an access road in the same place as the 1940 map, and it is still named the "County Gravel Pit" (U.S. Army Corps of Engineers 1944). The BLM General Land Office (GLO) plat map for this township indicates that most of the land in Section 18 was used as a material site, with a date of action on August 5, 1940 and a closing date of October 6, 1995 (BLM GLO 2004). A material's site usually refers to an area used to store road maintenance materials. This is consistent with its designation as the County Gravel Pit, which would most likely use sand or gravel for road construction or maintenance.

Energy Infrastructure Development

The volcanic history of the Salton Sea basin has made it an ideal location for the development of geothermal energy. Active extraction of geothermal energy is already underway in the area around Obsidian Butte at the southern end of the Salton Sea and additional plants have been proposed. Whereas the previous economic development had been limited to corridors (primarily railroads, transmission lines, roads, and canals) or small horizontal spaces (the geothermal plants and gravel and gypsum mines) modern development is, for the first time, destined to affect large parcels of the landscape. Proposed solar energy projects covering hundreds and thousands of acres are under study and development near Borrego Springs and Ocotillo Wells, in the Salton Sea and the Yuha Desert. In summary, much of the desert area of the ALCIS has been proposed for solar development (and multiple locations in the mountainous area of the ALCIS have been proposed for wind energy development). There are extensive and potentially significant cultural resources throughout the ALCIS, many of which may be determined to be eligible for nomination to the NRHP. The careful assessment of cumulative impacts will be essential to the protection of the cultural heritage of the project area of analysis.

It is also clear that the shoreline of Ancient Lake Cahuilla, the area of project analysis and the extent of the ALCIS extend across the international border into northern Mexico. The initiatives that are underway for cooperative alternate energy development between Imperial County and northern Mexico also need to be considered in assessments of cumulative effect and assessments of impact on cultural resources.

C.3.4.2 CULTURAL RESOURCES INVENTORY

The analysis of the proposed action requires the development of a cultural resources inventory for the area where the action has the potential to disturb or destroy cultural resources. The development of the inventory has entailed the identification, description, and preliminary interpretation of the cultural resources in that area. More specifically, the effort to develop the inventory has involved a sequence of investigatory phases that includes background research, consultation with Native Americans and the broader public, primary field research, and the interpretation of the resultant information.

History of the Investigation

The inventory effort began with the development of a geographic scope of investigation that would capture enough information to support a defensible cultural resources analysis. The scope of investigation for the proposed action includes considerations of both the geographic extent and the intensity of the geographic coverage of each investigation that contributes to the inventory effort. The geographic extent of the inventory investigations includes the different areas in which the proposed action has the potential to directly or indirectly effect cultural resources. The total of such areas is the project area of analysis (see “The Project Area of Analysis and the Area of Potential Impacts” subsection, above).

The intensity of the geographic coverage for the inventory investigations is different for the background research and the primary field research, and has evolved during the development of the cultural resources inventory. The ideal intensity of the geographic coverage in a project area of analysis would be 100 % for all investigations done for or in that area. The development of the cultural resources inventory for the proposed action began with the intent of conducting both the background research and the primary field research to cover 100 % of the project area of analysis. The background research does include this level of coverage. The primary field research does not.

The geographic coverage for primary field research in the project area of analysis presently includes a useable sample of 25% of the archaeological sites found in that area and a 100% sample of built-environment resources and ethnographic resources, also in that area. The applicant began the primary field research on the archaeology of the project area of analysis with a 100% pedestrian survey to identify and document every archaeological site on the surface of that area (Cultural Resources Table 6) (SES 2008c, SES 2008e). The reported results of that survey were too coarse in descriptive resolution to enable the reliable identification and interpretation of the archaeological resources found. BLM and Energy Commission staff sought early (December 2008) in the discovery phase of the Energy Commission siting case for the proposed action to acquire, among other information, more precise and objective data on the character and the physical contexts of the surface archaeological resources (see Data Requests 111–113 and 115–117, CEC 2008h). The March 2009 responses of the applicant to the initial round of cultural resources data requests (SES 2009h), while offering useful information on the geomorphology of the project area of analysis as a whole (see responses to Data Requests 111 and 112, SES 2009h), did not adequately identify and articulate the physical context of each surface archaeological site, or describe and interpret the contents of and the spatial patterns that structure the material culture deposits that make up each site, notwithstanding additional fieldwork that the applicant had done. As a consequence, the information on the surface archaeological sites remained insufficient to support defensible assessments of the potential impacts that the implementation of the proposed action may have on historically significant sites.

As BLM and Energy Commission staff began to develop a second round of data requests, information became available that made the coarse resolution of the original archaeological survey data more objectively apparent. A May 8, 2009 preliminary field check by BLM staff and a third-party consultant of the accuracy of the archaeological site descriptions that the applicant had prepared in response to Data Request 117 found enough variation between those descriptions and the actual character of the resources on the ground to warrant concern. Energy Commission and BLM staff agreed that a formal field check of a controlled sample of the archaeological sites that had been found on the original archaeological survey would be a useful way to quantify the accuracy of the March 2009 revisions to the archaeological site descriptions and would allow staff to more securely account for the range of error in the descriptions during the preparation of the analysis. From May 20 to May 22, 2009, a third-party consultant to the BLM conducted a ground-truthing survey of an approximately 20% sample of the 302 archaeological sites then known for the project area of analysis (LSA 2009a). The BLM’s third-party consultant found that the documentation by the applicant for approximately 43% of the archaeological sites in the project area of analysis was probably inadequate and would require additional fieldwork to correct. The consultant also concluded that the applicant may not have found approximately 8% of the archaeological sites in the project area of analysis and that approximately 5% of the archaeological sites that the applicant has found may not actually be archaeological sites. The consultant concluded that the extant documentation for the archaeological sites in the project area of analysis was inadequate for assessing either the historical significance of the resources or the impacts that the proposed action would have on them (LSA 2009, p. 27).

The second round of data requests for cultural resources (CEC 2009x) took into account the results of the third-party ground-truthing survey. The primary focus of Data Requests 142–144 was for the applicant to conduct a program to revisit and re-record 100% of the newly found archaeological sites in the project area for the proposed action. The requests provided the applicant with a field protocol for the re-recordation effort and recommended that the applicant more precisely observe and document the geomorphic context of each site. The requests also asked the applicant to revise the March 2009 descriptions of the newly found archaeological sites in the proposed project area to more closely conform to the original guidance in Data Requests 113 and 117. In response to a request from the applicant at the May 7, 2009 second data response workshop in El Centro, staff provided a template to the applicant, as an attachment to the second round data requests, to ease the further revision of the archaeological site descriptions. The data requests and the attachment were published on June 18, 2009.

The applicant had begun the archaeological site re-recordation effort the previous day having seen the draft second round data requests and having sought further clarification from staff on the re-recordation field protocol.

Coordination on Programmatic Agreement for Section 106 Compliance

Concurrent with the discovery phase of the Energy Commission siting process, BLM and Energy Commission staff were developing an alternate approach to jointly satisfy agency NEPA, Section 106, and CEQA regulatory obligations. From approximately March 9 through August 12, 2009, Energy Commission staff, in consultation with BLM staff, conducted a series of intra- and interagency discussions about how Energy Commission staff might use the Section 106 consultation process to satisfy Energy Commission obligations to comply with CEQA in relation to cultural resources. More specifically, Energy Commission staff sought to participate in the development and execution of a type of agreement document that BLM staff came to the decision to use to comply with Section 106, which the BLM would use, in turn, to satisfy their obligations under NEPA to consider the impacts of the proposed action on cultural resources. The subject type of agreement document is known as a complex undertaking programmatic agreement (PA). The purpose of a complex undertaking PA is to afford a Federal agency a procedural mechanism to provide for the phased identification, evaluation and deferment of final evaluations for projects involving large land areas and corridors, as well as, the consideration and treatment of historically significant cultural resources when the impacts of a proposed action on such resources, for different reasons, cannot be fully determined prior to the approval of that action. A complex undertaking PA is a document that sets out a regulatory process which deviates from the standard Section 106 process and which addresses circumstances unique to a particular proposed action. The regulatory process set out in a complex undertaking PA is the result of negotiations among the lead Federal agency, other involved Federal agencies, the Advisory Council on Historic Preservation, the State Historic Preservation Officer, Native American groups, state and local governments, and the interested public. Such a regulatory process provides for the post-decision completion of steps in the standard Section 106 process that normally occur prior to a decision on a proposed action. On August 12, 2009, Energy Commission staff got internal approval to participate in the Section 106 consultation process for the proposed action under consideration here and to recommend to the Energy Commission the regulatory process that would be negotiated under Section 106 as the means to satisfy agency obligations under its CEQA certified regulatory program.

BLM staff, in consultation with Energy Commission staff, subsequently began to initiate formal consultation on the development of the complex undertaking PA and to implement the broad outline of the regulatory process that would become the framework for that document. BLM and Energy Commission staff came to the decision to base the present cultural resources analysis on a statistically valid, 25% sample of the archaeological sites known from surface observation, on 100% of built-environment resources, and on 100% of known ethnographic resources. BLM and Energy Commission staff believe that a controlled and well-documented 25% sample of the archaeological sites on the surface of the project area of analysis is a sufficient basis for a reliable assessment of the potential impacts of the proposed action on that class of cultural resources and for the development of general processes and specific programs and protocols to resolve any significant impacts that the analysis may identify. The proposed PA will stipulate the execution of a program to evaluate the historical significance of archaeological landscapes and districts, archaeological site types, and individual archaeological sites, refinements to the character of the potential impacts of the proposed action on different aspects of the archaeological resource base, and refinements to and the execution of multiple treatment plans to resolve those potential impacts that are found to be significant.

In anticipation of the August 12, 2009 internal Energy Commission decision to approve Energy Commission staff participation in the Section 106 consultation for the proposed action, BLM and Energy Commission staff began the effort to select and conclude the documentation of the 25% sample of the archaeological sites that would serve as a major component of the present analysis just prior to the date of that decision. BLM staff directed the third-party consultant who had conducted the May 2009 ground-truthing survey to develop a stratified random sample of 25% of the known archaeological sites on the surface of the project area of analysis (LSA 2009b). The applicant was to then use that sample to conclude the archaeological site re-recordation program that the applicant had begun in late June 2009. The applicant began the implementation of the sample on August 26, 2009, concluded the fieldwork for the sample on September 28, 2009, and submitted the second round of revisions to the site descriptions for the sample sites 17 days later on October 15, 2009 (SES 2009x). BLM and Energy Commission staff made the decision that the October 15, 2009 results of the 25% re-recordation effort (Cultural Resources Table 7) would be taken as sufficient to assess the potential impacts of the proposed action on archaeological resources. The results of that effort therefore provide the basis of the analysis of the archaeological resource base in the present section.

The “Cultural Resources Inventory” subsection covers the methods and results of each phase of the background research and of the new field investigations that have been done to construct a cultural resources inventory for the project area of analysis. The subsection includes discussions of the archival research and the consultations that have taken place with Native American groups and the broader public about the project area of analysis as a whole. The subsection also provides discussions of the recent field investigations for the analysis. The investigations include a geoarchaeology study of the project area, the original pedestrian archaeological survey of the project area of analysis and the 25% re-recordation effort, and built-environment and ethnographic resource surveys. Separate subsections below explore the historical significance of the cultural resources found, assess the potential impacts of the proposed action on significant cultural resources and on previously unidentified, buried archaeological resources, and propose mitigation measures for all significant impacts.

Background Research

The background research for the present analysis employs information that the applicant and the BLM gathered from literature and records 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 contribute to the design and the interpretation of the field research that will serve to complete the inventory.

Literature and Records Searches

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 South Coast Information Center (SCIC) at San Diego State University and the Southeast Information Center (SIC) at the Imperial Valley Desert College Museum, both of the California Historical Resources Information System (CHRIS). (Note: subsequently, the SIC has been closed and all records are now on file at the SCIC.)

CHRIS Records Search

Methods

Records searches were conducted for all of the project area and a 1-mile radius around it. On January 16, 2007, Matthew Armstrong, a URS Archaeologist, requested a records search from the SIC. A second records search was conducted by Elizabeth Roberts, URS Archaeologist, on February 26 and 27, 2008 at the SIC to cover the area of the proposed transmission line, which had not been identified at the time of the initial records search.

In addition to these efforts, site-specific and general primary and secondary research was conducted at the Imperial Valley Pioneer Society; Imperial County Free Library – El Centro Branch; San Diego State University Library; University of California, San Diego Geisel Library and Mandeville Special Collections; San Diego Public Library; and numerous online resources (e.g., Calisphere – A World of Digital Resources, California Historic Topographic Map Collection). The research was conducted between April 3 and 7, 2008. Overall, the research provided insight into the historic contexts and themes of the area and specific information concerning the properties within the project area (e.g., date of construction, architect/builder, and historic landownership).

Results

Previous Investigations

The records search investigations identified 31 records related to cultural resources investigations conducted within 1 mile of the project area. Several of these records were for projects conducted within the IVS Project area. The following is a list of projects conducted within the IVS Project area boundary: point surveys 0853–0873; area surveys 09113, 0737, 0251, 0330, 0325, 0262, 0251, 0172, 01073, 0972, 0962, and 0960; and portions of linear surveys 0233, 0297, 0310, 0311, 0314, 0315, 0316, 0319, and 0946. The 31 reports are listed in Cultural Resources Table 2.

Cultural Resources Table 2
Previous Surveys in the Records Search Area

NADB No.	Project Name	Prepared By	Prepared For	Date Submitted
1100108	Archaeological Survey of the Yuha Basin, Imperial County	Jay von Werlhof and Sherilee von Werlhof	U.S. Department of the Interior, Bureau of Land Management, Riverside, CA	June 20, 1977
1100207	Class II Cultural Resource Inventory of the East Mesa and West Mesa Regions, Imperial Valley, California	WESTEC Services, Inc.	USDI, BLM, Riverside, CA, Contract No. YA-512-CT9-75	July 1980
1100233	Cultural Resources Study of a Proposed Electric Transmission Line From Jade to the Sand Hills, Imperial Valley, California	Carol J. Walker, Charles S. Bull, Jay von Werlhof	San Diego Gas & Electric	February 13, 1981
1100251	Volume II Appendix Phase II, Archaeo-logical Survey of the La Rosita 230 kV Interconnection Project	Cultural Systems Research, Inc.	San Diego Gas & Electric	November 1981
1100262	Archaeological Field Investigation of the Cultural Resources Associated with the Proposed Imperial Valley Substation (7A) Access Road	Cultural Systems Research, Inc.	San Diego Gas & Electric	March 1982
1100279	Volume I Phase III Archaeological Survey of the Mountain Springs (Jade) to Sand Hills Portion of the APE/SDG&E Interconnection Project 500 kV Transmission Line	Cultural Systems Research, Inc.	San Diego Gas & Electric	1982
1100286	South Brawley Prospect Geothermal Overlay Zone Draft Program Environmental Impact Report Volume I	County of Imperial	Unknown	January 28, 1983
1100289	Cultural Resource Inventory of the La Rosita to Imperial Valley Interconnection Project 230 kV Transmission Line, Imperial Valley, California	Greenwood and Associates	Unknown	March 18, 1983

NADB No.	Project Name	Prepared By	Prepared For	Date Submitted
1100297	Archaeological Examinations of Petty Ray Geophysical Transects on West Mesa	Jay von Werlhof, Imperial Valley College	BLM, El Centro Area Office	June 15, 1983
1100301	Appendix B Cultural Resources Inventory for Thirty Proposed Asset Management Parcels in Imperial Valley, California	Patrick Welch	Unknown	July 1983
1100310	Southwest Powerlink Cultural Resources Management Plan Volume III-B	Jan Townsend, WIRTH Environmental Services	San Diego Gas & Electric	March 1984
1100311	Southwest Powerlink Cultural Resources Management Plan Volume II	Jan Townsend, WIRTH Environmental Services	San Diego Gas & Electric	March 1984
1100314	Volume III Data Recovery on the Mountain Springs (Jade) to the Sand Hills Segment-Southwest Powerlink Project	M. Steven Shackley, WIRTH Environmental Services	San Diego Gas & Electric	September 1983
1100315	Volume IV Data Recovery on the Mountain Springs (Jade) to the Sand Hills Segment-Southwest Powerlink Project	M. Steven Shackley, WIRTH Environmental Services	San Diego Gas & Electric	April 1984
1100316	Volume II – Appendixes Data Recovery on the Mountain Spring (Jade) to Sand Hills Segment, Southwest Powerlink Project	M. Steven Shackley, WIRTH Environmental Services	San Diego Gas & Electric	April 1984
1100319	Volume I Archaeological Investigations in the Western Colorado Desert: A Socio-ecological Approach	M. Steven Shackley, WIRTH Environmental Services	San Diego Gas & Electric	April 1984
1100325	West Mesa Resource Survey and Site Evaluation, Imperial Valley, California	WESTEC Services, Inc.	USDI, BLM, El Centro Area Office	1984
1100330	Camps and Quarries After the Lake: A Survey of 547 Acres Below the Relic Lake Cahuilla Shoreline in the Vicinity of Interstate 8 and Dunaway Road	Mooney-Lettieri and Associates	USDI, BLM	January 1985

NADB No.	Project Name	Prepared By	Prepared For	Date Submitted
1100446	Yuha Rehab and Mechanical Restoration	Unknown	USDI, BLM, El Centro Area Office	April 29, 2003
1100737	Desert Material Sites: West Imperial County Bear, Coyote, Plaster City, Underpass, Yuha	Unknown	Unknown	May 1989
1100804	AT&T Wireless Services Facility No. IM004, Imperial Valley, California	Curt Duke, LSA Associates, Inc.	GeoTrans, Inc.	March 29, 2002
1100820	Cultural Resources Survey and Assess-ment of a Cellular Phone Tower Emplacement and Associated Access Road Along Old Highway 80 Near Dixieland, Imperial Valley, California	Professional Archaeological Services	Phase One, Inc.	May 2000
1100853	NEPA 2000-55, CA-42103 Hunter's Alien Waters	Unknown	USDI, BLM, El Centro Field Office	March 7, 2001
1100873	NEPA 2001-51, CA Hunter's Alien Waters FY2001	Unknown	USDI, BLM, El Centro Field Office	October 18, 2001
1100892	NEPA 2001-39, CA-42904 NTCHCA, inc. DBA Rio-Tel Communication site	Unknown	USDI, BLM, El Centro Field Office	July 17, 2001
1100916	Section 106 Consultation Request for American Tower Corporation Cell Site CA7 – New Site #58	Phase One Inc. SM	Unknown	May 2000
1100984	Proposed Cellular Phone Communications Tower & Facility, Evan Hughes Highway, Plaster City, California	Unknown	Unknown	April 18, 2005
1101057	Cultural Resources Study of the Mount Signal and Dixie Ranch, Imperial County Prison Alternatives, Imperial County, California	ERC Environmental and Energy Services Company, Inc.	California Department of Corrections Planning and Construction Division	January 1990

NADB No.	Project Name	Prepared By	Prepared For	Date Submitted
1101073	Cultural Resource Survey of a 230 kV Transmission Corridor from the Imperial Valley Substation to the International Border with Mexico	Judy A. Berryman, Ph.D.	SEMPRA Energy	September 11, 2001
1100757	Review of Alamosa PCS Site #82502-020, Imperial County, CA	Environmental Biologist, Inc. Ohio 43209	Unknown	Unknown
CA-670-2007-93/ CA 47740-01	Proposed Geotechnical Investigations for The Stirling Energy Systems Solar Two Site Imperial County, CA	URS Corporation Denver, CO	El Centro Field Office BLM 1661 South Fourth Street El Centro, CA 92243	
	San Diego Gas & Electric Company's Sunrise Powerlink Project	SDG&E, San Diego, CA	El Centro Field Office BLM 1661 South Fourth Street El Centro, CA 92243	July 2008

Source: SES 2008e.

Notes:
APE = Area of Potential Impacts
BLM = Bureau of Land Management
CA = California
DBA = doing business as
FY = fiscal year
Inc. = Incorporated
kV = kilovolt
NADB = National Archaeological Database
NEPA = National Environmental Policy Act of 1969
No. = number
SDG&E = San Diego Gas & Electric
USDI = United States Department of the Interior

Previously Recorded Sites

The records search investigations identified 432 previously recorded cultural resource sites within the project area. Two of these resources were re-located during recent surface surveys. Cultural Resources Table 3 summarizes these findings.

Cultural Resources Table 3
Previously Recorded Cultural Resource Sites in the Project Area

Trinomial	Site Type	Dimensions
IMP-0112	Cremation Site	15 to 20 m × 15 to 20 m × 1 ft
IMP-0114	Lithic Scatter	20 m × 30 m
IMP-0269	Probable Seasonal Area	480 m × 890 m
IMP-0321	Yuman Site	Not on form
IMP-0364	Probable Seasonal Campsite	120 m × 130 m
IMP-0383	Temporary Campsite	11 m × 11 m
IMP-0453	Pottery Shards	Not on form

Trinomial	Site Type	Dimensions
IMP-0456	Temporary Campsite	0.5 acre
IMP-0721	Ceramic Scatter - Small Campsite	3 m × 3 m
IMP-0722	Ceramic Scatter	1 m × 1 m
IMP-0723	Lithic Workshop	3 m × 3 m
IMP-0730	Cairn on Low Terrace - 65 Stones	2 m × 1 m
IMP-0731	Lithic Scatter	10 m × 10 m
IMP-0732	Lithic Workshop	2 m × 2 m
IMP-0733	Lithic Workshop	2 m × 2 m
IMP-0734	Lithic Workshop	1 m × 2 m
IMP-0735	Cairn of Porphyry Rock	90 cm × 90 cm × 7 cm
IMP-0737	Cairn	112 cm × 180 cm × 24 cm
IMP-0738	Lithic Workshop and 3 Tools	7 m × 3 m
IMP-0739-I	Ridge-Backed Scraper	103 mm × 83 mm × 27 mm
IMP-0740-I	(Isolate); Fist Axe	158 mm × 70 mm × 70 mm
IMP-0741	Cairn	1 m × 1 m × 20 cm
IMP-0743	Ceramic Scatter	20 m × 5 m
IMP-0744	Trail Marker	1 m × 1 m
IMP-0745	Trail	25 m × 25 m
IMP-0746	Ceramic Scatter - Campsite	50 m × 30 m
IMP-0747-I	Scraper	1 m × 1 m
IMP-0748	Cairn	2 m × 1 m
IMP-0749	Trail Marker	2 m × 2 m
IMP-0750	Ceramic Scatter	2 m × 3 m
IMP-0753	Ceramic Scatter	15 m × 4 m
IMP-0754	Ceramic Scatter	9 m × 8 m
IMP-0755	Ceramic Scatter	11 m × 8 m
IMP-0756	Hearth and Ceramic Scatter	24 m × 8 m
IMP-0758	Mound of Pebbles on a Sand Base	1 m × 1 m 35 cm × 7 cm
IMP-0759	Trail	80 m × 35 cm
IMP-0760	Lithic Workshop	30 m × 40 m × 20 cm
IMP-0764	Trail	804 m × 3 m
IMP-0776	Cleared Sandy Area with Ring of Pebbles	1 m × 1 m
IMP-0777	Trail	1,609 m × 1 m
IMP-0778	Fire Pit	1 m × 1 m × 14.5 cm
IMP-0780	Fire Site	Not on form
IMP-0808	Trail	402 m × 1 m
IMP-0928	Temporary Camp	3 m × 3 m
IMP-0929	Temporary Camp	3 m × 3 m
IMP-0930	Temporary Camp	2 m × 2 m
IMP-0932	Small Lithic Workshop	2 m × 2 m
IMP-0934	Lithic Workshop	2 m × 2 m
IMP-0935	Lithic Workshop, Malpais or SD I	1 m × 1 m

Trinomial	Site Type	Dimensions
IMP-0936	Small Lithic Workshop, Malpais	1 m × 1 m
IMP-0937	Assemblage of Porphyry Tools and Debitage; Lithic Workshop, Malpais	2 m × 2 m
IMP-0938	Lithic Workshop, Malpais	2 m × 2 m
IMP-0939	Lithic Workshop, Malpais	1 m × 1 m
IMP-0940	Lithic Workshop, Malpais	1 m × 1 m
IMP-0941	Lithic Workshop, Malpais	2 m × 1 m
IMP-0942	Lithic Workshop, Malpais	3 m × 3 m
IMP-0943	Lithic Workshop, Malpais	5 m × 6 m
IMP-0944	Lithic Workshop, Malpais	10 m (area)
IMP-0945	Small Lithic Workshop, Malpais	2 m × 2 m
IMP-0946	Lithic Workshop, Malpais	2 m × 2 m
IMP-0947	Sleeping Circle	400 cm × 280 cm
IMP-0948	Sleeping Circle	350 cm × 340 cm
IMP-0949	Sleeping Circle	470 cm × 400 cm
IMP-0950	Sleeping Circle	400 cm × 360 cm
IMP-0951	Sleeping Circle	350 cm × 370 cm
IMP-0952	Sleeping Circle	600 cm × 400 cm
IMP-0953	Sleeping Circle	400 cm × 300 cm
IMP-0954	Sleeping Circle	450 cm × 450 cm
IMP-0956	Trail	1,207 m × 1 m
IMP-0958	Cairn	1 m × 2 m
IMP-0959	Cairn	1 m × 1 m
IMP-0960	Lithic Workshop	2 m × 3 m
IMP-0961	Tools Along Trail	500 m × 1 m
IMP-0962	3 Scrapers, Possible Lithic Site	6 m × 6 m
IMP-0963	Trail	805 m × 6 m
IMP-0964	Cairn, Lithic Scatter	Not on form
IMP-0966	Agave Pit	Not on form
IMP-0972	Lithic Workshop	60.9 cm × 70.9 cm
IMP-0973	Lithic Workshop, Malpais	2 m × 2 m
IMP-0974	Temporary Campsite, Malpais	5 m × 6 m
IMP-0989	Trail, Probable Yuman	402 m × 1 m
IMP-0990	Cairn (or Monument), Probable Yuman	1 m × 1 m
IMP-0991	Temporary Campsite, Yuman	30 m × 30 m
IMP-0992	Temporary Campsite, Yuman	150 m × 50 m
IMP-0993	Cremation Site, Yuman	3 m × 3 m
IMP-0994	Temporary Campsite, Yuman	3 m × 3 m
IMP-0995	Temporary Campsite, Yuman	30 m × 30 m
IMP-0996	Temporary Campsite, Yuman	30 m × 30 m
IMP-0997	Cremation Site, Yuman	3 m × 3 m
IMP-0998	Temporary Campsite, Yuman	3 m × 3 m

Trinomial	Site Type	Dimensions
IMP-0999	Scattered Lithic Workshop, Yuman	15 m × 15 m
IMP-1000	Trail	50 m (length)
IMP-1001	Temporary Campsite, San Dieguito	5 m × 5 m
IMP-1002	Temporary Campsite, San Dieguito	8 m × 8 m
IMP-1003	Lithic Workshop, San Dieguito	1 m × 1 m
IMP-1006	Temporary Campsite, Yuman	10 m × 10 m
IMP-1007	Lithic Workshop, Yuman	10 m × 10 m
IMP-1009	05e: Lithic Scatter	600 m × 400 m
IMP-1010	Sleeping Circle	225 cm × 5 cm × 5 cm
IMP-1011	Sleeping Circles	320 cm × 5 cm × 5 cm
IMP-1012	Temporary Campsite, Yuman	15 m × 15 m
IMP-1013	Lithic Workshop, San Dieguito I	15 m × 15 m
IMP-1014	Trail	35 m × 1 m
IMP-1015	Temporary Campsite and Lithic Workshop	30 m × 15 m
IMP-1033	Ceramic and Lithic Scatter With Cairns	20 m × 36 m
IMP-1034	Cairn	2 m × 2 m
IMP-1035	Cairn	2 m × 2 m
IMP-1036	Cairn	2 m × 2 m
IMP-1037	Cairn	2 m × 2 m
IMP-1042	Temporary Camp with Loci	23 m × 25 m
IMP-1066	Small Lithic Workshop	1.5 m × 1 m
IMP-1067	Trail	208 m × 1 m
IMP-1069	Lithic Workshop, Malpais	Not on form
IMP-1070	Lithic Workshops	2 m × 4 m
IMP-1071	Campsite	100 m × 100 m
IMP-1072	Lithic Workshop and Cairn, Malpais	30 m × 50 m
IMP-1075	Lithic Workshop	100 m × 50 m
IMP-1078	Lithic Workshop, Mound of 19 Cobbles on Sand Base	33 m × 50 m
IMP-1122	Lithic Workshop, Cairns	15 m × 15 m
IMP-1408	Lithic Scatter, Ceramic Scatter	65 m × 40 m
IMP-1411	Felsitic Flake (Isolate)	1 m × 1 m
IMP-1412	Pot Sherd (Isolate)	1 m × 1 m
IMP-1413	Pottery and Lithic Scatters	1,700 m × 250 m
IMP-1417	6 Sherds	8 m × 4 m
IMP-1418	3 Pot Sherds	10 m × 10 m
IMP-1419	Lithic Scatter, Pottery Locus	40 m × 40 m
IMP-1420	Pottery Scatter and Felsitic Flake Scatter	20 m × 30 m
IMP-1426	Village	10 m × 100 m
IMP-1597	Sleeping Circle	68 m × 3 m
IMP-1661	Pottery Scatter and Tools	Not on form
IMP-1662	Temporary Campsite	75.5 m × 38.4 m
IMP-1663	Campsite	3 m × 7.5 m

Trinomial	Site Type	Dimensions
IMP-1724	Indian Trail Northeast	Not on form
IMP-1744	Crossed Express and Indian Trail	Not on form
IMP-1745	Crossed Express and Indian Trail	Not on form
IMP-1746	Crossed Express and Indian Trail	Not on form
IMP-1996	Lithic Workshop	3 m × 4 m
IMP-1997	Lithic Workshop with Chips	2 m × 3 m
IMP-1999	Scraper, Mano, and Destroyed Evidence	1 m × 0.5 m
IMP-2000	Lithic Workshop with Tools, Cores, and Debitage	8 m × 8 m
IMP-2001	Random Artifact in Extended Lithic Workshop	8 m × 5 m
IMP-2002	Single Artifact Along Extended Lithic Workshop	12 m × 12 m
IMP-2003	Miscellaneous Artifacts in Extended Lithic Area	1 m × 1 m
IMP-2004	Miscellaneous Tools in Extended Lithic Site	1 m × 1 m
IMP-2005	Single Artifact in Extended Lithic Area	1 m × 1 m
IMP-2006	Lithic Workshop with Tools, Cores, and Debitage	1 m × 1 m
IMP-2009	Lithic Workshop with Cores, Debitage, and Tools	10 m × 10 m
IMP-2010	Lithic Workshop	Not on form
IMP-2011	Lithic Workshops	50 m × 50 m
IMP-2013	Single Artifact Amid Misc. Worked Material	10 m × 10 m
IMP-2024	Miscellaneous Artifacts	1 m × 1 m
IMP-2025	Lithic Workshop	4 m × 4 m
IMP-2026	Lithic Workshops	3 m × 3 m
IMP-2027	Lithic Workshop with Combination Tools	5 m × 5 m
IMP-2028	Lithic Workshop	Not on form
IMP-2029	Chopper, Lithic Workshop	Not on form
IMP-2030	Single Artifact (Isolate)	1 m × 1 m
IMP-2032	Lithic Reduction Station	3 m × 3 m
IMP-2033	Chipping Station	10 m × 2 m
IMP-2034	Lithic Workshop	7.6 m × 7.6 m
IMP-2035	Single Artifact (Isolate)	1 m × 1 m
IMP-2036	Punctate And Debitage	1 m × 1 m
IMP-2038	Porphyry Core with Debitage	Not on form
IMP-2041	Lithic Workshop	7 m × 7 m
IMP-2043	Lithic Workshop	1.5 m × 1.5 m
IMP-2044	Lithic Workshop	2 m × 2 m
IMP-2046	Lithic Workshop	2 m × 2 m
IMP-2071	Lithic Workshop	6 m × 6 m
IMP-2073	Chipping Station, Scrapers, Knives, Spokes Have	1 m × 2 m
IMP-2074	Lithic Scatter; Probably San Dieguito Site	1,001 m × 5 m
IMP-2075	Core, Gray Porphyry, 2 Choppers	3 m × 3 m
IMP-2076	Core and 3 Choppers	5 m × 5 m
IMP-2077	Core, Chopper, Debitage, and Scraper	30.4 m × 9.1 m
IMP-2078	Choppers and Core	30.4 m × 21.3 m

Trinomial	Site Type	Dimensions
IMP-2081	3 Tools, Choppers, and Scraper	1 m × 30 m
IMP-2082	Chopper and 2 Cores	3 m × 18 m
IMP-2084	Chopper, 2 Cores, and Knife	5 m × 5 m
IMP-2085	Tools	5 m × 5 m
IMP-2086	Lithic	15 m × 30 m
IMP-2087	Chipping Station	10 m × 10 m
IMP-2088	Lithic Site	15 m × 15 m
IMP-2089	Lithic Tools	5 m × 5 m
IMP-2092	Lithic Tools	30 m × 10 m
IMP-2093	Chipping Station	30 m × 5 m
IMP-2094	Lithic Tools	30 m × 30 m
IMP-2095	Chipping Station	5 m × 5 m
IMP-2096	Lithic Site	15 m × 5 m
IMP-2097	Lithic	30 m × 5 m
IMP-2098	Possible Agave Pit with Tools	2.5 m × 7.3 m
IMP-2099	Lithic	1 m × 1 m
IMP-2100	Random Tools	10 m × 10 m
IMP-2105	Lithic Station	5 m × 5 m
IMP-2106	Lithic Workshop With Tool	10 m × 10 m
IMP-2107	Sleeping Circle	2 m × 2 m
IMP-2112	Lithic Workshop	53.3 m × 45.7 m
IMP-2122	Lithic Scatter with Tools	5 m × 5 m
IMP-2137	Lithic Workshop	3 m × 3 m
IMP-2139	Lithic Scatter	2 m × 2 m
IMP-2141	Lithic, Fist Axe, Core and Debitage	2 m × 2 m
IMP-2144	Lithic, Core and Small Knife	1 m × 1 m
IMP-2145	Random Tools at Pottery Scatter Site	1 m × 1 m
IMP-2147	Lithic Chips and Hammerstone	2 m × 2 m
IMP-2149	Lithic Flakes	1 m × 1 m
IMP-2154	Lithic, Core, and Flakes	1 m × 1 m
IMP-2156	Lithic Flakes	1 m × 1 m
IMP-2157	Lithic Tools	2 m × 2 m
IMP-2158	Lithic Flakes and Hammerstone	1 m × 1 m
IMP-2176	Lithic Tools	1 m × 1 m
IMP-2177	Lithic Workshop and Sleeping Circles	30 m × 10 m
IMP-2178	Lithic Workshop, Chopper Core, Domed Scraper Plane	50 m × 10 m
IMP-2179	Lithic Workshop, Fist Chopper	11 m × 1 m
IMP-2180	Trail	15 m × 1 m
IMP-2181	Lithic Tool, Ovoid Scraper (Isolate)	1 m × 1 m
IMP-2182	Lithic Tools and Trail	1 m × 1 m
IMP-2183	Lithic Assemblage	1 m × 1 m
IMP-2185	Lithic Tool and Trail	1 m × 1 m

Trinomial	Site Type	Dimensions
IMP-2189	Lithic Workshop and Cairn	30 m × 30 m
IMP-2190	Lithic Workshop	3 m × 3 m
IMP-2193	Flaking Station	2 m × 2 m
IMP-2194	Flaking Station	2 m × 2 m
IMP-2195	Flaking Station	2 m × 2 m
IMP-2196	Lithic Station and Worked Tools	30 m × 30 m
IMP-2197	Lithic Station	2 m × 2 m
IMP-2198	Lithic Station	2 m × 2 m
IMP-2200	Lithic Station	1 m × 1 m
IMP-2202	Lithic Workshop (3 Choppers)	20 m × 5 m
IMP-2203	Lithic Workshop (3 Choppers)	5 m × 3 m
IMP-2204	Lithic Workshop (Core and Debitage)	1 m × 1 m
IMP-2205	Sleeping Circle, 3 Flaking Stations	10 m × 10 m
IMP-2207	Lithic, Fist Axe and Hammerstone	2 m × 1 m
IMP-2211	Lithic Workshop (Core and 3 Choppers)	3 m × 3 m
IMP-2212	Lithic, Fist Axe, Knife	2 m × 1 m
IMP-2213	Lithic Workshop	60 m × 20 m
IMP-2214	Lithic Workshop and Tools	12 m × 3 m
IMP-2216	Lithic, Knife	1 m × 1 m
IMP-2217	Lithic, Knife	1 m × 1 m
IMP-2218	Lithic, Chopper	1 m × 1 m
IMP-2219	Lithic Workshop	2 m × 3 m
IMP-2223	Lithic	4 m × 2 m
IMP-2224	Lithic, Hammerstone and Knife	2 m × 1 m
IMP-2225	Lithic Workshop	3 m × 2 m
IMP-2226	Lithic (3 Cores)	3 m × 1 m
IMP-2231	Lithic Workshop	2 m × 2 m
IMP-2232	Lithic Workshop (Spokeshave and Flakes)	1 m × 2 m
IMP-2234	Lithic Workshop	1 m × 1 m
IMP-2235	Lithic Workshop (Core and Debitage)	2 m × 2 m
IMP-2236	Lithic Workshop	25 m × 10 m
IMP-2239	Lithic, 2 Choppers and 1 Scraper	1 m × 3 m
IMP-2241	Lithic	5 m × 2 m
IMP-2247	Lithic, Knife Scraper Core	3 m × 1 m
IMP-2251	Lithic Workshop	1 m × 1 m
IMP-2302	Lithic Workshop	30 m × 30 m
IMP-2303	Lithic Workshop	50 m × 50 m
IMP-2304	Lithic Workshop	30 m × 100 m
IMP-2305	Lithic Workshop	100 m × 30 m
IMP-2306	Single Artifact	Multiple dimensions given
IMP-2315	Lithic Workshop	6 m × 3 m
IMP-2322	Lithic Workshop (Green Porphyry and Quartz)	60 m × 48 m

Trinomial	Site Type	Dimensions
IMP-2332	Lithic Workshop with Core	3 m × 1.5 m
IMP-2333	Lithic Workshop	2.4 m × 2.4 m
IMP-2334	Lithic Workshop, 5 Tools	6 m × 4.5 m
IMP-2341	Circle With Artifacts in Center	1 m × 1 m
IMP-2351	3 Artifacts	Not on form
IMP-2353	Single Artifact	1 m × 1 m
IMP-2359	Lithic Workshop	1 m × 1 m
IMP-2360	Cairn	1 m × 1 m
IMP-2361	Lithic Workshop	9.12 m2
IMP-2362	Single Artifact	1 m × 1 m
IMP-2363	Lithic Workshop	30 m × 30 m
IMP-2364	Lithic Workshop	Multiple dimensions given
IMP-2371	Lithic Workshop	30 m × 30 m
IMP-2372	Lithic Workshop	15 m × 15 m
IMP-2373	Intersection of 2 Trails	300 m × 1 m
IMP-2438	Lithic Scatter	10 m × 10 m
IMP-2439	2 Cores and A Few Flakes	10 m × 10 m
IMP-2440	2 Cores and 20 Bone Fragments	5 m × 5 m
IMP-2441	2 Cores and Flakes	5 m × 5 m
IMP-2442	5 Fired Red Sandstone Deposits	100 m × 60 m
IMP-2443	Lithic Workshop, Green Porphyry	130 m × 10 m
IMP-2478	Possible Trail	100 m × 1 m
IMP-2479	Scraper, 2 Cores, and Flakes	1 m × 1 m
IMP-2764	Lithic Scatter with Tools	40 m × 15 m
IMP-3052	Ceramic Scatter	3 m × 3 m
IMP-3191-H	Ruins of the Dixieland School	Not on form
IMP-3192-H	Dixieland Cafe and Grocery Store	Not on form
IMP-3276-H	San Felipe Creek	8 ft × 6 in
IMP-3396-H	Crossed Express Trail	Not on form
IMP-3399-H	Crossed Wagon Road	Not on form
IMP-3400-H	Wagon Road (unable to relocate 1978)	Not on form
IMP-3401-H	Cross Wagon Road	Not on form
IMP-3402-H	Wagon Road (unable to relocate 1978)	Not on form
IMP-3505-H	Military Occupation (Heavy) Mounts, Cairns, Trail	402.3 m (length)
IMP-3745	Lithic Scatter	5 m × 5 m
IMP-3747	Single Potsherd (Isolate)	Not on form
IMP-3748	Isolate (Hammerstone)	10 cm × 8 cm × 6 cm
IMP-3750	Chipping Station	3 m × 3 m
IMP-3751	Lithic Scatter	1 m × 1 m
IMP-3752	Lithic Scatter with 4 Loci	25 m × 30 m
IMP-3753	Isolate (Bifacial Scraper)	NA
IMP-3754	Lithic Scatter with 2 Loci	5 m × 10 m

Trinomial	Site Type	Dimensions
IMP-3755	Lithic Scatter	3 m × 3 m
IMP-3756	Lithic Scatter	1 m × 1 m
IMP-3757	Lithic Scatter with Tools	11 m × 3 m
IMP-3758	Lithic Scatter with Tools	130 m × 60 m
IMP-3759	Lithic Scatter with Tools	50 m × 50 m
IMP-3760	Lithic Scatter with 4 Loci	60 m × 60 m
IMP-3761-H	Historic Trash Dump with 2 Loci	15 m × 20 m
IMP-3763	Lithic Scatter with Tools	30 m × 20 m
IMP-3764	Lithic Scatter with Tools	40 m × 15 m
IMP-3765	Lithic Scatter	20 m × 10 m
IMP-3766	Pottery Scatter with Lithics	10 m × 0.8 m
IMP-3767	Single Flake (Isolate)	NA
IMP-3768	Lithic Scatter with 2 Loci	25 m × 45 m
IMP-3769	Lithic Scatter with Tools	0.5 m × 0.5 m
IMP-3770	Single Flake (Isolate)	NA
IMP-3771	Lithic Scatter with Tools	60 m × 60 m
IMP-3772	Lithic Scatter with Tools	15 m × 15 m
IMP-3773	Lithic Scatter with Tools	20 m × 15 m
IMP-3774	Lithics, 2 Cores	1 m × 1 m
IMP-3775	Lithics, Flake and Scraper	1 m × 1 m
IMP-3776	Discoid Scraper (Isolate)	Not on form
IMP-3777	Core (Isolate)	Not on form
IMP-3778	Chopper (Isolate)	13 cm × 10 cm × 4.5 cm
IMP-3779	Lithics, Core and Flake	0.2 m × 0.2 m
IMP-3782	Ceramic Scatter and Trail Segment	Not on form
IMP-3783	Ceramic Scatter	3 m × 3 m
IMP-3784	Chopper (Isolate)	Not on form
IMP-3785	Lithic Scatter	2 m × 2 m
IMP-3786	Flake (Isolate)	0.5 m × 0.5 m
IMP-3788	Lithic Scatter	20 m × 60 m
IMP-3789	Lithic Scatter	3 m × 3 m
IMP-3790	Lithic Scatter	7 m × 2 m
IMP-3791	Lithic Scatter, Ceramic Scatter	1 m × 1 m
IMP-4121	Lithic Scatter	1350 m × 350 m
IMP-4189	Temporary Campsite	100 m × 50 m
IMP-4190	Lithic Scatter	6 m × 8 m
IMP-4191	Lithic Scatter	0 to 10 sq m
IMP-4192	Lithic (Isolate)	0.5 m × 0.5 m
IMP-4193-H	Historic Trash Dump	2 m × 2 m
IMP-4237	Temporary Campsite	800 m × 800 m
IMP-4244	Lithic Scatter	100 m × 35 m
IMP-4245-H	Historic Trash Dump	10 m × 10 m

Trinomial	Site Type	Dimensions
IMP-4246	Ceramic and Lithic Isolates	5 m × 15 m
IMP-4247	Lithic Workshop	200 m × 80 m
IMP-4248	Ceramic Scatter, Lithic Scatter	20 m × 5 m
IMP-4337	Lithic (Isolate)	0.5 m × 0.5 m
IMP-4338	Chipping Station	2 m × 1 m
IMP-4339	Isolated Locale	1 m × 1 m
IMP-4340	Lithic (Isolate)	0.5 m × 0.5 m
IMP-4341	Chipping Circle	1 m × 1 m
IMP-4342	Lithic (Isolate)	1 m × 1 m
IMP-4343	Temporary Campsite	80 m × 50 m
IMP-4344	Lithic Scatter; Possible Temporary Campsite	160 m × 340 m
IMP-4346	Temporary Campsite	30 m × 30 m
IMP-4347	Lithic Scatter	10 m × 55 m
IMP-4348	Temporary Campsite/Village	Multiple dimensions given
IMP-4349	Lithic Scatter, Ceramic Scatter, Temporary Campsite	500 m × 85 m
IMP-4350	Lithic Scatter, Ceramic Scatter	85 m × 135 m
IMP-4351	Lithic Scatter, Ceramic Scatter	25 m × 105 m
IMP-4352	Lithic Scatter, Temporary Campsite	40 m × 60 m
IMP-4354	Lithic Scatter	30 m × 30 m
IMP-4380	Trail and Lithic Workshop	91 m × 91 m
IMP-4381	Geoglyph and Hearths	30 m × 30 m
IMP-4390-H	Historic Trash Dump	5 m × 5 m
IMP-4469	Temporary Campsite, 2 Pot Drops, Lithic Scatter	20 m × 15 m
IMP-4470	Pot Drop	20 m × 10 m
IMP-4471	Pottery Scatter	Not on form
IMP-4515	Ceramic Scatter	10 m × 10 m
IMP-4517	16, Isolate: Chalcedony Flake	Not on form
IMP-4540	Temporary Campsite, Lithic Scatter	100 m × 400 m
IMP-4541	Lithic Scatter, Chipping Circle	0.5 m × 1 m
IMP-4544	3 Felsitic Flakes	1 m × 1 m
IMP-4546	3 Felsitic Flakes	5 m × 5 m
IMP-4548	Lithic Scatter, Flakes	70 m × 100 m
IMP-4573	Lithic Scatter	50 m × 30 m
IMP-4575	Lithic Scatter	5 m × 5 m
IMP-4577	Lithic Scatter	60 m × 40 m
IMP-4578	Chipping Circle	2 m × 2 m
IMP-4581	Lithic Workshop	5 m × 5 m
IMP-4582	Lithic Scatter	80 m × 80 m
IMP-4583	Lithic Workshop	5 m × 5 m
IMP-4584	Chipping Circle	5 m × 5 m
IMP-4585	Temporary Campsite	30 m × 30 m
IMP-4602	Pottery Scatter	25 m × 25 m

Trinomial	Site Type	Dimensions
IMP-4673	Isolate: Flake	Not on form
IMP-4677	Lithic and Pottery Scatter	2 acres (area)
IMP-4750	Lithic Scatter	1 m × 1 m
IMP-4752	Hearths, Lithic Scatter	120 m × 60 m
IMP-4838	Floor of Lake Cahuilla	Not on form
IMP-4875	Chipping Circle	0.5 m × 0.5 m
IMP-4954	Lithic Site with Cairn	220 m × 120 m
IMP-5042	Temporary Campsite	75 m × 75 m
IMP-5043	Ceramic Scatter, Lithic Scatter	24 m × 30 m
IMP-5044	Ceramic Scatter, Lithic Scatter	7 m × 5 m
IMP-5058	Ceramic Scatter	5 m × 2 m
IMP-5189	Lithic Scatter, Possible Shell Midden, Ceramics, and Trails	60 m × 80 m
IMP-5190	Trail, Porphyry Side Scraper, Porphyry Punctate	100 m × 6 m
IMP-5197	Scatter of Andesite Flakes, Sherds, and Burnt Bone	50 m × 25 m
IMP-5198	Low-Density Lithic Scatter	50 m × 25 m
IMP-5199	Chipping Circle	15 m × 25 m
IMP-5200	Chipping Circle	22 m × 2 m
IMP-5201	Pumice Cache and Low-Density Lithic Scatter	15 m × 15 m
IMP-5202	Temporary Campsite	29 m × 20 m
IMP-5203	Temporary Campsite	15 m × 10 m
IMP-5204	Temporary Campsite	170 m × 30 m
IMP-5205	Temporary Camp - Lithic Scatter	100 m × 100 m
IMP-5225	Geoglyph	5 m × 10 m
IMP-5277	Metate Fragment	Not on form
IMP-5700	Lithic Workshop	Not on form
IMP-5701	3 Primary Flakes, 1 Secondary Flake, 1 Hammerstone	Not on form
IMP-5704	Lithic Scatter	Not on form
IMP-5705	Lithic Scatter	Not on form
IMP-5707	Lithic Scatter	Not on form
IMP-5715	Ceramic Scatter	Not on form
IMP-5719	Lithic Scatter	Not on form
IMP-6680	Green Porphery Scraping Tool	Not on form
IMP-6681	Green Porphery Flake	Not on form
IMP-6687	Lithic Workshop	1 m × 1 m
IMP-7816-H	Historic Railroad Stop	100 m × 40 m
IMP-7868-H	Historic Trash Scatter on Open Desert	8 m × 12 m
IMP-8509	Irrigation Canal, Concrete Culvers	0.31 mi length × 15.1 ft width
IMP-8654	Ceramic Scatter, Lithic Scatter	17 m × 17 m
IMP-8656	Lithic Scatter	58 m × 83 m
IMP-8667	Lithic Scatter	5 m × 5 m
IMP-8668	Lithic Scatter	11 m × 80 m

Trinomial	Site Type	Dimensions
IMP-8669	Ceramic Scatter, Lithic Scatter	50 m × 60 m
IMP-8698	Ceramic Scatter, Lithic Scatter	15 m × 25 m
IMP-8720	Lithic Scatter	37 m × 140 m
IMP-8721	Lithic Scatter	35 m × 100 m
IMP-8738	Lithic Scatter	5 m × 5 m
IMP-8740	Lithic Scatter	5 m × 5 m
IMP-8743	Lithic Scatter	5 m × 20 m
IMP-8745	Lithic Scatter	6 m × 6 m
IMP-8749	Cairns, Lithic Scatter	16 m × 49 m

Source: SES 2008e.
Notes:
cm = centimeter
ft = feet
IMP = Imperial County
in = inches
m = meter
mi = mile
mm = millimeter
NA = not applicable
sq = square

Discussion of Previously Recorded Sites

With minimal updates and editorial contributions, the following subsection was adapted from URS (2008: Section 5). Most of these sites were recorded before the invention of Global Positioning Station (GPS) technology. The ability to adequately place the locations of small sites on a 1:24,000-scale USGS topographic map in an environment such as the project area was quite difficult without GPS equipment. With the state of technology at the time, land surveying equipment would most likely have been required to achieve comparable results. The URS review of the original DPR forms reveals that most of the sites were shown only as a point on the 1:24,000 scale map, and intensive efforts to pinpoint locations do not appear to have been made. All of the forms show Universal Transverse Mercator (UTM) locations for these sites, and these UTM coordinates were used by the present survey to map previous site locations. However, the UTM coordinates appear to have been added later to the forms, based on the original points on the maps. These factors suggest that the location information for these sites is inaccurate. The site descriptions on these older forms are also usually quite general, which adds to the difficulty of relocating the sites. Finally, in many cases, no sketch maps were made of the sites, another complicating factor in site relocations.

The applicant’s consultant is confident that many of the previously recorded sites were re-located, but could not be matched on an individual basis to previously recorded DPR forms. Only two of these previously recorded cultural resources (CA-IMP-2083 [current temporary number JM-9, Locus B] and CA-IMP-3762 [current temporary number EBR-001]) were definitively re-located during the course of the field investigations carried out by the consultant. While the differences in reliability between the older techniques and the modern techniques are clearly understood, the inability to more closely correlate the results of the current cultural resources inventory with the previous inventories makes it impossible to arrive at a final determination of the number and density of the cultural resources in the project area.

Previously recorded sites that were re-located:

- CA-IMP-2083: chipping station with core, chopper, and debitage; 5 m × 5 m; and
- CA-IMP-3762: lithic scatter and trail segment; 30 m × 0.3 m.

These issues also plagued efforts to re-locate previously recorded sites associated with the Yuha District. A portion of the Yuha Basin Discontiguous District is located within the records search boundary. The majority of the district is located south of the project area.

The SCIC searched all relevant previously recorded cultural resources site records and previous investigations completed within the project area and a one mile search radius around it. Information reviewed included location maps for all previously recorded prehistoric and historical archaeological sites and isolates; DPR forms and updates for all cultural resources previously identified; previous investigation boundaries; and National Archaeological Database citations for associated reports, historic maps, and historical addresses.

C.3.4.3 CONSULTATIONS

Native American Consultation

Native American Heritage Commission Sacred Lands File Search Results

A Sacred Lands File search request was submitted to the Native American Heritage Commission (NAHC) on January 4, 2008. The response letter dated January 7, 2008, established that the Sacred Lands File (SLF) search for the project area failed to indicate the presence of Native American cultural resources in the immediate project area. A second letter from the NAHC dated January 23, 2008, indicated that the original request and response had been misplaced. This letter established that the SLF search did indicate the presence of Native American cultural resources in the project area. The letter indicated consultation as the best way to avoid unanticipated discoveries. A list of contacts for adjacent tribes was enclosed. Specifically, the letter recommended contacting Carmen Lucas for insight regarding specific information about the cultural resource location in the project area.

With the filing of the IVS Project application for a ROW, the BLM, as the lead federal agency, initiated tribal consultation pursuant to the Executive Memorandum of April 29, 1994, as well as other relevant laws and regulations, including Section 106 of the NHPA. To date, 12 tribes and 15 additional tribal contacts have been identified and invited to consult on this project (see Appendix I to the PA, Appendix A to the present section, for complete summary of Native American consultation). The BLM initiated formal government-to-government consultation by letter in January 2008 and has followed up with 3 additional letters since that time. With each letter, the BLM endeavored to provide updates on the status of the environmental review process including cultural resource inventories, invite the tribes into government-to-government consultation, and request their help in identifying any issues or concerns. The BLM also requested their assistance in identifying any sacred sites and places of traditional religious and cultural significance which might be affected by the proposed project.

Since January 2008, the BLM has responded to requests for both formal and informal meetings with tribal governments, tribal staff or tribal members. Additionally, several written comments from tribal contacts have been received to date. As the environmental review and Section 106 consultation processes move forward for this project, the BLM will continue to consult with tribes and interested tribal members on issues or concerns related to cultural resources and the PA or other resources and issues of concern. Information gathering through field visits to the project area and interviews with various tribal members began in early 2009. Tribal members including those from the Cocopah Indian Tribe, the Quechan Tribe, and the Kwaaymii have visited the project area and viewed cultural resources. Further field visits and tours are expected in the upcoming months as the cultural resources inventory report is finalized and Section 106 consultation continues.

Regarding the presence of human remains within the project area of analysis (APE), various tribal elders have spoken of the intense spiritual value that cremations have to Native Americans in the region at a December 4, 2009 meeting in El Centro the purpose of which was to initiate the development of the proposed PA.

Other Consultation

The ACHP, the SHPO, the National Trust for Historic Preservation, the Anza Society, the U.S. Army Corps of Engineers, NPS, and Tessera Solar, are organizations or agencies that have been invited into consultation on the development of the Programmatic Agreement. Those consulations are ongoing.

New Inventory Investigations

Geoarchaeology Study

With minimal updates and editorial contributions, the following subsection was adapted from URS (SES 2009h).

Introduction

The following discussion is largely focused on identifying those portions of the project area that have the potential for the presence of subsurface archaeological deposits even though there are no surface manifestations. It has been shown that some alluvial landforms, with desert pavements that have evolved through accretion of eolian silts and sands and the gradual bearing of larger clasts to the surface, have the potential for containing buried archaeology (Ahlstrom and Roberts 2001). However, a representative portion of this archaeological deposit would be incorporated into the surface pavement through the same accretionary process. Thus, these older surfaces are not likely to contain archaeological sites that are not at least partially evident on the surface.

Geomorphologic processes have played a major role in the differential preservation of archaeological sites in the Colorado Desert. Paleoindian/San Dieguito Culture sites (ca. 10,000–8,000 BP) and Early Archaic sites (ca. 8,000–4,000 BP) are extremely rare, especially at lower elevations within the region. These early sites are typified by sparse remains on desert pavements, often on mesas and terraces overlooking larger washes. Schaefer (1994:64) suggests that “these are zones where a variety of plant and animal resources could be located and where water would at least be seasonally available.”

However, it is much more likely that this is simply a matter of landscape development since the Late Pleistocene; these mesas and terraces, with well developed desert pavements, represent the differential preservation of older land surfaces at higher elevations.

The project area, and lower elevations within the Colorado Desert in general, appear to have experienced climatic and vegetation regimes similar to today for most of the Holocene (Schaefer 1994:60–63). The creosote scrub habitat that typifies the project area was established at lower elevations by the Late Pleistocene, indicating that people inhabiting the area would have had access to similar natural resources throughout much of the prehistoric period. Numerous studies that have focused on lower areas have shown much less environmental change, likely due to the preponderance of precipitation in these low-lying areas within the rain shadow of large mountain ranges (Weide 1976). Within the project area, the major fluctuation in available resources through time and the concomitant placement of various site types on the landscape are directly related to the episodic filling and desiccation of Lake Cahuilla. These episodes in turn generated the push-pull effect on prehistoric populations, with immigrants being attracted during episodes of filling and emigrants being pushed out during episodes of desiccation.

One cannot use the record of Lake Cahuilla high and low stands as indicators of local environmental change. Lake fluctuations within the Salton Sea basin are primarily related to structural changes in the Lower Colorado delta, and the construction or breaching of a natural dike. These changes may or may not be environmentally dependent, and thus have little bearing on the timing of deposition-erosion cycles in the Yuha Desert. Instead, one must rely on environmental fluctuation data from nearby regions, such as the Mojave Desert, for the timing of these events. Two later episodes of fan deposition occurred around 3,000 years ago, likely associated with changes in the North American Monsoon and an increase in effective moisture at the onset of the Late Holocene, and again during the past 1,000 years, possibly due to climate changes associated with the Medieval Climatic Anomaly. These periods of punctuated fan deposition correspond with those observed elsewhere in the region, and are assumed to have affected the IVS Project area as well.

Identification of Major Landforms within the Project Area

The IVS Project area represents a microcosm of the geomorphic conditions that exist in the Yuha Desert. Pliocene and Pleistocene non-marine sedimentary rock outcrops are located along the southern boundary of the project area. These formations mantle the uplifted Pliocene marine outcrops, which form the Yuha Buttes, just south of the project area. The non-marine rock outcrops within the project area are heavily dissected (eroded) and mantled by Quaternary fan piedmonts. More recent fan aprons issue from the leading edge of these piedmonts and reach to the paleo-shoreline of Lake Cahuilla, where various beach deposits are also located. As with most large alluvial fans, these Quaternary landforms are actually composed of numerous remnants and more recent deposits of varying ages. By examining the relationship between these landform components, relative age estimates can be developed, conclusions can be drawn as to the depositional history of that landform, and the potential of each landform to harbor buried paleosols of appropriate age can be determined.

Dating Alluvial Desert Deposits in the Project Area

The major landforms within the Yuha/West Mesa region were largely constructed during Pleistocene time or earlier (California Department of Conservation 1984; Strand 1962). As suggested by Peterson (1981:4), by "mid-Pleistocene time … parts of these major landforms [began to be] cut away by periodic erosion or buried by periodic sedimentation … This resulted in a mosaic of old, remnant land surfaces and relatively young land surfaces." The age of alluvial deposits within the project area is of central concern because it is the single most important factor in constraining the possibility of buried archaeological deposits. Older land surfaces—those that were deposited prior to human occupation in the Americas (ca. 13,000 years ago) and which are still exposed on the surface—have very little possibility of containing buried archaeological deposits. On the other hand, younger land surfaces, if deposited in the right location, with low enough energy, may bury and preserve archaeological material previously deposited on an older surface. However, if these younger deposits unconformably overlie heavily eroded older formations, any archaeological sites that may originally have been deposited on the older surface would have been destroyed.

Unfortunately, dating of alluvial fan deposits is difficult and there is significant variation in the precision of various methods used in determining relative and numerical ages (McDonald et al. 2003:190). Two primary, non-chronometric methods are used for determining the age of desert alluvial landforms: soil development and desert pavement development. Both of these methods are heavily dependent on environmental factors such as temperature, precipitation, and parent material. As such, they are most effective within a confined relatively homogeneous area, such as the project area.

While desert pavement formation is dependent on factors of time and climate, parent material also plays a major role. In general, alluvium derived from plutonic (e.g., granitic) sources form much weaker pavement—with fewer interlocking stones and less evident varnish—than volcanic and limestone sources (McDonald et al. 2003:193). In the project area, granite is the dominant parent material within the older fan piedmont. Some portions of the fan piedmont are also derived from Pliocene marine formations (i.e., the Yuha Buttes)—as evidenced by reworked fragmentary fossilized marine shell—but are generally well mixed with granitic material. The younger inset fans and fan aprons consist primarily of reworked material from the older fan components. Given the predominance of granitic parent material, one can expect that desert pavements within the project area will be much weaker than in other areas of the Colorado Desert, where more resistant parent material may be present. Nonetheless, comparison of pavement surfaces within the project area should provide a reliable estimate of relative age. Unfortunately, due to heavy Off Highway Vehicle (OHV) use within the project area, some older pavement surfaces have been severely disturbed and may appear younger than the landform actually is.

As such, perhaps a more reliable estimate of landform age within the project area is soil horizon development. Due to the time-transgressive nature of soil development in arid environments, the stage of calcium-carbonate (k) illuviation and development and the degree of B horizon development are identifiable markers of age (McDonald et al. 2003). In this study of the IVS Project area, the degree of desert pavement formation and calcic horizon formation were used in conjunction as indicators of landform age during field studies. In addition, more typical soil classifications were made on exposed profiles in order to assess pedogenic processes at play in the project area.

Master soil horizons were defined using standard United States Department of Agriculture soil taxonomy (Soil Survey Staff 2006). This organizational system uses uppercase letters (A, B, and C) to describe in-place weathering characteristics. Most horizons and layers are given a single capital letter symbol where "A" is the organic-rich upper horizon developed at or near the original ground surface, "B" is the horizon formed in the middle of a profile, with concentrations of illuviated clays, iron, etc., and general changes in soil structure, and "C" is the relatively unweathered parent material upon which the other soil horizons formed.

These master horizons are preceded by Arabic numerals (2, 3, etc.) when the horizon is associated with a different stratum; where number 1 is understood but not shown, and lower numbers indicate superposition over larger numbers. Lowercase letters are used to designate subordinate soil horizons (Table 4, Subordinate Distinctions within Master Soil Horizons). Combinations of these numbers and letters indicate the important characteristics of each major stratum and soil horizon, from which inferences about deposition and pedogenic history can be drawn.

Cultural Resources Table 4
Subordinate Distinctions among Master Soil Horizons

Subordinate Horizon	Description
c	Cementation or induration of the soil matrix
k	Accumulation of pedogenic carbonates, commonly calcium carbonate
ox	Oxidized iron and other minerals in parent material (C-horizon)
t	Accumulation of subsurface silicate clay (illuviation)
v	Vesicular soil development
w	Development of color or structure with little apparent illuvial accumulation

Methods and Results

Major landforms within the project area were initially identified using 1×1 m resolution black-and-white aerial photography. Given these designations, certain broad assumptions could be made about the age and depositional history of each portion of the project area. This mapping and related assumptions were verified and modified in the field, through on-the-ground examination of the landscape and key indicators such as relative slope, desert pavement development, and subsoil formation. The latter was largely examined in soil profiles exposed in active or recent stream channels, smaller erosional side slopes on the fan piedmont, and at least two older unfilled backhoe trenches that were discovered during the course of field investigations. The combined results of this study are summarized in Table 5, Summary of Geoarchaeological Sensitivity of Landforms within the IVS Project Area. The following is a discussion of these results.

Cultural Resources Table 5
Summary of Geoarchaeological Sensitivity of Landforms in the Imperial Valley Solar Project Area

Landform	Age	Depositional Regime*	Sensitivity
Rock Outcrops	Pliocene	Erosional	None
Fan Piedmont (and remnants)	Pleistocene	Erosional	Very Low
Fan Apron/Skirt	Pleistocene to Holocene	Depositional	Low to Moderate
Lake Basin (Beach Zone)	Holocene	Depositional	Moderate
Lake Basin (Lower Lake Basin)	Holocene	Variable	Low to Moderate
Recent/Active Channels	Late Holocene	Erosional	Very Low

*Represents the dominant regime since the terminal Pleistocene

Sediments and Soils in the Project Area

During the Pleistocene, the Salton Trough was periodically inundated by the floodwaters of the Colorado River to form a number of unnamed lakes. Lake Cahuilla was formed in the late Holocene, which was one of the final episodes of sedimentation in the project area. The fine-grained silts and clays of lacustrine origin represent the Borrego and Brawley formations, which are exposed in the northern basin region. Continued deposition of coarser sediments of the Colorado River along the basin margin during the Pleistocene resulted in the Ocotillo Conglomerate Formation. The most recent sediments deposited in the basin, the Holocene Lake Cahuilla Beds, resulted from a series of fresh to brackish water lakes in the Salton Trough. The lakebed deposits consist of tan and gray fossiliferous clay, silt, sand, and some gravel. Young alluvial deposits overlie or interfinger with the Lake Cahuilla Beds around the margins of the ancient lake region that formed the present-day expression of the Ancient Lake Cahuilla shoreline.

Fan Piedmont

The fan piedmont, which makes up the majority of the project area, is actually a complex of component landforms dominated by erosional fan remnants, erosional side slopes and gullies, and inset fans, which themselves have been further eroded and redeposited downslope. In general, the landscape is heavily desiccated. Peterson (1981:22) suggests that the fan piedmont is generally made up of “contiguous or imbricated mantles deposited during the Pleistocene … [and] collectively the portion of the fan surface that they form are all so old that their soils have relict features reflecting past Pleistocene climates.”

The majority of exposed surfaces within this area are very old fan surfaces with moderately well-developed pavement and overthickened calcic subsurface soil development. The subsurface exposures suggest a much older landscape than might be initially assumed from pavement development. The lack of well defined, late-stage interlocking desert pavement, which is often seen in other parts of the Basin and Range, is due to 2 primary factors: parent material and historic land use (see previous discussion). Material for the fan piedmont within the IVS Project area appears to be largely derived from a granitic parent source. The granite is easily weathered and, when exposed on the surface, decomposes to fine grain material, as evidenced by the large amount of decomposing granite that makes up subsurface soils and fills the gullies between interfluves. Extensive OHV use of the project area further degrades these pavements and exposes the surface to further erosion.

The lack of very well-developed pavement on some older surfaces within the project area also has an effect on erosion and subsurface soil development. In some cases, this is the direct result of soil horizons typically found in the upper portions of the profile (e.g., an Av-horizon) having been eroded away. In others, it is simply that the calcic development is so advanced that the typically vesicular Av or BAv horizons have been infilled and incorporated and cemented by calcium carbonate.

The soils and land surfaces observed throughout the fan piedmont suggest an antiquity that precludes any significant buried archaeological deposits that are not at least partially evident on the surface. In general, the dissected fan piedmont consists of very old (Late Pleistocene or older) alluvium mantling uplifted non-marine formations. No buried paleosols were observed in the cuts and profiles examined within the fan piedmont. Soils and pavements developed at or near the surface are consistent with Late Pleistocene or older alluvial deposits dated by other studies in the region (e.g., McDonald et al. 2003; Harvey and Wells 2003).

The greatest—perhaps only—potential for buried archaeological deposits within the fan piedmont exists in the larger Holocene inset fan drainages, where recent fine grain alluvium *may* have been deposited as an inset pediment, prior to scouring of the surface by the actively incising drainage. In general, these inset fan portions are unlikely to contain buried archaeology because they were largely laid down unconformably on eroded Pleistocene deposits. The preservation of archaeological material is wholly dependent on the erosional history prior to deposition of the fine grain pediment. Given the highly erosive nature of the fan piedmont in general, this type of localized subsurface preservation seems unlikely. However, these isolated areas appear to represent the only possibility for preserved subsurface archaeology within the fan piedmont region of the project area. If cultural deposits are present under these isolated inset pediments, they would most likely be very similar, both in quality and quantity of artifacts, to those sites found on the surface in nearby remnant portions of the fan piedmont.

Fan Apron/Skirt

Often termed a fan skirt, this portion of the project area is defined by a broad area at the base of the fan piedmont, where the finer grain material eroded from the fan piedmont is deposited on the basin floor. In this case, the fan skirt actually consists of a number of fan “aprons” that do not individually fully cover the entire area, but interfinger and partially bury one another and the piedmont remnants.

The large fan aprons that dominate the central portion of the project area of analysis enter the basin floor up to 3 kilometers from the Lake Cahuilla high shoreline, and extend up to and, in some places, past that line. Where the aprons appear to extend past the shoreline, we can assume that these aprons were deposited after the last high stand (ca. AD 1700) as they have not been modified by lake actions (either erosional or depositional). Though erosive braided channels make up a portion of each successive fan apron, especially at the head of the aprons as they emerge from the piedmont, a significant portion of each apron also consists of thin alluvial mantles deposited to the side of each channel. Younger apron deposits may cover, or partially cover through the infilling of swales, older apron deposits.

Lake Basin

The lake basin portion of the project area consists of at least two distinct components: (1) the nearly flat lake basin itself (“lower lake basin”), which represents the abandoned Lake Cahuilla basin, and (2) the interface between that basin and the fan apron. The lake basin−fan apron interface consists of the Lake Cahuilla highstand shoreline, and a beach zone associated with that shoreline and its most recent recession.

Beach Zone

The typical undulating landscape of the beach zone near the Lake Cahuilla highstand (12 m above mean sea level [AMSL]) consists of (generally from west to east) beach flats, sand berms and deflated beach sands that are consistent with the multiple formation and recessional events of the maximum Lake Cahuilla shoreline between at least AD 1200 and 1700 (750−250 B.P.; Laylander 2006). Although no buried soils were identified in this portion of the shoreline, the beach zone and the interface with the fan apron is considered the most likely area for site deposition and preservation within the project area. Given the dynamic, but generally low-energy depositional nature of geomorphic processes at the distal fan apron-beach-lake basin interface, the potential for site burial is heightened.

The most recent Lake Cahuilla highstand of 12 m AMSL was dictated by the elevation of natural levees formed by the Colorado River delta, which were over-topped when the lake reached that elevation. It may be reasonable to assume that these delta levees acted as the ultimate control of maximum lake height throughout the Late Pleistocene and Holocene. However, the elevation of the Colorado River delta system has almost certainly changed significantly over the last 20,000 years.

Lower Lake Basin

Very few exposures were available for examination within the low-lying lake basin portion of the project area. The land surface within the lake basin is generally very flat to very gently sloping, with a thin mantle of latest Holocene alluvium and eolian silts overlying lake silts and clays. Vegetation cover in this portion of the project area is slightly denser than adjacent areas, due to the termination of seasonal washes within the basin and the greater water holding capacity of the fine lake sediments.

Conclusions

Based on a combination of aerial imagery, GIS aided analyses, existing data and literature, and intensive field verification, the IVS Project area has been divided into a series of geomorphic landforms. These landforms and their various subcomponents have been assessed for geoarchaeological sensitivity, the results of which are summarized in Tables 4a and 4b.

No evidence of buried cultural material was seen in any of the profiles examined during the field study. The most likely location for preservation of older buried archaeological sites within the project area appears to be within remnant nearshore beach deposits of Lake Cahuilla or under more recent Holocene alluvial deposits at the distal (eastern) end of the fan apron zone. Buried sites within this area are most likely to be younger than Middle Archaic.

Some evidence for preserved buried land surfaces was seen in profiles throughout the fan apron area, between the older erosional fan piedmont and the shoreline. Within these overlapping fan aprons, preservation will most likely be sporadic and areally confined, dependent on minimal erosion and surface scouring through time and low-energy deposition of overlying sediments. Given these factors and the sparse nature of most surface sites identified in the region—dominated by sparse lithic assemblages—identification of buried sites would likely be very difficult. Perhaps the most effective means of identifying potentially buried archaeological components within the fan apron area is through archaeological sites which appear to be isolated on older remnant surfaces and surrounded by younger alluvium. If the sites do not extend onto the younger surfaces, it is possible that they are old enough that they may have been partially buried by the more recent depositional event.

Given the age of land surfaces within the fan piedmont, and no indication of buried soils of appropriate age, the geoarchaeological sensitivity of the approximately western two-thirds of the IVS Project area is considered very low. For both the fan piedmont area and the fan apron area, any potentially buried archaeological deposits are not likely to be significantly different than those exposed on the surface of remnant landforms.

Pedestrian Archaeological Surveys

Discussion of Sequence of Archaeological Surveys

Resources observed and recorded during field studies are first given temporary designations (Table 6 below). At a later date the requisite recordation forms will be submitted to the archaeological information center for permanent number designations.

The initial 100% Class III survey of the proposed project area, identified 337 total cultural resources (Cultural Resources Table 6), of which 232 are prehistoric, 38 are historic, 17 are multi-component, 36 are isolated finds, and 14 are objects. Five built environment sites were also found and assessed.

RE-EVALUATION OF 20 % OF THE PREVIOUSLY RECORDED SITES

LSA Associates, Inc. (LSA) was tasked by the BLM El Centro Field Office to conduct ground-truth visits at 60 randomly selected site locations (approximately 20% of the 337 sites recorded by the consultant for the applicant). Utilizing printed DPR forms and Trimble GPS units with Geographic Information Systems (GIS) digital data with each site's boundaries and internal features, LSA conducted the task of verifying the DPR forms, recorded boundaries, feature locations, and artifact classes.

RE-SURVEY OF 25% OF THE PREVIOUSLY RECORDED SITES

Based on the results of the original 20% site revisit, the BLM and Energy Commission staff tasked the applicant's consultant to implement a further 25% stratified random sample for site re-recordation. As requested by BLM-El Centro and Commission staff, archaeological sites were stratified according to resource character and landform context. The results of the re-recordation effort form the basis of the analysis below of the archaeological resource base.

RE-SURVEY OF REMAINING PREVIOUSLY RECORDED SITES

Contrary to BLM and Energy Commission staff direction, the applicant chose to revisit the balance of 75% of the archaeological sites in the project area of analysis during the months of approximately October and November of 2009. The applicant subsequently produced the third revision to the cultural resources technical report which incorporated the latest data for 100% of the archaeological resource inventory (SES 2009z). That third revision underwent extensive review and comment during the first half of 2010 and the fourth revision came out in late June 2010. The late date of the fourth revision's release and ongoing deliberations between the Energy Commission and the BLM over the management of confidential cultural resources data (Energy Commission Docket No. 10-CRD-1) have precluded Energy Commission staff use of that data in the present SSA.

Results of Pedestrian Survey – Project Area

Resources listed and described are previously unrecorded. The original Class III survey of the proposed project area identified 337 total cultural resources, of which 232 are prehistoric, 38 are historic, 17 are multi-component, 36 are isolated finds, and 14 are objects. Five built environment sites were also found and assessed.

CULTURAL RESOURCES TABLE 6
Initial Cultural Resources Inventory for the Project Area of Analysis
(SES 2008c, SES 2008e) (100**%** of archaeological resources)

Temporary Site No.	Site Type	Cultural Context	Potential for Buried Deposits Based on Geomorphologic Information	Project Area Location
DRK-001	Open Camp	Prehistoric	Medium to high	450-MW Area Phase II
DRK-009	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
DRK-012	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
DRK-013	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
DRK-015	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
DRK-016	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
DRK-017	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
DRK-019	Ceramic Scatter	Prehistoric	Low	300-MW Area Phase I
DRK-021	Object-Historic Survey Marker	Historic	Low	300-MW Area Phase I
DRK-022	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I

Temporary Site No.	Site Type	Cultural Context	Potential for Buried Deposits Based on Geomorphologic Information	Project Area Location
DRK-024	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
DRK-025	Lithic Scatter	Prehistoric	Low	450-MW Area Phase II
DRK-026	Cairn	Prehistoric	Low	450-MW Area Phase II
DRK-028	Lithic Scatter	Prehistoric	Low	450-MW Area Phase II
DRK-030	Historic Refuse Deposits	Historic	Low	450-MW Area Phase II
DRK-031	Lithic Scatter	Prehistoric	Low	450-MW Area Phase II
DRK-033	Historic survey marker	Historic	Low	450-MW Area Phase II
DRK-034	Lithic Scatter	Prehistoric	Low	750-MW Substation
DRK-035	Lithic Scatter	Prehistoric	Low	750-MW Substation
DRK-036	Historic survey marker	Historic	Low	Access Road 100 ft Corridor
DRK-037	Lithic Scatter	Prehistoric	Low	450-MW Area Phase II
DRK-039-I	Isolate	Prehistoric	Low	450-MW Area Phase II
DRK-041	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
DRK-042	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
DRK-043	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
DRK-044	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
DRK-045	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
DRK-046	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
DRK-048	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
DRK-049	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
DRK-050	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
DRK-051	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
DRK-052	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
DRK-143	Lithic and ceramic scatter with groundstone	Prehistoric	Medium to high	Laydown Staging Area
DRK-144	Lithic Scatter	Prehistoric	Medium to high	Laydown Staging Area
DRK-147	Multi component	Historic and Prehistoric	Medium to high	Laydown Staging Area
DRK-148	Multi component, historic refuse deposit and open camp	Historic and Prehistoric	Medium to high	Laydown Area
DRK-149	Historic refuse deposit	Historic	Medium to high	Laydown Area

Temporary Site No.	Site Type	Cultural Context	Potential for Buried Deposits Based on Geomorphologic Information	Project Area Location
DRK-150	Multi component, Historic refuse deposit and Prehistoric open camp	Historic and Prehistoric	Medium to high	Laydown Area
DRK-188	Lithic scatter with single ceramic sherd	Prehistoric	Medium to high	Laydown Area
EBR-001	Lithic Scatter	Prehistoric	Medium to high	450-MW Area Phase II
EBR-002	Lithic Scatter	Prehistoric	Medium to high	450-MW Area Phase II
EBR-003	Lithic Scatter	Prehistoric	Medium to high	450-MW Area Phase II
EBR-004-I	Isolate	Prehistoric	Low	450-MW Area Phase II
EBR-005	Cairn	Unknown	Low	450-MW Area Phase II
EBR-006-I	Isolate	Prehistoric	Low	450-MW Area Phase II
EBR-009-I	Isolate	Prehistoric	Low	300-MW Area Phase I
EBR-011-I	Isolate	Prehistoric	Low	300-MW Area Phase I
EBR-015	Historic Refuse Deposit	Historic	Medium to high	Access Road 100 ft Corridor
EBR-016	Historic Refuse Deposit	Historic	Medium to high	Access Road 100 ft Corridor
EBR-019	Open Camp with 13 cremations	Prehistoric	Medium to high	Water Supply Line 100 ft Corridor
EBR-021	Lithic scatter – quartz smash	Prehistoric	Low	300-MW Area Phase I
EBR-022	Lithic scatter and cairns	Prehistoric	Low	300-MW Area Phase I
EBR-025	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
EBR-026	Lithic and ceramic scatter	Prehistoric	Low	300-MW Area Phase I
EBR-061	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
EBR-062	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
EBR-063-I	Isolate	Prehistoric	Medium to high	300-MW Area Phase I
EBR-064	Lithic Scatter	Prehistoric	Low	300-MW Area Phase I
EBR-066	Lithic Scatter	Prehistoric	Low	450-MW Area Phase II
EBR-067-I	Isolate	Prehistoric	Low	450-MW Area Phase II
EBR-068	Lithic Scatter	Prehistoric	Low	
EBR-069	Historic refuse deposit	Historic	Low	450-MW Area Phase II
EBR-071-I	Isolate	Prehistoric	Low	Transmission Line 300 ft Corridor
EBR-073	Lithic Scatter	Prehistoric	Low	450-MW Area Phase II
EBR-077	Lithic and ceramic scatter	Prehistoric	Low	450-MW Area Phase II

Temporary Site No.	Site Type	Cultural Context	Potential for Buried Deposits Based on Geomorphologic Information	Project Area Location
EBR-078-I	Isolate	Prehistoric	Low	450-MW Area Phase II
EBR-081	Lithic Scatter	Prehistoric	Low	Access Road 100 ft Corridor
EBR-082-I	Isolate	Prehistoric	Low	450-MW Area Phase II
EBR-084	Lithic scatter	Prehistoric	Low	Transmission Line 300 ft Corridor
EBR-085	Ceramics scatter	Prehistoric	Low	450-MW Area Phase II
EBR-086	Historic refuse deposit	Historic	Low	450-MW Area Phase II
EBR-087	Historic refuse deposit with one prehistoric artifact	Historic	Low	Transmission Line 300 ft Corridor
EBR-090-I	Isolate Historic glass insulator	Historic	Low	Transmission Line 300 ft Corridor
EBR-093	Lithic and ceramic scatter	Prehistoric	Medium	450-MW Area Phase II
EBR-097	Lithic and ceramic scatter	Prehistoric	Low	450-MW Area Phase II
EBR-098	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
EBR-099	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
EBR-101	Lithic scatter	Prehistoric	Medium	Waterline 100 ft Corridor
EBR-103	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
EBR-104	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
EBR-105-I	Isolate	Prehistoric	Low	450-MW Area Phase II
EBR-107	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
EBR-108	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
EBR-109	Multi component site, prehistoric lithic scatter with historic refuse deposit	Historic and Prehistoric	Low to Medium	Transmission Line 300 ft Corridor
EBR-201-I	Isolate	Prehistoric	Low	450-MW Area Phase II
EBR-202	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
EBR-203-I	Isolate	Prehistoric	Low	450-MW Area Phase II
EBR-204	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
EBR-205	Lithic scatter with sleeping circle	Prehistoric	Medium	450-MW Area Phase II
EBR-207	Historic refuse deposit	Historic	Medium to high	Access Road 100 ft Corridor
EBR-213	Lithic and ceramic scatter	Prehistoric	Medium to high	450-MW Area Phase II
EBR-219	Ceramic scatter	Prehistoric	Medium	Access Road 100 ft Corridor

Temporary Site No.	Site Type	Cultural Context	Potential for Buried Deposits Based on Geomorphologic Information	Project Area Location
EBR-220	Lithic scatter	Prehistoric	Medium to high	Access Road 100 ft Corridor
EBR-223	Historic refuse deposit	Historic	Medium	450-MW Area Phase II
EBR-300	Lithic and ceramic scatter	Prehistoric	Medium	450-MW Area Phase II
EBR-303	Lithic and ceramic scatter	Prehistoric	Medium to high	Waterline 150 ft Corridor
EBR-304	Lithic and ceramic scatter	Prehistoric	Medium to high	Water Supply Line 100 ft Corridor
EBR-305	Ceramics scatter with a hearth	Prehistoric	Medium to high	Water Supply Line 100 ft Corridor
EBR-C	Open camp with 2 cremations	Prehistoric	Medium to high	Project Boundary 200 ft Buffer
HR-02	Historic Road	Historic	Low	½ in 450 MW Area Phase II, ½ Outside of project area
HR-03	Historic Road	Historic	Low	450-MW Area Phase II
HR-04	Historic Road	Historic	Low	½ in 450 MW Area Phase II, ½ Outside of project area
HR-05	Historic Road	Historic	Low	¼ in 450 MW Area Phase II, ¾ Outside of project area
JF-001	Lithic scatter	Prehistoric	Low	Access Road 100 ft Corridor
JF-001-I	Isolate	Prehistoric	Low	300-MW Area Phase I
JF-002	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
JF-003	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
JF-003A	Cairn	Prehistoric	Low	300-MW Area Phase I
JF-004	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
JF-007	Historic refuse deposit	Historic	Low	300-MW Area Phase I
JF-008	Historic refuse deposit	Historic	Low	Access Road 100 ft Corridor
JF-015	Historic survey marker	Historic	Low	Waterline 150 ft Corridor
JF-017-I	Isolate	Prehistoric	Low	450-MW Area Phase II
JF-018	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
JF-019	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
JF-026	Open Camp	Prehistoric	Medium	Water Supply Line 100 ft Corridor
JF-031	Historic refuse deposit	Historic	Medium to high	Laydown Staging Area

Temporary Site No.	Site Type	Cultural Context	Potential for Buried Deposits Based on Geomorphologic Information	Project Area Location
JF-042	Prayer circle	Prehistoric	Low	450-MW Area Phase II
JF-043	Historic refuse deposit	Historic	Medium	450-MW Area Phase II
JFB-002	Geoglyph	Prehistoric	Low	300-MW Area Phase I
JFB-006	Geoglyph	Prehistoric	Low	300-MW Area Phase I
JFB-009	Geoglyph	Prehistoric	Low	300-MW Area Phase I
JFB-009A	Historic survey marker	Historic	Low	300-MW Area Phase I
JFB-011	Historic refuse deposit	Historic	Low	Project Boundary 200 ft Buffer
JFB-012	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
JM-002	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
JM-003	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
JM-004	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
JM-006	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
JM-007	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
JM-011	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
JM-012	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
JM-016	Lithic scatter	Prehistoric	Low	Water Supply Line 100 ft Corridor
JM-017	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
JM-021	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
JM-023	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
JM-024	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
JM-027	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
JM-028	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
JM-032	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
JM-033	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
JM-035	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
JM-036	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
JM-037	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
JM-038	Lithic scatter	Prehistoric	Low	Access Road 100 ft Corridor
JM-039	Lithic scatter	Prehistoric	Low	Access Road 100 ft Corridor
JM-041	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
JM-043	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
JMK-010	Lithic and ceramic scatter	Prehistoric	Medium to high	Water Supply Line 100 ft Corridor
JMR-005	Multi-component	Prehistoric/ Historic	Low	450-MW Area Phase II

Temporary Site No.	Site Type	Cultural Context	Potential for Buried Deposits Based on Geomorphologic Information	Project Area Location
JMR-006	Historic cairn and refuse deposit	Prehistoric	Low	450-MW Area Phase II
JMR-007-I	Isolate	Prehistoric	Low	450-MW Area Phase II
JMR-009	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
JMR-010-I		Prehistoric	Low	450-MW Area Phase II
JMR-011	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
JMR-013	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
JMR-014	Lithic scatter	Prehistoric	Medium to high	450-MW Area Phase II
JMR-015-I		Prehistoric	Low	Access Road 100 ft Corridor
JMR-016	Aerial photo marker	Historic	Low	450-MW Area Phase II
JMR-018	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
JMR-021	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
JMR-023-I		Prehistoric	Low	Waterline 150 ft Corridor
JMR-025	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
KRM-001	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
LL-002A	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
LL-003A	Hearth	Prehistoric	Medium	450-MW Area Phase II
LL-020	Lithic scatter	Prehistoric	Medium to high	450-MW Area Phase II
LL-022	Lithic and ceramic scatter	Prehistoric	Medium to high	450-MW Area Phase II
LL-022A	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
LL-023-I		Prehistoric		450-MW Area Phase II
LL-024	Lithic scatter with hearth	Prehistoric	Medium to high	450-MW Area Phase II
LL-026	Lithic scatter	Prehistoric	Medium to high	450-MW Area Phase II
LL-029-I	Mano	Prehistoric	Low	Project Boundary 200 ft Buffer
RAN-001	Historic survey marker	Historic	Low	300-MW Area Phase I
RAN-002	Lithic scatter	Prehistoric	Low	300-MW Area Phase I
RAN-003-I		Prehistoric	Low	450-MW Area Phase II
RAN-004	Multi-component	Historic and Prehistoric	Low	300-MW Area Phase I
RAN-007	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
RAN-009	Historic refuse deposit	Historic	Low	450-MW Area Phase II
RAN-010	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
RAN-011	Lithic scatter	Prehistoric	Low	450-MW Area Phase II

Temporary Site No.	Site Type	Cultural Context	Potential for Buried Deposits Based on Geomorphologic Information	Project Area Location
RAN-013	Historic refuse deposit	Historic	Low	450-MW Area Phase II
RAN-014	Historic refuse deposit	Historic	Low	Access Road 100 ft Corridor
RAN-016	Historic survey marker	Historic	Medium to high	Waterline 150 ft Corridor
RAN-017	Multi component	Historic and Prehistoric	Medium to high	450-MW Area Phase II
RAN-019	Historic refuse deposit	Historic	Low	450-MW Area Phase II
RAN-020	Historic refuse deposit	Historic	Low	Access Road 100 ft Corridor
RAN-021	Lithic scatter	Prehistoric	Low	300-MW Area Phase I
RAN-023	Historic refuse deposit	Historic	Low	300-MW Area Phase I
RAN-024	Lithic scatter	Prehistoric	Low	300-MW Area Phase I
RAN-026	Lithic scatter	Prehistoric	Low	300-MW Area Phase I
RAN-027	Historic refuse deposit	Historic	Low	300-MW Area Phase I
RAN-028	Lithic scatter	Prehistoric	Medium to high	Project Boundary 200 ft Buffer
RAN-029	Lithic scatter	Prehistoric	Low	Project Boundary 200 ft Buffer
RAN-030	Lithic scatter	Prehistoric	Low	750-MW Substation
RAN-035	Historic refuse deposit	Historic	Low	450-MW Area Phase II
RAN-036	Multi-component	Historic and Prehistoric	Low	300-MW Area Phase I
RAN-045-I		Prehistoric	Low	Transmission Line 300 ft Corridor
RAN-046	Historic refuse deposit	Historic	Medium to high	Waterline 150 ft Corridor
RAN-047-I		Prehistoric	Low	Waterline 150 ft Corridor
RAN-048	Lithic scatter	Prehistoric	Medium to high	Water Supply Line 100 ft Corridor
RAN-049	Historic refuse deposit	Historic	Medium to high	Waterline 150 ft Corridor
RAN-050	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
RAN-051	Lithic scatter	Prehistoric	Medium	Project Boundary 200 ft Buffer
RAN-052	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
RAN-053	Lithic scatter	Prehistoric	Medium to high	450-MW Area Phase II

Temporary Site No.	Site Type	Cultural Context	Potential for Buried Deposits Based on Geomorphologic Information	Project Area Location
RAN-054	Lithic scatter	Prehistoric	Medium to high	450-MW Area Phase II
RAN-055	Lithic scatter	Prehistoric	Medium to high	450-MW Area Phase II
RAN-058	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
RAN-060-I			Low	450-MW Area Phase II
RAN-062-I			Low	450-MW Area Phase II
RAN-063	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
RAN-064	Cairn		Low	450-MW Area Phase II
RAN-065	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
RAN-066	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
RAN-067	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
RAN-068	Lithic scatter, quartz smash	Prehistoric	Low	450-MW Area Phase II
RAN-069	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
RAN-071-I			Low	450-MW Area Phase II
RAN-072	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
RAN-073	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
RAN-074	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
RAN-075-I			Low	450-MW Area Phase II
RAN-078-I			Low	450-MW Area Phase II
RAN-080	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
RAN-084	Lithic scatter	Prehistoric	Medium	Project Boundary 200 ft Buffer
RAN-089-I			Low	Project Boundary 200 ft Buffer
RAN-092	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
RAN-093-I			Low	450-MW Area Phase II
RAN-095	Lithic scatter	Prehistoric	Medium	450-MW Area Phase II
RAN-409-I			Low	Transmission Line 300 ft Corridor
RAN-410-I			Low	Transmission Line 300 ft Corridor
RAN-411-I			Low	Transmission Line 300 ft Corridor
RAN-413	Lithic scatter	Prehistoric	Medium to high	Transmission Line 300 ft Corridor
RAN-416	Lithic scatter	Prehistoric	Low	Transmission Line 300 ft Corridor
RAN-417	Lithic scatter	Prehistoric	Medium to high	Transmission Line 300 ft Corridor
RAN-418	Lithic and ceramic scatter	Prehistoric	Medium to high	Transmission Line 300 ft Corridor

Temporary Site No.	Site Type	Cultural Context	Potential for Buried Deposits Based on Geomorphologic Information	Project Area Location
RAN-419	Lithic and ceramic scatter	Prehistoric	Medium to high	Transmission Line 300 ft Corridor
RAN-420	Lithic and ceramic scatter	Prehistoric	Medium to high	Transmission Line 300 ft Corridor
RAN-425-I			Low	Transmission Line 300 ft Corridor
RAN-428	Lithic and ceramic scatter	Prehistoric	Medium to high	Transmission Line 300 ft Corridor
RAN-430	Lithic scatter	Prehistoric	Medium to high	Transmission Line 300 ft Corridor
RAN-431	Lithic scatter	Prehistoric	Medium to high	Transmission Line 300 ft Corridor
RAN-433	Multi-component	Historic and Prehistoric	Low	Transmission Line 300 ft Corridor
RAN-434	Lithic scatter	Prehistoric	Low	Transmission Line 300 ft Corridor
RANA-004	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
SM-001	Lithic scatter	Prehistoric	Low	300-MW Area Phase I
SM-002	Lithic scatter	Prehistoric	Low	300-MW Area Phase I
SM-004	Lithic scatter	Prehistoric	Low	300-MW Area Phase I
SM-005	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
SM-006	Lithic scatter	Prehistoric	Low	450-MW Area Phase II
T-06	Prehistoric Trail	Prehistoric	Low	Linear Resource
T-18	Prehistoric Trail	Prehistoric	Low	300-MW Area Phase I
T-21	Prehistoric Trail	Prehistoric	Low	300-MW Area Phase I
T-43	Prehistoric Trail	Prehistoric	Low	300-MW Area Phase I

Discussion of Results of Archaeological Surveys

The environment and soils in the western section of the project area differ from those in the eastern section. The two sections are approximately delineated by the existing transmission line. In the western portion, the ground surface is covered by developing and well developed desert pavement. This area has been affected by aeolian erosion forces and appears to have a low potential for buried deposits. The eastern portion contains unconsolidated sedimentary clay and silt with colluvial inclusions. This area appears to have a potential for subsurface cultural deposits, which is typical of an area of actively shifting soils.

Coincident with the environmental variations across the project area, a change in site types was also observed. In the western portion of the project area, site types consist of lithic reduction sites composed of local materials exhibiting basic flake and cobble technology. Unless otherwise noted, the lithic scatters did not include temporally diagnostic artifacts or features. These sites lacked features and diagnostic artifacts and ceramics were sparse. The western portion of the project area contained prehistoric trails and circular areas that had been cleared of the desert pavement.

While the field survey for cultural resources continues, the results from the record search and earlier stages of the field survey that are summarized here clearly demonstrate the quantity, quality, and density of the cultural resources in the project area. It is certain that some of these cultural resources will be determined to be significant and to be eligible for nomination to the NRHP.

Cultural Resources Table 7
Cultural Resources Inventory for the Project Area of Analysis
(SES 2009x)
(25% sample of archaeological resources,
and 100% of built-environment resources and known ethnographic resources)

Cultural Resource Classification and Designation(s)	Resource Type	Description[1]	Project Area Location	Landform Context[2]
Archaeological Resources ***Prehistoric Archaeological Resources***				
Proposed Southwest Lake Cahuilla Shoreline Archaeological District	Prehistoric archaeological district		Phase II 450 MW Solar Field	Lake Basin, Beach Zone, Fan Aprons, Fan Piedmont
Yuha Basin Discontiguous District	Prehistoric archaeological district		Outside project area (E of Phase I 300 MW Solar Field, S of Phase II 450 MW Solar Field)	Fan Piedmont, Active/Recent Wash
DRK-002	Sparse chipped stone deposit	15 flakes,[3] 2 cores, hammerstone	Phase I 300 MW Solar Field	Fan Piedmont
DRK-005	Sparse chipped stone deposit	93 flakes, 4 cores	Phase I 300 MW Solar Field	Fan Piedmont
DRK-011	Sparse chipped stone deposit	176 flakes, 6 hammerstones, 5 cores, tested cobble	Phase I 300 MW Solar Field	Fan Piedmont
DRK-047	Sparse chipped and ground stone deposit	40 flakes, 2 tested cobbles, core, mano	Phase I 300 MW Solar Field	Fan Piedmont
EBR-010A	Ceramic deposit	10 ceramic sherds	Phase I 300 MW Solar Field	Fan Piedmont
EBR-020	Chipped stone deposit	34 flakes, 2 fragmentary tested cobbles, hammerstone	Phase I 300 MW Solar Field	Fan Piedmont

Cultural Resource Classification and Designation(s)	Resource Type	Description[1]	Project Area Location	Landform Context[2]
EBR-023	Sparse chipped stone deposit	18 flakes, core	Phase I 300 MW Solar Field	Fan Piedmont
EBR-065	Sparse chipped and ground stone deposit	53 flakes, 3 hammerstones, 2 cores, edge-modified flake, mano	Phase I 300 MW Solar Field	Fan Piedmont
RAN-025	Sparse chipped stone deposit	3 tested cobbles, 3 hammerstones, flake	Phase I 300 MW Solar Field	Fan Piedmont
SM-003	Sparse chipped stone deposit	150 flakes, 4 cores, 4 hammerstones, tested cobble	Phase I 300 MW Solar Field	Fan Piedmont
T-17	Trail segment	159 m long, 50-60 cm wide, < 5 cm deep, cobble free	Phase I 300 MW Solar Field	Fan Piedmont
T-42	Trail segment	839 m long, 3 subsegments, 40-50 cm wide, cobble free	Phase I 300 MW Solar Field	Fan Piedmont
DRK-027	Sparse chipped and ground stone deposit	290 flakes, 8 cores, 8 hammerstones, tested cobble, edge-modified flake, biface, mano	Phase II 450 MW Solar Field	Fan Piedmont
DRK-029	Sparse chipped stone deposit	7 flakes, hammerstone, core, tested cobble	Phase II 450 MW Solar Field	Fan Piedmont
DRK-032	Chipped stone deposit	106 flakes, 2 cores, hammerstone, tested cobble	Phase II 450 MW Solar Field	Fan Piedmont

Cultural Resource Classification and Designation(s)	Resource Type	Description[1]	Project Area Location	Landform Context[2]
EBR-019 [Element of Proposed Southwest Lake Cahuilla Shoreline Archaeological District, above]	FAR4 concentrations, human cremations, sparse ceramic and chipped and ground stone deposit	8,676 ceramic sherds, 4,969 flakes, 994 FARs, 378 cores, 304 chipped stone tools, 231 calcined human bone fragments, 42 unidentified bone fragments, 27 ground stone tools, 15 projectile points, 9 *Olivella* spp. shell beads	Phase II 450 MW Solar Field	Fan Aprons
EBR-070	Sparse chipped stone deposit	72 flakes, 3 hammerstones, 2 cores, bifacial core tool, unifacial core tool	Phase II 450 MW Solar Field	Fan Piedmont
EBR-072	Sparse chipped stone deposit	5 flakes	Phase II 450 MW Solar Field	Fan Piedmont
EBR-079	Sparse chipped stone and angular quartz deposit	53 flakes, 30 pieces of angular quartz shatter, 2 cores, 2 hammerstones, bifacial core tool	Phase II 450 MW Solar Field	Fan Piedmont
EBR-080	Sparse chipped stone deposit	2 flakes, core	Phase II 450 MW Solar Field	Fan Piedmont
EBR-095	Sparse chipped stone deposit	44 flakes, 3 cores, 3 tested cobbles, edge-modified flake	Phase II 450 MW Solar Field	Fan Aprons
EBR-096	Chipped stone deposit	35 flakes	Phase II 450 MW Solar Field	Fan Aprons
EBR-100	Chipped stone deposit	29 flakes, hammerstone, core	Phase II 450 MW Solar Field	Fan Aprons
EBR-102	Sparse chipped stone deposit	85 flakes, 7 cores, 3 tested cobbles, edge-modified flake	Phase II 450 MW Solar Field	Fan Aprons
EBR-106	Chipped stone deposit	8 flakes	Phase II 450 MW Solar Field	Fan Aprons

Cultural Resource Classification and Designation(s)	Resource Type	Description[1]	Project Area Location	Landform Context[2]
EBR-222 [Potential element of Proposed Southwest Lake Cahuilla Shoreline Archaeological District, above]	FAR concentration, sparse chipped stone and ceramic deposit	50 FARs, 4 ceramic sherds, flake, tested cobble	Phase II 450 MW Solar Field	Fan Aprons
JF-005	Sparse chipped stone deposit	71 flakes, 2 hammerstones, core	Phase II 450 MW Solar Field	Fan Piedmont
CA-IMP-3752, -3753, -8731 (JM-001) [Potential element of Proposed Southwest Lake Cahuilla Shoreline Archaeological District above]	Sparse chipped stone and ceramic deposit	20 flakes, 2 ceramic sherds, hammerstone, core	Phase II 450 MW Solar Field	Fan Aprons
JM-005	Sparse chipped and ground stone deposit	8 flakes, 2 cores, mano	Phase II 450 MW Solar Field	Fan Aprons
JM-008	Sparse chipped stone deposit	9 flakes	Phase II 450 MW Solar Field	Fan Aprons
CA-IMP-2083 (JM-009)	Sparse chipped stone deposit	49 flakes, core, tested cobble	Phase II 450 MW Solar Field	Fan Aprons
JM-020	Sparse chipped stone deposit	93 flakes, 2 cores, hammerstone, tested cobble	Phase II 450 MW Solar Field	Fan Aprons
JM-029	Sparse chipped stone deposit	22 flakes, 3 cores, 3 hammerstones	Phase II 450 MW Solar Field	Fan Piedmont Remnant
JM-030	Chipped stone deposit	26 flakes, core	Phase II 450 MW Solar Field	Fan Piedmont Remnant
JM-042	Sparse chipped stone deposit	192 flakes, 5 hammerstones, 2 cores, tested cobble	Phase II 450 MW Solar Field	Fan Piedmont
JMR-004	FAR concentration, isolate chipped stone artifact	40 FARs, core	Phase II 450 MW Solar Field	Fan Piedmont
JMR-008	Sparse chipped stone deposit	14 flakes, 2 cores	Phase II 450 MW Solar Field	Fan Piedmont Remnant
JMR-012	Sparse chipped stone deposit	41 flakes, unifacial edge-modified flake	Phase II 450 MW Solar Field	Fan Piedmont Remnant
LL-018	Sparse chipped stone deposit	23 flakes, 2 cores, “scraper”	Phase II 450 MW Solar Field	Fan Aprons, Active/Recent Wash

Cultural Resource Classification and Designation(s)	Resource Type	Description[1]	Project Area Location	Landform Context[2]
LL-019 [Potential element of Proposed Southwest Lake Cahuilla Shoreline Archaeological District, above]	"Angular rock" concentrations, sparse chipped stone deposit	182 flakes, 100 "angular rocks," 14 cores, 3 tested cobbles, hammerstone	Phase II 450 MW Solar Field	Fan Piedmont Remnant
RAN-057 [Potential element of Proposed Southwest Lake Cahuilla Shoreline Archaeological District, above]	Sparse chipped stone and ceramic deposit	20 ceramic sherds, 3 flakes, core	Phase II 450 MW Solar Field	Fan Aprons
RAN-061	Sparse chipped stone deposit	314 flakes, 15 cores, 5 hammerstones, stone anvil	Phase II 450 MW Solar Field	Fan Piedmont Remnant
RAN-081	Sparse chipped stone deposit	605 flakes, 29 cores, 11 tested cobbles, 3 hammerstones	Phase II 450 MW Solar Field	Fan Piedmont Remnant
T-03	Trail segment	438 m long, 3 subsegments, 40 cm wide, cobble free	Phase II 450 MW Solar Field	Fan Aprons
T-52	Trail segment	660 m long, 0.4-1.0 m wide, < 5 cm deep, cobble free	Phase II 450 MW Solar Field	Fan Aprons
DRK-139	Sparse chipped stone deposit	92 flakes, 13 cores, 13 tested cobbles, 8 hammerstones	Laydown Area	Lake Basin
DRK-140	Sparse chipped stone deposit	19 flakes, combination core and hammerstone, edge-modified flake	Laydown Area	Lake Basin
DRK-141	FAR concentration, sparse chipped stone deposit	40 FARs, 19 flakes, 2 cores, edge-modified flake	Laydown Area	Lake Basin

Cultural Resource Classification and Designation(s)	Resource Type	Description[1]	Project Area Location	Landform Context[2]
EBR-218 [Potential element of Proposed Southwest Lake Cahuilla Shoreline Archaeological District, above]	Sparse chipped and ground stone and ceramic deposit, isolate historic artifact	31 flakes, 24 ceramic sherds, 2 hammerstones, biface, "core tool," metate fragment, core, historic lard bucket	200-Foot Buffer	Fan Aprons, (Fan Piedmont)
RAN-024	Sparse chipped stone deposit	12 flakes, 3 hammerstones, core, tested cobble	200-Foot Buffer	Fan Piedmont
RAN-412C [Potential element of Proposed Southwest Lake Cahuilla Shoreline Archaeological District, above]	Ceramic and chipped stone deposit	301 ceramic sherds, 94 flakes, 10 cores, 6 tested cobbles, 5 utilized flakes, 1 FAR	Transmission Line	Lake Basin
CA-IMP-8745 (RAN-412F) [Potential element of Proposed Southwest Lake Cahuilla Shoreline Archaeological District, above]	Sparse chipped and ground stone and ceramic deposit	63 ceramic sherds (41 = 1 vessel), 51 flakes, 6 tested cobbles, 3 cores, 3 bifacial core tools, 2 hammerstones, edge-modified flake, "unifacial and bifacial core tool," metate, mano	Transmission Line	Lake Basin
CA-IMP-4345 (RAN-419)	FAR concentration, sparse chipped stone deposit	37 flakes, 10 FARs, 7 cores, 2 hammerstones, 2 tested cobbles, "bi-directional core tool," "quartzite cobble"	Transmission Line	Lake Basin
CA-IMP-4348 (RAN-424) [Potential element of Proposed Southwest Lake Cahuilla Shoreline Archaeological District, above]	FAR concentrations, sparse chipped and ground stone and ceramic deposit, and sandstone source	1,596 flakes, 333 FARs, 269 ceramic sherds, 57 cores, 24, tested cobbles, 23 "core tools," 22 hammerstones, 13 edge-modified flakes, 3 metates, 2 manos, 2 bifaces, pestle	Transmission Line	(Fan Piedmont), Fan Aprons, (Beach Zone)

Cultural Resource Classification and Designation(s)	Resource Type	Description[1]	Project Area Location	Landform Context[2]
RAN-426	Sparse chipped stone deposit	28 flakes, 3 cores, edge-modified flake, tested cobble	Transmission Line	Lake Basin
Historical Archaeological Resources				
Proposed Early Twentieth Century Gravel Mining Landscape	Gravel mining area	Remnants of work camps and work areas, excavation pits, areas of scarified land surfaces	Phase I 300 MW Solar Field,	Fan Piedmont
Juan Bautista de Anza National Historic Trail	Spanish colonial era trail corridor			
DRK-020	Land surveying monument	Bronze survey monument cap, ammunition cartridge	Phase I 300 MW Solar Field	Fan Piedmont
JF-006	Rock concentrations, historic refuse	3 rock concentrations, 2 church-key opened beverage cans, metal socket wrench	Phase I 300 MW Solar Field	Fan Piedmont
RANA-003	Ordinance crater	Ordinance crater, 30 shrapnel fragments	Phase I 300 MW Solar Field	Fan Piedmont
EBR-092	Historic refuse deposit (ca. 1890–1920), rock cairns	Aqua and purple bottle glass, 4 whole and partial pre-sanitary can forms, large cut nail, bolt	Phase II 450 MW Solar Field	Fan Piedmont
RAN-005	Land surveying monument	Brass survey monument cap on metal pipe, bailing wire, wooden lathe fragments, tobacco tin	Phase II 450 MW Solar Field	Fan Piedmont
RAN-006	Historic refuse deposit (ca. mid-1950s)	113 historic artifacts	Phase II 450 MW Solar Field	Fan Piedmont
RAN-008	Land surveying monument	Brass survey monument cap on metal pipe	Phase II 450 MW Solar Field	Fan Piedmont
RAN-015	Historic refuse deposit (ca. 1940s–1950s)	170 historic artifacts	Phase II 450 MW Solar Field	Fan Piedmont

Cultural Resource Classification and Designation(s)	Resource Type	Description[1]	Project Area Location	Landform Context[2]
RAN-018	Aerial land surveying monument	Fragmentary wooden lathes, wire nails, white plastic material	Phase II 450 MW Solar Field	Fan Aprons
DRK-146	Historic refuse deposit (ca. late 1930s–1950s)	600 historic artifacts	Laydown Area	Lake Basin
JF-030	Historic refuse deposit (ca. 1940s–1960s), prehistoric isolate artifact	311 historic to modern artifacts, flake	Laydown Area	Lake Basin
EBR-083	Pebble and cobble concentration	18 pebbles and cobbles	200-Foot Buffer	Fan Piedmont
JFB-004	Land surveying monument	Brass survey monument cap, bailing wire fragments, wooden lathe fragments, small (3–4 rocks) rock cairns	200-Foot Buffer	Fan Piedmont
Multiple Component Archaeological Resources				
RAN-022 [Element of proposed Early Twentieth Century Gravel Mining Landscape, above]	Historic structural ruins, historic FAR concentrations, historic refuse deposit (ca. 1900-1920), Sparse prehistoric chipped stone deposit	2,390 historic artifacts, 1,300 flakes[5], 9 cores, edge-modified flake, edge-modified dark olive green glass bottle sherd	Phase I 300 MW Solar Field	Fan Piedmont
DRK-004	Sparse prehistoric chipped stone deposit, land surveying monument	30 flakes, 3 hammerstones, core, tested cobble, brass survey monument cap and rock cairn	Phase I 300 MW Solar Field	Fan Piedmont

Cultural Resource Classification and Designation(s)	Resource Type	Description[1]	Project Area Location	Landform Context[2]
DRK-010	Sparse prehistoric chipped stone deposit, land surveying monument, rock cairns	176 flakes, 12 cores, 5 tested cobbles, 6 hammerstones, brass survey monument cap, 4 rock cairns, 2 tobacco tins, 3 bailing wire fragments	Phase I 300 MW Solar Field	Fan Piedmont
JFB-010	Sparse prehistoric chipped stone deposit, land surveying monument	6 flakes, hammerstone, brass survey monument cap	Phase I 300 MW Solar Field	Fan Piedmont
DRK-023	Sparse prehistoric chipped stone deposit, rock cairns	58 flakes, 3 cores, 2 rock cairns	Phase II 450 MW Solar Field	Fan Piedmont
JM-026 [Potential element of Proposed Southwest Lake Cahuilla Shoreline Archaeological District above]	FAR and cobble concentrations, sparse chipped stone deposit, historic refuse deposits	2 FAR concentrations, cobble concentration, 1,201 flakes, 51 tested cobbles, 38 cores, 10 hammerstones, 7 bifaces, 6 edge-modified flakes, 3 “choppers,” 3 “core tools,” wonderstone, 3 historic refuse concentrations (ca. late 1950s to early 1960s)	Phase II 450 MW Solar Field	Fan Aprons
RAN-012 [Historic component potential element of Proposed Early Twentieth Century Gravel Mining Landscape, below]	Sparse chipped stone and ceramic deposit, pebble and cobble concentrations, historic to modern refuse	194 flakes, 21 cores, 9 tested cobbles, 5 ceramic sherds, 7 historic to modern artifacts	Phase II 450 MW Solar Field	Fan Piedmont

Cultural Resource Classification and Designation(s)	Resource Type	Description[1]	Project Area Location	Landform Context[2]
RAN-034 [Potential Depression-era work camp adjacent to apparent gravel mining pits] [Historic component potential element of proposed Early Twentieth Century Gravel Mining Landscape, above]	FAR concentration, sparse chipped stone deposit, historic refuse deposits (ca. mid- to late 1930s)	387 historic artifacts, 7 historic marine shells, 4 FARs, 2 flakes	Phase II 450 MW Solar Field	Fan Piedmont
T-05	Trail segment	380 m long, 3 subsegments, 40 cm wide, cobble free	Access Road	Lake Basin
Ethnographic Resources				
Schneider Dance Circle (CA-IMP-2491)	Geoglyph or dance circle		One mile S of project area	
Coyote Mountains	Natural landform		Roughly 10 miles WNW of project area	
Mount Signal	Natural landform		roughly 15 miles SE of project area	
Built-Environment Resources				
Plaster City Historic District	Gypsum mining, processing, and manufacturing facility	Gypsum mine, narrow gauge railroad, and gypsum processing and manufacturing plant	Outside of project area (N of Phase II 450 MW Solar Field)	Fan Aprons, Modern Disturbance
Westside Main Canal (CA-IMP-7834H)	Irrigation canal		Seeley WWTP[6] waterline corridor	Lake Basin
San Diego and Arizona Railroad (37-025680)	Standard gauge railroad		Outside of project area (N of Phase II 450 MW Solar Field)	Multiple
US Route 80 (CA-IMP-7886H)	Remnant highway segments		Outside of project area (N of Phase II 450 MW Solar Field)	Multiple

Cultural Resource Classification and Designation(s)	Resource Type	Description[1]	Project Area Location	Landform Context[2]
US Gypsum Rail-line (Imperial Gypsum Company Railroad, ca. 1922) (CA-IMP-7739H) [Element of Plaster City Historic District, above]	Narrow gauge railroad		Outside of project area (N of Phase II 450 MW Solar Field)	Fan Aprons, Modern Disturbance
Plaster City Plant (P-13-009303) [Element of Plaster City Historic District, above]	Gypsum processing and manufacturing plant		Outside of project area (N of Phase II 450 MW Solar Field)	Modern Disturbance
Fig Canal	Irrigation canal		Seeley WWTP waterline corridor	Multiple
Forget-Me-Not Canal	Irrigation canal		Seeley WWTP waterline corridor	Multiple
Fern Canal	Irrigation canal		Seeley WWTP waterline corridor	Multiple
Foxglove Canal	Irrigation canal		Seeley WWTP waterline corridor	Multiple
Dixie Drain 3	Irrigation canal facility		Seeley WWTP waterline corridor	
Salt Creek Drain 2	Irrigation canal facility		Seeley WWTP waterline corridor	Multiple
Wixon Gravel Mine	Remnants of gravel mining operation		Phase I Emergency Access Road	Multiple
County Gravel Mine	Remnants of gravel mining operation		Phase I 300 MW Solar Field, Phase II 450 MW Solar Field	Multiple

1 - See appendix A for complete archaeological site descriptions.
2 - Landform contexts are those developed in response to Data Requests 111 and 112 (pp. CUL-3–CUL-15, SES 2009h).
3 - Flake counts include whole and partial flakes and shatter.
4 - "FAR" stands for "fire-affected rock."
5 - Flake count includes flakes that may be the result of historic commercial gravel processing.
6 - "WWTP" stands for "wastewater treatment plant."

Historical Significance of the Cultural Resources Inventory

State and Federal regulatory programs require the BLM and the Energy Commission to consider the potential impacts of the proposed action on historically significant cultural resources. Under the subject programs (CEQA, NEPA, and Section 106), formal evaluations of historical significance conclude the process of identifying which cultural resources in the inventory for the proposed action must be given further consideration. Cultural resources that can be avoided by construction may remain unevaluated. Unevaluated cultural resources that cannot be avoided are treated as eligible when determining impacts. The early phases of the typical planning process often results in the development of a preliminary cultural resources inventory that includes more resources than a proposed action would ultimately affect, because the preliminary inventory cannot take into account the final design of the facility. Whereas efforts are on-going to design construction to avoid cultural resources, for the purpose of the present analysis, staff here assumes that the construction, operation, maintenance, and decommissioning of the proposed action may wholly or partially destroy all archaeological sites on the surface of the project area. As a result, staff recommends that all known cultural resource in the project area of analysis be subject to formal evaluations of historical significance.

The time required for formal evaluations of historical significance for the complete cultural resources inventory exceeds the statutory one-year licensing process. Although the Energy Commission has been able to complete evaluations of the historic built environment resources, the formal evaluations of some ethnographic resources and all archaeological resources in the project area of analysis will occur subsequent to BLM and Energy Commission decisions on the proposed action pursuant to terms of a Programmatic Agreement. This subsection provides basic descriptions of the known ethnographic resources and the 25% inventory sample of archaeological resources, preliminary identifications of the archaeological landscapes and districts to which the archaeological resources may contribute, preliminary identifications of the archaeological site types that may be useful in evaluating the historical significance of whole groups of archaeological sites, and basic descriptions of the individual archaeological sites that do not appear to be elements of any archaeological landscape or district or do not conform to any identified site type. Each archaeological resource discussion will conclude, where appropriate, with a preliminary statement on the potential historical significance of each potential landscape, district, type, or particular resource. Discussions of probable impacts to the full range of significant cultural resources will be made in the "Assessment of Impacts and Discussion of Mitigation" subsection below. As noted above, staff is participating in the development of a Programmatic Agreement. One of the purposes of the Programmatic Agreement (PA) is to identify the analytical processes that will be used to determine the significance of cultural resources and ensure appropriate mitigation for any impacts to those resources.

Archaeological Resources

Cultural Resources Table 8
Absolute and Relative Frequencies of the Landform Distribution of Whole Archaeological Resources and Components of Archaeological Resources in the Project Area for the Proposed Action

Resource or Resource Component Classification and Type	Resource or Resource Component by Landform Context				
Prehistoric Archaeological Resources[1]	**Fan Piedmont (N = 30)**	**Fan Piedmont Remnant (N = 7)**	**Fan Aprons (N = 19)**	**Beach Zone (N = 0)**	**Lake Basin (N = 7)**
Sparse[2] chipped stone deposit[3] [Includes components of DRK-004, DRK-010, DRK-023, JFB-010, and RAN-022]	60% (18)	71% (5)	32% (6)		43% (3)
Chipped stone deposit	7% (2)	14% (1)	16% (3)		
Sparse chipped stone and angular quartz deposit	3% (1)				
"Angular rock" concentrations, sparse chipped stone deposit		14% (1)			
Sparse chipped and ground stone deposit	10% (3)		5% (1)		
Sparse chipped and ground stone and ceramic deposit			5% (1)		14% (1)
Sparse chipped stone and ceramic deposit [Includes component of RAN-012]	3% (1)		5% (1)		
Sparse ceramic and chipped stone deposit			5% (1)		
Ceramic and chipped stone deposit					14% (1)
Ceramic deposit	3% (1)				
FAR concentration and isolate chipped stone artifact	3% (1)				

Resource or Resource Component Classification and Type	Resource or Resource Component by Landform Context				
FAR concentration and sparse chipped stone deposit [Includes component of RAN-034]	3% (1)				29% (2)
FAR and cobble concentrations, sparse chipped stone deposit [Includes component of JM-026]			5% (1)		
FAR concentration and sparse chipped stone and ceramic deposit			5% (1)		
FAR concentration, sparse chipped and ground stone and ceramic deposit, sandstone source			5% (1)		
FAR concentrations, human cremations, sparse ceramic and chipped and ground stone deposit			5% (1)		
Trail Segments	7% (2)		11% (2)		
Historical Archaeological Resources	**Fan Piedmont (N = 15)**	**Fan Piedmont Remnant (N = 0)**	**Fan Aprons (N = 2)**	**Beach Zone (N = 0)**	**Lake Basin (N = 2)**
Land surveying monument [Includes components of DRK-004, DRK-010, JFB-010, and RAN-022]	40% (6)				
Land surveying monument, rock cairns [Includes component of DRK-010]	7% (1)				
Aerial land surveying monument			50% (1)		
Ordinance crater	7% (1)				
Pebble and cobble concentrations, isolate historic artifacts [Includes component of RAN-012]	13% (2)				
Historic refuse deposit [Includes component of JM-026]	20% (3)		50% (1)		100% (2)
Historic refuse deposit, rock cairns	7% (1)				

Resource or Resource Component Classification and Type	Resource or Resource Component by Landform Context				
Historic structural ruins, historic FAR concentrations, historic refuse deposit [Includes component of RAN-022]	7% (1)				

1 - The order of artifacts in the site type designations indicates greater to lesser relative frequencies. For example, deposits with the designation "sparse chipped stone and ceramic deposit" have more chipped stone artifacts than ceramic artifacts. The designation "sparse ceramic and chipped stone deposit" indicates that the opposite is true.

2 - "Sparse" indicates a material culture surface frequency of less than 1 artifact per m2.

3 - "Deposit" is a broad term that encompasses both diffuse artifact scatters and diffuse scatters that include periodic artifact concentrations.

= Chipped stone artifacts

= Ground stone artifacts

= Ceramic artifacts

= Fire-affected rock

Prehistoric Archaeological Resources

This analysis takes into consideration a total of 65 prehistoric archaeological resources. The resources include 59 archaeological sites and 4 trail segments that are the result of the 25% sample of the cultural resources inventory for the project area of analysis, the proposed Southwest Lake Cahuilla Shoreline Archaeological District, and the Yuha Basin Discontiguous District (see Cultural Resources Table 7, above). The archaeological sites and trail segments have been sorted into archaeological resource or site types (see Cultural Resources Table 8, above), and then sorted below into 5 site type groups, chipped stone deposits (N = 40), chipped and ground stone deposits (N = 4), ceramic deposits (N = 7), archaeological deposits that include FAR concentrations (N = 8), and trail segments (N = 4). This subsection provides basic descriptions, interpretations, and, where appropriate, preliminary statements on the potential historical significance of each district and site type group.

Preliminary Comment on the Historical Significance of Prehistoric Archaeological Resources

Districts

Southwest Lake Cahuilla Shoreline Archaeological District. Staff is in the process of developing the concept of what is here referred to as the Southwest Lake Cahuilla Shoreline Archaeological District. This is a temporary designation and does not imply that the proposed district is part of or necessarily analogous to the Southwest Lake Cahuilla Recessional Shoreline Archaeological District, a cultural resource listed in the NRHP on December 30, 1999. On the basis of the 25% inventory sample of the archaeological resources in the project area of analysis, the site types that make up the major contributing elements to the district are the deposits above in Cultural Resources Table 8 that have fire-affected rock concentrations in association with variable combinations of cobble concentrations, human cremations, bedrock toolstone sources, chipped stone, ground stone, ceramic, and ornamental artifacts, and faunal remains. Known potential contributing elements of this site type group include CA-IMP-4345, CA-

IMP-4348, EBR-019, EBR-222, and the prehistoric components of JM-026 and RAN-034. Site types that are also contributing elements to the district include those that have combinations of chipped or ground stone artifacts and ceramic artifacts. Known sites in this type group include CA-IMP-3752, -3753, -8731, CA-IMP-8745, EBR-218, RAN-057, RAN-412C. A subset of sites of the “sparse chipped stone deposit” type may be additional contributing elements.

The site types of the proposed district, on the basis of the 25% sample, cluster principally on the distal portions of the Fan Aprons and out on the Lake Basin. Information on the distribution of archaeological sites to the east of the present project area clearly indicates that comparable site types are also present across the Beach Zone landform.

The development of the district concept is not far enough along to articulate the exact historic themes or the potential periods of significance to which the resource relates. The district concept can, however, be said to relate broadly to the later prehistoric use of the littoral resource zone along the former shorelines of Lake Cahuilla and the possibility exists, though no material evidence of it has been found to date, that the portions of the district that include human cremations may have been subject to active or passive use into the historic period.

The proposed district reflects a unique portion of the prehistory of the diverse Native American use of a dynamic ancient body of water which strongly influenced the history of and the interaction among diverse aboriginal cultures in the Colorado Desert. A formal evaluation of the district under the proposed PA would most likely conclude that it is historically significant, both for its information value and for its associative value.

The potential associative value of the district derives primarily from the Native American cremations that are particularly important components of the district. The archaeological sites of the district have human cremations as infrequent components. The cremations are Native American in origin and are presumed to largely date to later prehistory. The cremations appear to occur in a zone along and roughly straddling the 40-foot topographic contour, which trends approximately northwest-southeast along the distal reaches of the Fan Aprons landform just above its contact with the Beach Zone landform. The cremations embody both information value and associate value. The information value of the cremations derives mostly from the discrete material culture assemblages and the radiometric residues that are associated with many of them. Of perhaps greater importance to the Native American community, the cremations reflect intellectual, emotional, and spiritual connections of Native Americans to their respective familial and cultural heritages. If the Southwest Lake Cahuilla Shoreline Archaeological District were ultimately determined to be historically significant, the assessment of the proposed action’s potential impacts on the district, in relation to both its information and associative values, would need to taken into account.

Yuha Basin Discontiguous District. The Yuha Basin Discontiguous District is a prehistoric archaeological district listed in the NRHP on May 24, 1982. The four discontiguous portions of the district are adjacent to and south of the project area. The district nomination form ascribes the primary contributing elements of the district, surface scatters of chipped stone artifacts set into well-developed desert pavements, to the San Dieguito archaeological culture, a Paleoindian period variant. The associations of particular chipped stone artifact scatters with the San Dieguito culture were apparently made on the basis of the incorporation of a scatter into a well-developed desert pavement and a marked degree of artifact patination. Staff does not believe that these indices are a reliable basis to establish the association of archaeological deposits with the San Dieguito culture particularly or the Paleoindian period in general. Staff therefore does not believe that it would be meaningful to ascribe any of the chipped stone deposits in the project area to this district. Staff does not recognize the district as - being in the project area.

Site Types and Site Type Groups

Chipped Stone Deposits. The chipped stone deposit site type group includes chipped stone deposits, sparse chipped stone deposits, sparse chipped stone and angular quartz deposits, and “angular rock” concentrations in association with sparse chipped stone deposits. The absolute majority of the archaeological deposits in this site type group are found on the Fan Piedmont and Fan Piedmont Remnant landforms where they make up the relative majority of site types on those landforms, 70 % and 100 % respectively. The site type group largely appears to represent the procurement of stone suitable for the production of chipped stone artifacts and the early stages of production of expedient flake tools through hard hammer percussion techniques. Mitigation measures provided in the proposed PA would provide the opportunity to consider whether and how the relative ages of the archaeological deposits of this site type group may be determined, and whether and how behavioral associations may be made among these deposits and other prehistoric archaeological deposits in the project area. Determinations on the historical significance of the deposits in the site type group would rely on the outcomes of these considerations.

Chipped and Ground Stone Deposits. Only one site type is present in the 25% sample of the cultural resources inventory of the project area that would represent a chipped and ground stone deposit site type group. That site type is sparse chipped and ground stone deposits. These deposits (N = 4) are found on the Fan Piedmont and Fan Aprons landforms where they make up 10% and 5% respectively of the archaeological deposits on those landforms. The ground stone assemblage for the site type always includes a single mano. The chipped stone assemblage for the type typically includes flakes, cores, hammerstones, and includes chipped stone tools (edge-modified flakes and bifaces) on 2 of the 4 sites. The site type largely appears to represent the procurement of stone suitable for the production of chipped stone artifacts and the early stages of production of expedient flake tools through hard hammer percussion techniques. The edge-modified flakes and bifaces that have been found on some of these sites may represent manufacturing failures, or the intentional or inadvertent discard of the artifacts, perhaps subsequent to resource processing on the site. The presence of ground stone manos on these sites may represent on-site resource processing and subsequent intentional or inadvertent discard, or the manos may simply represent inadvertent discard of artifacts that were in the possession of people who were in transit to other locales when they stopped to procure toolstone. Refinements to the behavioral interpretation of the site type, and determinations on the historical significance of the deposits of the type would be made under provisions in the proposed PA and would rely on the outcomes of those refinements.

Ceramic Deposits. The ceramic deposit site type group includes ceramic deposits, ceramic and chipped stone deposits, sparse ceramic and chipped stone deposits, sparse chipped stone and ceramic deposits, and sparse chipped and ground stone and ceramic deposits. The absolute majority of the archaeological deposits in this site type group are found on the Fan Aprons and Beach Zone landforms, 15% and 28% respectively. Sites of this type group were also found on the Fan Piedmont (N = 2, or 6% of the sites on that landform). One appears to be a pot-drop (ceramic deposit) where a single ceramic vessel was inadvertently dropped on the ground and broken, and the other is a sparse chipped stone and ceramic deposit.

The site type group, excluding the ceramic deposit (pot-drop) type, can be divided into two basic subgroups, deposits that have more ceramic sherds than chipped stone flakes and deposits that have more chipped stone flakes than ceramic sherds. The ceramic and chipped stone deposits and sparse ceramic and chipped stone deposits (N = 2) may represent areas where the duration of area use was more than transitory. The higher frequency of ceramic sherds in these deposits would appear to indicate activity in the areas of the deposits that was of long enough duration, more than a few hours, to allow deposition of ceramic sherds as a result of inadvertent breakage. One of the sites in this subgroup (RAN-412C) was actually found to include a single FAR, which may indicate the nearby subsurface presence of fire features, the construction and use of which may indicate resource processing or food preparation, or temporary habitation.

The ceramic deposit site type subgroup that includes sparse chipped stone and ceramic deposits, and sparse chipped and ground stone and ceramic deposits appear to indicate more transitory behavior with a relatively strong emphasis on the procurement of stone suitable for the production of chipped stone artifacts and the early-stage production of expedient flake tools through hard hammer percussion techniques. The deposits include chipped stone flake to ceramic sherd ratios that vary from approximately 39:1 to 1:1 and average 11:1. The deposits also typically include hammerstones and cores, and may include relatively minor numbers of whole and fragmentary chipped and ground stone tools, and tested cobbles. Refinements to the behavioral interpretation of the site types in this subgroup and those of the subgroup above, and determinations on the historical significance of the deposits of both subgroups would be made under provisions in the proposed PA and would rely on the outcomes of those refinements.

Archaeological Deposits that Include FAR Concentrations. The majority of the different site types in the FAR concentration site type group are contributing elements to the proposed Southwest Lake Cahuilla Shoreline Archaeological District. The absolute majority of the archaeological deposits in this site type group are found on the Fan Aprons and Beach Zone landforms, 20% and 29% respectively. A number of the archaeological sites in this type group are materially diverse and spatially complex deposits that represent a relatively wide range of Native American activity. The behavioral interpretation of the site types in this group, and determinations on the historical significance of the deposits would be made under provisions in the proposed PA and would rely on the interpretations ultimately derived for them.

Trail Segments. The 25% sample of the cultural resources inventory for the proposed includes what are thought to be 4 prehistoric trail segments. The trail segments in the sample are found on the Fan Piedmont and Fan Aprons landforms, and account for 7% and 11% of the prehistoric archaeological resources on those landforms, respectively. The segments are parts of what appears to have been a relatively complex prehistoric trail system that facilitated pedestrian travel east and west across the project area between ancient Lake Cahuilla and the Coyote Mountains, and north and south along the former shorelines of the lake. Study to reconstruct the broader trail system and individual trails, interpretations of the purpose and use of the trails, and determinations on the historical significance of the preserved trail segments would be made under provisions in the proposed PA.

Historical Archaeological Resources

This analysis takes into consideration a total of 21 historical archaeological resources. The resources include 19 archaeological sites that are the result of the 25 % sample of the cultural resources inventory for the project area of analysis, the Anza Trail, and the proposed Early Twentieth Century Gravel Mining Landscape (see Cultural Resources Table X, above). The archaeological sites have been sorted into archaeological resource or site types (see Cultural Resources Table 8, above), and then sorted below into 3 site type groups, surveying monuments (N = 8), historic refuse deposits (N = 7), and pebble and cobble concentrations (N = 2). There are also 2 further archaeological sites that do not fit into any of the site type groups, the historical archaeological component of RAN-022 and RAN-003. This subsection provides basic descriptions, interpretations, and, where appropriate, preliminary statements on the potential historical significance of the portion of the Anza Trail in the project area of analysis, the gravel mining landscape, each site type group, and both of the stand-alone archaeological sites.

Preliminary Comment on the Historical Significance of Historical Archaeological Resources

Juan Bautista de Anza National Historic Trail

Congress established the Anza Trail under the National Trails Act (16 USC 1241) in 1990. The approximately 1,210-mile-long trail corridor runs from Nogales, Arizona through the project area for the proposed action to San Francisco. The Yuha Desert portion of the trail corridor makes up one of the least disturbed landscapes along the entire route, and, as a consequence, this portion of the corridor retains the ability to convey the historical significance of the route and facilitates the public interpretation of it.

The Anza Trail Management and Use Plan shows portions of the project area to fall in a High Potential Route Segment between 2 historic expedition campsites. The trail corridor therefore has the potential to contain material evidence of the establishment and subsequent use of the trial in the mid-1770s, evidence which would potentially be eligible for inclusion in the NRHP, should such evidence be present. No such evidence has been found in the project area to date and it is not known, in fact, whether any archaeological sites directly related to the Anza expedition have ever been found anywhere along the course of the trail through Mexico, Arizona, or California. Further research on the presence or absence of material remains of the use of the Anza Trail in the project area, further inventory of the character and extent of known or potential contributing elements of the Anza Trail in the project area of analysis, and appropriate determinations on the historical significance of any remains and elements found would be made under provisions in the proposed PA.

Landscapes

Early Twentieth Century Gravel Mining Landscape. Gravel mining appears to have been a relatively widespread form of land use in the project area from approximately 1900 through the early 1960s. Archival information has been found on the operation of two mid-twentieth century gravel mining operations, the Wixon Gravel Mine in the eastern portion of the project area and the County Gravel Mine in the north-central portion of the project area. Archaeological evidence also suggests the presence of an earlier gravel mining operation toward the south-central portion of the project area. This earlier operation, on the basis of the data presently in hand, appears to date from approximately 1900 to 1920 and further appears to have been operated using older, largely non-mechanical gravel mining techniques. These techniques appear to have involved the use of draft animals to pull rakes or scraping sleds across the relatively well-developed desert pavements of the Fan Piedmont landform to extract the gravel resource. This apparent form of mining has left the mined desert pavements with a distinctive pattern of scarification, linear swaths of the ground surface relatively devoid of gravel and punctuated at somewhat regular intervals with low gravel lag mounds. The scarification pattern permits one to readily delineate the area that was subject to this form of mining.

Staff recommends that this be classified as a historical archaeological landscape, an industrial landscape that represents the apparent early twentieth century gravel mining operation in the south-central portion of the project area. The landscape, on the basis of the results of the 25% sample of the cultural resources inventory for the proposed action, presently includes the area that exhibits the distinctive pattern of scarification that was the result of this operation and the historical archaeological component of RAN-022, an apparent early twentieth century work camp. The further inventory of potential contributing elements to the proposed landscape, refinements to the recordation of those elements, and determinations on the historical significance of the landscape as a whole and of the individual contributing elements, both as contributing elements and as stand-alone archaeological resources would be made under provisions in the proposed PA.

Site Types and Site Type Groups

Surveying Monuments. The surveying monument site type group includes land surveying monuments, land surveying monuments that include rock cairns, and aerial land surveying monuments. The archaeological deposits in this site type group are, with one exception, found on a single landform in the project area, the Fan Piedmont landform, where they make up 47% of the historical archaeological site types there. The one exception is the one aerial land surveying monument in the project area that was found on the Fan Aprons landform. That monument represents 50% of the historical archaeological deposits found on that landform. The site type group largely appears to represent the subdivision of the Fan Piedmont landform by the General Land Office (GLO) in the early twentieth century. The monuments remain valid and legal parcel corners and continue to be subject to restrictions that forbid disturbance. It is of interest that such monuments do not appear to be more evenly distributed in the 25% inventory sample. The apparent absence or perhaps lower incidence of the monuments on the other landforms in the project area may indicate that the subdivision of the Fan Piedmont landform became a priority for the GLO, relative to the other landforms, perhaps to subdivide gravel mining leases, or it may indicate that such monuments on the other landforms have been subject to burial, erosion, or more disturbance. Although the proposed PA would provide for refinements to present draft determinations on the historical significance of the monuments in the site type group, staff believes that it is unlikely that they would ultimately recommend the resources as significant.

Historic Refuse Deposits. The historic refuse deposit site type group includes historic refuse deposits, and historic refuse deposits that include rock cairns. The archaeological deposits in this site type group are found on the Fan Piedmont, Fan Aprons, and Beach Zone landforms where they make up 27%, 50% and 100% of the historical archaeological site types, respectively. The behavioral interpretation of the site types in this group, and determinations on the historical significance of the deposits would be made under provisions in the proposed PA and would rely on the interpretations ultimately derived for them.

Pebble and Cobble Concentrations. The pebble and cobble concentration site type includes pebble and cobble concentrations in association with isolate historic artifacts. The archaeological deposits of this site type are found exclusively on the Fan Piedmont landform where they make up 13% of the historical archaeological site types there. The behavioral interpretation of the site type, and determinations on the historical significance of the deposits would be made under provisions in the proposed PA and would rely on the interpretations ultimately derived for them.

Individual Archaeological Sites

Historical Archaeological Component of RAN-022. The historical archaeological component of RAN-022 includes historic structural ruins, historic FAR concentrations, and historic refuse deposits. Refinements to the inventory-phase documentation of the component, the behavioral interpretation of the site, and determinations on the historical significance of the deposits would be made under provisions in the proposed PA and would rely on the interpretations ultimately derived for them.

RANA-003. RANA-003 is an ordnance crater found in association with a scatter of apparent shrapnel. Refinements to the inventory-phase documentation of the component, the behavioral interpretation of the site, and determinations on the historical significance of the deposits would be made under provisions in the proposed PA and would rely on the interpretations ultimately derived for them.

Ethnographic Resources

This analysis presently takes into consideration one ethnographic resource, the Schneider Dance Circle (CA-IMP-2491). It is not however the only apparent ethnographic resource in the vicinity of the project area. The Coyote Mountains to the west-northwest of the project area and Mount Signal to the southeast of it figure prominently in Kwaaymii legend. Sparsely documented ethnographic resources along BLM Route 264 from the town of Ocotillo east to BLM Route 274 and along BLM Route 274 itself may also be in sight of the project area. Extant assessments of the potential for visual impacts to these resources will have to be further refined under the proposed PA for the proposed action. Ethnographic resources noted by the applicant along BLM Route 264 include an apparent prehistoric trail, a number of coble piles that once appear to have been a spoked-wheel geoglyph, 2 cleared circles referred to by informants to the applicant as the “heavenly snake” (may be CA-IMP-4381, which has been described as a ground figure-snake and gravel berm, and 2 fire rings, one of which appears to have been recently used), and 6 sleeping circles. Further ethnographic resources along BLM Route 274, in addition to the Schneider Dance Circle, include the Yuha Geoglyph (CA-IMP-322), the Power Geoglyph (CA-IMP-4876), the Yuha Burial, another apparent prehistoric trail, a resource that the informants to the applicant referred to as a “spirit break,” and a large quartz smash.

Preliminary Discussion of the Historical Significance of Ethnographic Resources

Schneider Dance Circle

The Schneider Dance Circle (CA-IMP-2491), one of the Yuha Mesa geoglyphs along BLM Route 274, may be in sight of the proposed project area. The Coyote Mountains and Mount Signal are in sight of it. New determinations on the historical significance of these and other ethnographic resources and reconsideration of any extant determinations would be made under provisions in the proposed PA.

Built-Environment Resources

The proposed action appears to have the potential to affect each of the 14 built-environment resources in the project area of analysis (see Cultural Resources Table 7, above), none of which staff recommends as eligible for either the NRHP or the CRHR. The built-environment resources inventory includes 7 cultural resources that represent the theme of irrigation agriculture (Westside Main Canal, Fig Canal, Forge-Me-Not Canal, Fern Canal, Foxglove Canal, Dixie Drain 3, and Salt Creek Drain 2), 3 resources that represent the mining, processing, and manufacturing of gypsum-derived products (Plaster City Plant, US Gypsum Rail-line, and Plaster City Historic District), 2 resources that represent the theme of transportation (San Diego and Arizona Railroad, and US Route 80), and 2 resources that represent gravel mining (Wixon Gravel Mine, and County Gravel Mine).

Brief descriptions of the 14 built-environment resources and recommendations on their historical significance are presented below. The information for the descriptions and evaluations is drawn from the applicant’s cultural resource technical reports and the applicant’s responses to Energy Commission and BLM data requests (SES 2008e, 2009h, and 2009z).

Historical Significance Recommendations for Built-Environment Resources

Westside Main Canal (CA-IMP-7834H)

The Westside Main Canal is an approximately 20-mile-long water conveyance structure that presently runs from the area near the International Border north to the Brawley-Westmorland area. The canal, originally a wooden flume in Mexico known as the Encina Canal, was extended north into the United States by approximately 1906 and across the proposed alignment for the Seeley WWTP waterline by 1908. It was modified and incorporated into the All-American Canal System about 1941.

The present analysis focuses on a one-mile-long segment of the canal, one-half mile north and south of the location where the Seeley WWTP waterline would cross the canal, east of the project site. This particular segment has earthen banks and is roughly U-shaped in profile. The segment measures approximately 25 feet wide by 10 feet deep.

The Westside Main Canal, as a whole, may be historically significant, because it reflects agricultural development associated with the construction and operation of the All-American Canal from 1941 to 1950. More specifically, the canal may be significant under Criteria A and C of the NRHP and Criteria 1 and 3 of the CRHR for its association with the development of commercial irrigation agriculture in Imperial County to the west of the New River. The segment of the canal in the project area of analysis for the proposed action does not, however, retain enough integrity to convey the historic significance of the whole resource during its period of significance, due to the substantive impacts that routine canal maintenance has had on the profile of the conveyance. The segment does not appear to possess sufficient integrity of workmanship, design, setting, feeling, or association. Staff therefore recommends that the segment of the Westside Main Canal in the project area of analysis would not contribute to either the NRHP or CRHR eligibility of the canal as whole, should it ever be determined to be so eligible.

Fig Canal

The Fig Canal is a water conveyance structure that runs approximately 4 miles from the Westside Main Canal on the south to Fern Canal on the north. The canal is part of the Westside Main Canal system, which was incorporated into the All-American Canal System in 1941. Although the construction date of the resource is presently unknown, it appears on local maps by 1912.

The present analysis focuses on the segment of the canal that intersects Evan Hewes Highway where the Seeley WWTP waterline would cross the canal, east of the project site. This particular segment is a concrete lined channel, roughly trapezoidal in profile with concrete and earthen banks. This segment measures approximately 15 feet wide by 8 feet deep.

The Fig Canal, as a whole, may be historically significant, because it reflects agricultural development associated with the construction and operation of the All-American Canal from 1941 to 1950. More specifically, the canal may be significant under Criteria A and C of the NRHP and Criteria 1 and 3 of the CRHR for its association with the development of commercial irrigation agriculture in Imperial County to the west of the New River. The segment of the canal in the project area of analysis for the proposed action does not, however, retain enough integrity to convey the historic significance of the whole resource during its period of significance, due to the substantive impacts that routine canal maintenance has had on the profile of the conveyance. The segment does not appear to possess sufficient integrity of workmanship, design, setting, feeling, or association. Staff therefore recommends that the segment of the Fig Canal in the project area of analysis would not contribute to either the NRHP or CRHR eligibility of the canal as whole, should it ever be determined to be eligible.

Forget-Me-Not Canal

The Forget-Me-Not Canal is a water conveyance structure that runs approximately 3 miles from the Westside Main Canal on the south to Dixie Drain 5 on the north. The canal is part of the Westside Main Canal system which was incorporated into the All-American Canal System in 1941. Although the construction date of the resource is presently unknown, it appears on local maps by 1912.

The present analysis focuses on the segment of the canal that intersects Evan Hewes Highway where the Seeley WWTP waterline would cross the canal, east of the project site. The segment of the canal bisected by the Evan Hewes Highway is a concrete lined channel with concrete and earthen banks and measures approximately 20 feet wide by 10 feet deep.

The Forget-Me-Not Canal, as a whole, may be historically significant, because it reflects agricultural development associated with the construction and operation of the All-American Canal from 1941 to 1950. More specifically, the canal may be significant under Criteria A and C of the NRHP and Criteria 1 and 3 of the CRHR for its association with the development of commercial irrigation agriculture in Imperial County to the west of the New River. The segment of the canal in the project area of analysis for the proposed action does not, however, retain enough integrity to convey the historic significance of the whole resource during its period of significance, due to the substantive impacts that routine canal maintenance has had on the profile of the conveyance. The segment does not appear to possess sufficient integrity of workmanship, design, setting, feeling, or association. Staff therefore recommends that the segment of the Forget-Me-Not Canal in the project area of analysis would not contribute to either the NRHP or CRHR eligibility of the canal as whole, should it ever be determined to be eligible.

Fern Canal and Drain

The Fern Canal is a water conveyance structure that runs approximately 8 miles in a north-south configuration. The Fern Drain, also a water conveyance structure, runs approximately one-and-one-half miles northeast from Fern Canal. The canal and drain are part of the Westside Main Canal system which was incorporated into the All-American Canal System in 1941. Although the construction dates of the resources are presently unknown, the canal appears on local maps in 1908 and the drain in 1940.

The present analysis focuses on the interrelated segments of the canal and drain that intersect Evan Hewes Highway where the Seeley WWTP waterline would cross the canal, east of the project site. The segment of the canal bisected by the Evan Hewes Highway is a trapezoidal, concrete lined channel and measures approximately 20 feet wide by 10 feet deep. The segment of the drain that intersects Evan Hewes Highway is an unlined earthen channel approximately 20 feet wide and 15 feet deep.

The Fern Canal, as a whole, may be historically significant, because it reflects agricultural development associated with the construction and operation of the All-American Canal from 1941 to 1950. More specifically, the canal may be significant under Criteria A and C of the NRHP and Criteria 1 and 3 of the CRHR for its association with the development of commercial irrigation agriculture in Imperial County to the west of the New River.

The Fern Drain does not appear to reflect the agricultural development associated with the construction and operation of the All-American Canal from 1941-1950, nor does it appear to be associated with the lives of significant persons or likely to yield information important to prehistory or history.

The segments of the canal and drain in the project area of analysis for the proposed action do not, however, retain enough integrity to convey the historic significance of the whole resource during its period of significance, due to the substantive impacts that routine canal maintenance has had on the profile of the conveyance. These segments do not appear to possess sufficient integrity of workmanship, design, setting, feeling, or association. Staff therefore recommends that the segments of the Fern Canal and Drain in the project area of analysis would not contribute to either the NRHP or CRHR eligibility of the canal as whole, should it ever be determined to be eligible.

Foxglove Canal

The Foxglove Canal is a water conveyance structure that runs approximately 10 miles in a north-south configuration, adjacent to the Westside Main Canal. The canal is part of the Westside Main Canal system which was incorporated into the All-American Canal System in 1941. Although the construction date of the resource is presently unknown, it appears on local maps by 1912.

The present analysis focuses on the segment of the canal that intersects Evan Hewes Highway where the Seeley WWTP waterline would cross the canal, east of the project site. The segment of the canal bisected by the Evan Hewes Highway is a concrete lined channel with concrete levees and vegetated earthen banks, measuring approximately 20 feet wide by 10 feet deep.

The Foxglove Canal, as a whole, may be historically significant, because it reflects agricultural development associated with the construction and operation of the All-American Canal from 1941 to 1950. More specifically, the canal may be significant under Criteria A and C of the NRHP and Criteria 1 and 3 of the CRHR for its association with the development of commercial irrigation agriculture in Imperial County to the west of the New River. The segment of the canal in the project area of analysis for the proposed action does not, however, retain enough integrity to convey the historic significance of the whole resource during its period of significance, due to the substantive impacts that routine canal maintenance has had on the profile of the conveyance. The segment does not appear to possess sufficient integrity of workmanship, design, setting, feeling, or association. Staff therefore recommends that the segment of the Foxglove Canal in the project area of analysis would not contribute to either the NRHP or CRHR eligibility of the canal as whole, should it ever be determined to be eligible.

Dixie Drain 3

Dixie Drain 3 is a water conveyance structure that runs approximately 8 miles from Dixie Drain 1 on the north to the Westside Main Canal on the south. The drain is part of the Westside Main Canal system which was incorporated into the All-American Canal System in 1941. Although the construction date of the resource is presently unknown, it appears on local maps by 1940.

The present analysis focuses on the segment of the drain that intersects Evan Hewes Highway where the Seeley WWTP waterline would cross the canal, east of the project site. The segment of the drain bisected by the Evan Hewes Highway is an unlined earthen channel, approximately 10 feet wide and 8 feet deep, to the north of the highway and exposed corrugated metal pipe to the south.

Dixie Drain 3, as a whole, may be historically significant, because it reflects agricultural development associated with the construction and operation of the All-American Canal from 1941 to 1950. More specifically, the drain may be significant under Criteria A and C of the NRHP and Criteria 1 and 3 of the CRHR for its association with the development of commercial irrigation agriculture in Imperial County to the west of the New River. The segment of the drain in the project area of analysis for the proposed action does not, however, retain enough integrity to convey the historic significance of the whole resource during its period of significance, due to the substantive impacts that routine drain maintenance has had on the profile of the conveyance. The segment does not appear to possess sufficient integrity of workmanship, design, setting, feeling, or association. Staff therefore recommends that the segment of the Dixie Drain 3 in the project area of analysis would not contribute to either the NRHP or CRHR eligibility of the drain as whole, should it ever be determined to be eligible.

Salt Creek Drain 2

Salt Creek Drain 2 is a water conveyance structure that runs approximately 3 miles in a north-south configuration. The drain is part of the Westside Main Canal system which was incorporated into the All-American Canal System in 1941. Although the construction date of the resource is presently unknown, it appears on local maps by 1957.

The present analysis focuses on the segment of the drain that intersects Evan Hewes Highway where the Seeley WWTP waterline would cross the canal, east of the project site. The segment of the drain bisected by the Evan Hewes Highway is a concrete-lined channel approximately 6 feet wide and 4 feet deep.

Salt Creek Drain 2, as a whole, may be historically significant, because it reflects agricultural development associated with the construction and operation of the All-American Canal from 1941 to 1950. More specifically, the drain may be significant under Criteria A and C of the NRHP and Criteria 1 and 3 of the CRHR for its association with the development of commercial irrigation agriculture in Imperial County to the west of the New River. The segment of the drain in the project area of analysis for the proposed action does not, however, retain enough integrity to convey the historic significance of the whole resource during its period of significance, due to the substantive impacts that routine drain maintenance has had on the profile of the conveyance. The segment does not appear to possess sufficient integrity of workmanship, design, setting, feeling, or association. Staff therefore recommends that the segment of the Salt Creek Drain 2 in the project area of analysis would not contribute to either the NRHP or CRHR eligibility of the drain as whole, should it ever be determined to be eligible.

Plaster City Plant (P-13-009303)

The Plaster City Plant is a grouping of industrial buildings and structures on approximately 160 acres immediately north of the project area. The complex extends north and south of the Evan Hewes Highway. The original Plaster City Plant complex was built between 1920 and 1921 by the Imperial Gypsum and Oil Company to process the material from a 25-ton gypsum deposit at Split Mountain in the Fish Creek Mountains. The gypsum was brought to the plant via the US Gypsum Rail-Line (USGRL), which was constructed by Imperial Gypsum and Oil for this purpose. Imperial Gypsum and Oil suffered financial trouble shortly after opening the Plaster City Plant and sold the operation in 1924 to the Pacific Portland Cement Company. The area became known as "Plaster City" at this time. Pacific Portland replaced the original crusher facility with a new, larger facility shortly after acquiring the operation.

Plaster City, including the USGRL, was acquired in 1947 by the US Gypsum Company, and plans were made immediately to modernize the plant. The improvement project, including a new 900-foot belt, 3 separate DC drives and 2 kilns, was completed in 1948. During the 1940s through the 1960s, Plaster City's products included plaster board, sacked lath, and plaster for agricultural uses. The plant went on to produce drywall and wallboard for residential construction and sent gypsum to a stucco plant in Los Angeles. By 1970 a new truck road had been constructed to the mine, rendering the USGRL obsolete and it went out of operation. The Plaster City Plant has undergone a complete remodel over the past 15 years, including the removal of a number of historic-period buildings, the addition of monumental-scale construction, and major changes to the plant's circulation network and spatial relationships.

The existing Plaster City Plant north of the Evan Hewes Highway includes the plant's administrative offices, parking/staging areas, and a non-historic period processing barn. The administration building is a two-story Contemporary-style structure flanked by two one-story wings. The main section of the administration building appears to date from the 1940s, and the wings appear to be additions dating from within the past 40 years. The building has been heavily altered, and currently has a non-historic coarse stucco exterior finish, and non-historic metal and plastic windows. The administrative building is surrounded by non-historic trailers and modular buildings, also housing administrative functions. To the east of the administrative buildings is a large non-historic 4-story processing barn, used to store raw materials.

The area south of the highway is where the majority of the plant's industrial actions take place, and includes 2- to 4-story metal-framed prefabricated or tilt-up warehouses and storage containers, dating from the past 15 to 20 years. Most of these structures feature exposed superstructures, skeletal systems, exterior staircases and circulation networks, metal sheathing and cladding and exposed ventilation systems. Along the east end of the plant's southern portion is a historic-period 2-story warehouse which appears to date from the late 1940s. The building is metal-framed and rectangular in form with multi-pane metal sash industrial style windows, and garage bays with non-historic roll-up doors.

The Plaster City Plant does not appear to meet the eligibility criteria as a historic resource for the NRHP or CRHR. More specifically, the plant does not appear to possess significance under Criteria A of the NRHP or Criteria 1 of the CRHR for association with events that have made a significant contribution to the broad patterns or our history. The plant does not illustrate the two-year history of the Imperial Gypsum and Oil Company, nor does it have a specific connection with the Pacific Portland Cement Company or the US Gypsum Company. The plant does not appear to be associated with significant events. The plant is related to Sam Dunaway, a founder of the Imperial Gypsum and Oil Company. Sam Dunaway is primarily known for being Imperial County's druggist and merchant, rather than a gypsum industrialist. It is also loosely associated with A.R. Rupp, a former US Gypsum executive, but the property does not illustrate his achievements within the gypsum industry. Therefore the plant does not appear to possess significance under Criteria B of the NRHP and Criteria 2 of the CRHR. Additionally, the plant does not embody distinctive characteristics of industrial design from the early 20th century. The majority of the buildings and structures are from outside the historic period and do not convey the historic feeling, setting, or visual appearance of the plant. The plant has been heavily altered and no long retains its original appearance and form and does not appear to meet Criteria C of the NRHP or Criterion 3 of the CRHR. Plaster City does not appear to be likely to yield important information in prehistory or history, and does not appear to be significant under Criteria D of the NRHP or Criteria 4 of the CRHR. Due to the loss of the original and historic-period structures, the Plaster City Plant does not appear to possess sufficient integrity of locations, setting, design, feeling, materials workmanship and association. Staff therefore recommends that the Plaster City Plant would not to be individually eligible for listing on the NRHP or the CRHR.

US Gypsum Rail-line (Imperial Gypsum Company Railroad) (CA-IMP-7739H)

The US Gypsum Rail-Line (USGRL) was constructed in 1921 by the Imperial Gypsum and Oil Company to carry gypsum from the mine at Split Mountain in the Fish Creek Mountain to the Plaster City Plant, a distance of 27 miles. Imperial Gypsum and Oil suffered financial trouble shortly after opening the Plaster City Plant and sold the operation in 1924 to the Pacific Portland Cement Company. The area became known as "Plaster City" at this time. Plaster City, including the USGRL, was acquired in 1947 by the US Gypsum Company, and plans were made immediately to modernize the plant. During the 1940s through the 1960s, Plaster City's products included plaster board, sacked lath, and plaster for agricultural uses. The plant went on to produce drywall and wallboard for residential construction and sent gypsum to a stucco plant in Los Angeles. By 1970 a new truck road had been constructed to the mine, rendering the USGRL obsolete and it went out of operation.

The present analysis focuses on the one-half mile segment of the USGRL within the project area of analysis, directly north of the project boundary. The USGRL travels north-south, and the portion within the project area of analysis is the southern terminus. The USGRL is a single-track narrow gauge railroad, which sits on a bed covered with small ballasts. This section of the rail is at grade, and the rail lines have been replaced several times to accommodate heavier loads. Toward the southern portion of the property the USGRL spurs into the San Diego-Arizona Railroad and travels eastward toward El Centro. The section of rail within the project area of analysis is surrounded by non-historic industrial buildings.

The US Gypsum Rail-Line does not appear to meet the eligibility criteria as a historic resource for the NRHP or CRHR. More specifically, the USGRL does not appear to possess significance under Criteria A of the NRHP or Criteria 1 of the CRHR for association with events that have made a significant contribution to the broad patterns or our history. The USGRL does not illustrate the two-year history of the Imperial Gypsum and Oil Company, nor does it have a specific connection with the Pacific Portland Cement Company or the US Gypsum Company. The USGRL does not appear to be associated with significant events. The USGRL is related to Sam Dunaway, a founder of the Imperial Gypsum and Oil Company. Sam Dunaway is primarily known for being Imperial County's druggist and merchant, rather than a gypsum industrialist. Therefore the USGRL does not appear to possess significance under Criteria B of the NRHP and Criteria 2 of the CRHR. Additionally, the plant does not embody distinctive characteristics of railroad design from the early 20th century. The railroad's historic character and features have been impacted by alterations and non-historic elements. It does is not representative of distinctive engineering qualities to be considered significant and does not appear to meet Criteria C of the NRHP or Criteria 3 of the CRHR. The portion of the USGRL within the project area of analysis does not appear to be likely to yield important information in prehistory or history, and does not appear to be significant under Criteria D of the NRHP or Criteria 4 of the CRHR. The portion of the USGRL in the project area of analysis does not appear to possess sufficient integrity of locations, setting, design, feeling, materials workmanship and association. Staff therefore recommends that the segment of the USGRL in the project area of analysis would not contribute to either the NRHP or CRHR eligibility of the railroad line as whole, should it ever be determined to be eligible

Plaster City Plant District

The Plaster City Plant District would include the grouping of industrial buildings and structures on approximately 160 acres immediately north of the project area; the USGRL railway; and the gypsum mine on the northern terminus of the railway. The original Plaster City Plant complex was built between 1920 and 1921 by the Imperial Gypsum and Oil Company to process the material from a 25-ton gypsum deposit at Split Mountain in the Fish Creek Mountains. The gypsum was brought to the plant via the 27-mile US Gypsum Rail-Line (USGRL), which was constructed by Imperial Gypsum and Oil for this purpose. Imperial Gypsum and Oil suffered financial trouble shortly after opening the Plaster City Plant and sold the operation in 1924 to the Pacific Portland Cement Company. The area became known as "Plaster City" at this time.

Plaster City, including the USGRL and the mine, was acquired in 1947 by the US

Gypsum Company, and plans were made immediately to modernize the plant. During the 1940s through the 1960s, Plaster City's products included plaster board, sacked lath, and plaster for agricultural uses. The plant went on to produce drywall and wallboard for residential construction and sent gypsum to a stucco plant in Los Angeles. By 1970 a new truck road had been constructed to the mine, rendering the USGRL obsolete and it went out of operation. The Plaster City Plant has undergone a complete remodel over the past 15 years, including the removal of a number of historic-period buildings, the addition of monumental-scale construction, and major changes to the plant's circulation network and spatial relationships.

The Plaster City Plant District, as a whole, may be historically significant because it is an intact example of a continuously operating gypsum mining operation and representative of large-scale industrial development in Imperial County from 1920-1924, specifically under Criteria A and C of the NRHP and Criteria 1 and 3 of the CRHR. However, due to the loss of the original and historic-period structures at the plant site, which would be the core of the district, the Plaster City Plant does not retain enough integrity to convey the historic significance of the whole resource during its period of significance. Therefore the Plaster City Plant District does not appear to possess sufficient integrity of locations, setting, design, feeling, materials workmanship and association. Staff therefore recommends that the Plaster City Plant District would not be eligible for listing on the NRHP or the CRHR.

San Diego and Arizona Railroad (37-025680)

The San Diego and Arizona Railroad (SD-AZ RR) is a standard-gauge railroad, traveling east-west through the project area. The 10-mile section of the railroad within the project area of analysis is a small portion of the larger, 150-mile historic period railroad. The SD-AZ RR was one of the last railroads constructed in the United States, completed in 1919, and stretched eastward from San Diego to El Centro, California. The railroad was developed by John D. Spreckles and his brother, Adolph, sons of the San Francisco sugar millionaire Claus Spreckles, and Edward H. Harriman, who controlled the boards of the Southern Pacific and Central Pacific Railroads. Construction began in 1907, and the section of rail within project area of analysis was built between 1907 and 1915. Highway construction and increases in automotive transport brought strong competition for the railroad's passenger service and the SD-AZ RR carried freight exclusively after 1951. Maintenance costs were deemed too expensive following landslides, flooding, and several fires on wooden trusses and in tunnels and the line was abandoned in 1977, with only a few segments remaining in operation. Portions of line within the project area were abandoned at this time.

The present analysis focuses on the approximately 10-mile portion of the SD-AZ RR located along the northern boundary of project area. The standard-gauge railroad sits on a bed of small to medium ballasts. The portion of rail east of Plaster City sits primarily at grade. It is still in active use and has been modernized in some areas. The portion of the rail west of Plaster City is primarily elevated above grade and no longer in use.

The San Diego and Arizona Railroad does not appear to meet the eligibility criteria as a historic resource for the NRHP or CRHR. More specifically, the SD-AZ RR does not appear to possess significance under Criteria A of the NRHP or Criteria 1 of the CRHR for association with events that have made a significant contribution to the broad patterns or our history. The railroad's construction and operation is not considered an event which has made a significant contribution to the broad patterns of our history, and only made minor contributions to the development of San Diego and national defense by transporting military supplies to San Diego during World War II and the Korean War. Although the SD-AZ RR is associated with John and Adolph Spreckles and Edward H. Harriman, all significant people in the history of the United States and California, all three are generally better known for more significant accomplishments in railroading, business and other endeavors. Therefore the SD-AZ RR does not appear to possess significance under Criteria B of the NRHP and Criteria 2 of the CRHR. Additionally, the railroad does not embody distinctive characteristics of railroad design from the early 20th century. The railroad's historic character and features have been impacted by alterations and non-historic elements, and does not appear to meet Criteria C of the NRHP or Criteria 3 of the CRHR. The portion of the SD-AZ RR within the project area of analysis does not appear to be likely to yield important information in prehistory or history, and does not appear to be significant under Criteria D of the NRHP or Criteria 4 of the CRHR. The segment of the SD-AZ RR in the project area of analysis does not appear to possess sufficient integrity of setting, feeling, materials workmanship and association. Staff therefore recommends that the segment of the SD-AZ RR in the project area of analysis would not contribute to either the NRHP or CRHR eligibility of the railroad line as whole, should it ever be determined to be eligible.

US Route 80 (CA-IMP-7886H), Evan Hewes Highway

U.S Route 80, also known as Evan Hewes Highway, is a two-lane built-up asphalt highway that is part of a transcontinental 2,725-mile highway traveling from San Diego, California to Savannah, Georgia. Officially commissioned in 1926, it was an amalgamation of 2 of the original 9 transcontinental routes. Prior to its designation as part of Highway 80, the roadway existed as the major east-west linear route through southeast California. First developed in 1912, the portion of Highway 80 within the project area of analysis appears on maps in 1918.

The present analysis focuses on the approximately 10-mile-long segment of Highway 80 located along the northern boundary of the project site. The road has undergone routine maintenance and has been resurfaced on several occasions. The original, bypassed alignment of the road lies to the immediate south of the present roadway, and is concrete, single-lane and incomplete.

US Route 80 within the project area of analysis does not appear to meet the eligibility criteria as a historic resource for the NRHP or CRHR. The highway does not appear to be associated with events that made a significant contribution to the broad patterns of history either individually or as part of the whole history of Route 80, and does not appear to meet Criteria A of the NRHP or Criteria 1 of the CRHR. US Route 80 also does not appear to possess significance under Criteria B of the NRHP or Criteria 2 of the CRHR. It is associated with Col. Ed Fletcher, who is significant in the history of the United States and California, but is better known for more significant accomplishments in land and water development, local politics and civic leadership in San Diego County. Additionally, the highway does not embody distinctive characteristics of highway design from the early 20th century. The highway's historic character and features have been impacted by alterations and non-historic elements, and it does not appear to meet Criteria C of the NRHP or Criteria 3 of the CRHR. The portion of the highway within the project area of analysis does not appear to be likely to yield important information in prehistory or history, and does not appear to be significant under Criteria D of the NRHP or Criteria 4 of the CRHR. The segment of the highway in the project area of analysis does not appear to possess sufficient integrity of setting, feeling, materials workmanship and association. Staff therefore recommends that the segment of the US Route 80 in the project area of analysis would not contribute to either the NRHP or CRHR eligibility of the highway as whole, should it ever be determined to be eligible.

Wixon Gravel Mine

Wixon Gravel Mine is an open pit mine, which is an extraction of minerals at the surface of the earth through digging a shallow hole. It is likely associated with the local Wixon family, who farmed in the El Centro area and lived close to the site of the mine. The mine first appears on maps of the area in 1940.

The mine site consists of 3 open pit areas serviced by a packed dirt road. The site has several dirt roads that connect the site with the Evan Hewes Highway (US Route 80). It is likely due to the proximity to the highway that the gravel was probably taken by trucks to nearby road construction sites.

As open pit mining is a relatively simple process, the sand and gravel mining industry has a low data potential in the themes of technology, policy and economy. The Wixon Gravel Mine does not appear to be associated with any of these themes or with the lives of persons significant in our past, and does not meet any of the eligibility criteria set forth in the NRHP or CRHR. Staff therefore recommends that the Wixon Gravel Mine would not to be individually eligible for listing on the NRHP or the CRHR, nor would it be a contributor to an existing and/or proposed archaeological district or landscape.

County Gravel Mine

The County Gravel Mine is an open pit mine, which is an extraction of minerals at the surface of the earth through digging a shallow hole. The Bureau of Land Management’s General Land Office plat map for this township recorded August 5, 1940 as the date of action and October 6, 1995 as the closing date for the mine.

The mine site consists of a complex of open pit areas serviced by a packed dirt road. The site has several dirt roads that connect the site with the Evan Hewes Highway (US Route 80). It is likely due to the proximity to the highway that the gravel was probably taken by trucks to nearby road construction sites.

As open pit mining is a relatively simple process, the sand and gravel mining industry has a low data potential in the themes of technology, policy and economy. The County Gravel Mine does not appear to be associated with any of these themes or with the lives of persons significant in our past, and does not meet any of the eligibility criteria set forth in the NRHP or CRHR. Staff therefore recommends that the County Gravel Mine would not to be individually eligible for listing on the NRHP or the CRHR, nor would it be a contributor to an existing and/or proposed archaeological district or landscape.

C.3.4.4 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Construction Impacts

Excavations

Brush trimming would be conducted between alternating rows of SunCatchers^{TM}. Brush trimming consists of cutting the top of the existing brush while leaving the existing native plant root system in place to minimize soil erosion. After brush has been trimmed, blading for roadways and foundations would be conducted between alternating rows of SunCatchers^{TM} to provide access to individual SunCatchers^{TM}. Blading would consist of removing terrain undulations and would be kept to a minimum. The blading operations would keep native soils within 100 feet of the pre-development location, with no hauling of soils across the site.

Foundations for Power Block and Auxiliary Equipment

The buildings and major structures such as yard tanks would be supported on shallow spread and continuous footings or mat-type foundations.

Solar Arrays

The majority of each SunCatcher^{TM} would be supported by a single metal fin-pipe foundation that is hydraulically driven into the ground. These foundations are expected to be approximately 20 feet long and 24 inches in diameter, with 12-inch-wide fins extending from each side of the pipe pile. Shallow drilled pier concrete foundations of approximately 36 inches in diameter and an embedment depth with a minimum socketed depth into rock of 6 feet would be used for hard and rock-like ground conditions.

Supports for New Transmission Lines

See Cultural Resources Table 9.

Facilities including On-Site and Off-Site Borrow Areas

Deep foundations would be required for heavy items, such as the power transformers at the electrical substation. Two construction staging and laydown areas would be used for the project. A 100-acre construction laydown area that includes a 25-acre construction staging area would be provided east of Dunaway Road. An 11-acre construction laydown area would be provided adjacent to the Main Services Complex.

Both the 25-acre construction staging area east of Dunaway Road and the 11-acre construction laydown area adjacent to the Main Services Complex would contain temporary construction facilities, including site offices, restrooms, meal rooms, conference rooms, storage facilities, and parking and vehicle maintenance and storage areas.

The 11-acre construction laydown area adjacent to the Main Services Complex would also contain a temporary fueling station. An 8-foot-diameter by 13⅓-foot-long diesel fuel storage tank with secondary containment would be temporarily located on a paved surface in this laydown area.

The 100-acre laydown area east of Dunaway Road is nearly level and thus requires little grading. The 11-acre laydown area adjacent to the Main Services Complex is on a gently sloping, rocky area that would require minimum grading and fill operations to create a level area. Pads would be prepared for setting the trailers housing the temporary construction facilities.

Trenching for Buried Linear Facilities (Pipelines, Transmission Lines)

See Cultural Resources Table 9.

Demolition of Structures on the Project Site or Along Linear Facilities

None.

Alterations to Old Substations or Transmission Lines to Upgrade for More Capacity

None.

Addition of New and Incompatible Structures in an Old Neighborhood (even an Industrial One), or in the Rural Setting of an Old Agricultural Landscape, or in an Old Transmission Line Corridor, Affecting the Integrity of Setting and Feeling

The project area is currently an open, undeveloped landscape.

Cultural Resources Table 9
Estimated Disturbed Area Summary*

Project Component Item	Area		Proposed Length
	Construction Disturbance	Operations Permanent Disturbance	
Off-Site Development			
Off-site access road	4.5 acres	3.6 acres	1.3 miles
Off-site transmission line	91.6 acres	Included below	7.6 miles
Tower structures	Included above	1.2 to 1.4 acres	
Waterline and pumping station	8.0 acres	1 acre	3.4 miles
Off-site electrical and communications overhead service	0.3 acre	Included below	539 feet
Poles	Included above	26 square feet	
Subtotal	**104.4 acres**	**4.6 acres**	
On-Site Balance-of-Plant Development			
Construction staging and construction administration area east of Dunaway Road	25 acres	25 acres	
On-site construction laydown	11 acres	11 acres	
Site boundary fence line	29.9 acres	14.9 acres	20.5 miles
Site paved roadways	137.6 acres	137.6 acres	25.2 miles

Project Component Item	Area		Proposed Length
	Construction Disturbance	Operations Permanent Disturbance	
Unpaved perimeter roadways	16.2 acres	16.2 acres	11.2 miles
Main Services Complex, parking and services	14.4 acres	14.4 acres	
Assembly buildings and storage	14 acres	14 acres	
On-Site Wet and Dry Utilities Access			
Water pipeline	8.7 acres	8.7 acres	3.8 miles
On-site electrical and communications overhead service	3.8 acres	3.8 acres	6,914 feet
IVS Project Substation	7.7 acres	5.2 acres	
On-site transmission line	34.1 acres	34.1 acres	2.8 miles
Transmission access road	Included above	4.1 acres	2.8 miles
Transmission tower structures	Included above	0.5 to 0.7 acre	
34.5-kV overhead runs to Solar 2A Substation	4.0 acres	4.0 acres	
Poles	Included above	0.1 acre	
34.5-kV runs to overhead lines	5.2 acres	5.2 acres	
Subtotal	**271.31 acres**	**173.73 acres**	
Solar Field Development = 500 by 1.5-MW Solar Groups*			
North-south access routes	245 acres	245 acres	168 miles
East-west access routes	148.3 acres	148.3 acres	102 miles
Electrical Collection System			
600 V underground	35 acres	35 acres	576 miles
34.5-kV underground	20 acres	20 acres	45 miles
SunCatcher™ Installation			
North-south access/ SunCatcher™	440 acres	440 acres	
East-west access/ SunCatcher™	1,735 acres	1,735 acres	
Subtotal	**2,623.4 acres**	**2,568.4 acres**	
Total Area	**3,000.1 acres**	**2,746.6 acres**	

Source: SES 2008a.

Notes:

*Assumes 750-MW net development of 30,000 SunCatchers™.

During installation of the SunCatchers™, only 50% of the total land would be disturbed. The modularity of the SunCatcher™ design and off-site manufacturing would enable a phased deployment, thereby minimizing the proportion of the overall site that is disturbed at any given time during construction.

The plan site layout minimizes traffic road operations of the project.

kV = kilovolt
MW = megawatt
V = volts

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

The construction of the proposed solar thermal power facility may wholly or partially destroy the majority of the surface archaeological resources in the proposed project area and may wholly or partially destroy other buried archaeological deposits that may be components of project area landforms. The total cultural resources inventory includes approximately 330 individual archaeological sites on the surface of the project area. Efforts are being made to avoid impacts to archaeological resources. The surface sites include both stand-alone resources, groups of resources that fall into the archaeological site types described in the "Historical Significance and the Cultural Resources Inventory" subsection above, and resources that are contributing elements to the archaeological landscapes and districts that are also described in that subsection. Although staff is presently unable to identify precisely which of the different archaeological resources are historically significant and is therefore presently unable to articulate the exact character of the impacts that the construction of the proposed facility would have on such resources, staff does clearly foresee that the construction of the proposed facility would, under both NEPA and CEQA, have a significant effect on the environment and would, under Section 106, have an adverse effect on archaeological resources that are historic properties. The proposed PA would set out procedures whereby staff, the State Historic Preservation Officer, the Advisory Council on Historic Preservation, the applicant, Native American groups, and other interested parties would identify programs and protocols that ensure that significant impacts to the information values of significant archaeological resources would be mitigated. Although the specific programs and protocols do not presently exist, it is possible to describe the performance standards that would be used to ensure that the resolution of significant impacts to historically significant archaeological resources is adequate, as well as the types of measures that can be used to resolve such impacts.

As noted above, the analytical process for cultural resources involves five steps: 1) determination of the geographic extent of the project area of analysis; 2) creation of an inventory of the known cultural resources within that area; 3) assessing the historical significance of those known resources; 4) assessing the impacts of the project on significant resources; and 5) resolving significant impacts on significant cultural resources, and endeavoring to ensure that all significant impacts are mitigated. Energy Commission licensing decisions and BLM right-of-way grant decisions also typically identify the likelihood of encountering previously unknown resources and contain provisions that require specific procedures that ensure that any impacts to these resources can be resolved. Due to the fact that the high number of cultural resources for this project renders the evaluation of all known resources infeasible, staff is recommending that such provisions be extended to those known resources that it is infeasible to evaluate prior to agency decisions.

The PA provides a valuable vehicle for this approach. As noted above, the first step of the analytical process is complete. To complete the second step and acquire the data necessary to complete the third step, the PA would require that the project owner conduct fieldwork to collect the balance of the requisite primary data on the cultural resources in the project area of analysis with which to evaluate their historical significance. This fieldwork would consist of, as appropriate, the collection of further surface and subsurface data on each resource sufficient to develop formal recommendations of historical significance. The fieldwork would consist of a sequence of surface and subsurface phases of investigation. Criteria set out in the Historic Properties Treatment Plans (HPTP) for which the PA provides would guide decisions on the number and extent of the phases needed to investigate the archaeological resource types as set out in subpart II of appendix A to the PA. The application of the thresholds of resource significance and integrity found in subsection C.3.3.3 above would conclude the third step as it relates to archaeological resources. Similarly, the fourth step would involve the assessment of any of the types of impacts to significant historical resources identified in subsection C.3.3.4 above. The fifth and final step, implementing mitigation measures that meet standards for the resolution of significant impacts on significant historical resources and historic properties under CEQA, NEPA, and Section 106, would occur through the joint efforts among the consulting parties to the PA. Common mitigation measures for significant impacts on significant archaeological resources may include, among others, resource avoidance, monitoring by cultural resource professionals and Native American monitors, information recovery, curation of material remains and resource documentation, and public outreach.

The methods that the PA would employ to resolve potentially significant impacts to the full complement of significant cultural resources would vary relative to the values for which the resources are found to be significant. For example, cultural resources that are found to be significant on the basis of their information value, principally archaeological deposits, would be subject to suites of treatments the purposes of which would variably be to actively avoid all or part of subject deposits, to record and preserve representative samples of the unique spatial or associative information that is intrinsic to the depositional history of each deposit, to collect and curate representative samples of material culture assemblages, to provide for the preparation and dissemination of professional technical publications and public interpretative materials, and to develop and implement plans to foster the long-term historic preservation of subject deposits. Archaeological resources in the project area of analysis that may be subject to unique treatment plans, to custom HPTPs may include archaeological landscapes and districts, and archaeological site types, in addition to individual archaeological sites.

The resolution of potentially significant impacts on cultural resources that derive historical significance from values other than information potential is not as straightforward (see “Identification and Assessment of Direct Impacts on Ethnographic Resources and Recommended Mitigation” subsection below). Mitigation options for cultural resources that are significant for different associative values such as association with important events or patterns in prehistory or history, with important persons, or with distinctive construction and design techniques range widely. Specific mitigation measures for such resources would be developed in consultation among agency and public stakeholders in accordance with the processes set out in the PA.

If the proposed action were to potentially affect significant archaeological resources in an adverse manner, one or several HPTPs would be developed in consultation with the consulting parties to the PA. The number and scope of the HPTPs would be dependent on the geographic scope of each proposed subaction and the archaeological character of the resource types in each subject portion of the project area. Any HPTP would stipulate specific mitigation measures that would be implemented during final project design, prior to and during construction, and during the operation of the project. Mitigation measures for adverse impacts to the information values of archaeological resources may include, but are not limited to, the following:

- Physical avoidance of archaeological resources, wherever feasible, through, individually or in combination, project redesign, fencing or other methods of conspicuous demarcation, and monitoring;
- When physical avoidance is infeasible, the recovery of a representative sample of the information for which subject archaeological resources have been found to be significant;
- Professional and public dissemination of the results of data recovery investigations through, among other methods, the presentation of papers at professional conferences, the preparation of literature or film for public release, the development of education modules for public school use, and the development of museum exhibits and attendant catalogs;
- Preparation of applications and formal nomination of significant archaeological resources to the CRHR and the NRHP; and
- Recovery and repatriation of human remains per the Native American Graves Protection and Repatriation Act (NAGPRA) Plan of Action (POA), as set forth in appendix L to the PA.

The performance standard that any such mitigation measure in an HPTP must meet would be that the results of the mitigation effort would be able to evidence the recovery and curation of a representative sample of the information for which each adversely affected archaeological deposit was significant, and to demonstrate efforts to disseminate that information in the public interest.

There are a number of other archaeological resources in the project area of analysis that are and may be significant for their associative values, in addition to their information values. Adverse impacts to these associative values would be addressed as one part of the consultations that would occur under the proposed PA.

The Anza Trail is a resource of national significance for its association with important events in our history and its associations with important persons in our early history, as well as for its information potential. Staff believes that the associative values of the resource require Federal and State agencies to more broadly consider the degree of integrity that the resource, as a whole, must have in order to convey its significance. This means that, in addition to considering how the proposed action would affect the physical integrity of the spatial relationships among any material remains of the use of the trail, the agencies would need to consider whether and how the action would visually degrade the integrity of the setting, feeling, and association of the resource, formal aspects of integrity under both the NRHP and CRHR programs, should further fieldwork ever reveal any such material remains. The National Park Service (NPS), the administrators of the Anza Trail, share this perspective. In a recent letter (NPS 2009a), NPS expresses the belief that the installation of project SunCatchers™ and ancillary facilities would significantly alter the visual landscape around the project area, particularly the views from the Anza Trail corridor and from the nearby accompanying recreational trail. NPS concludes that the proposed action therefore has the potential to degrade the integrity of the historic character of the trail and its related resources in the vicinity of the proposed action. As a consequence, the proposed action has the potential to diminish the ability of the public to experience and understand the historic expedition and the cultural landscape of that period.

Consultation under the proposed PA would potentially provide for a number of measures to investigate the presence or absence of any material remains of the trail, and to address potential degradation to any such remains found and to the visual integrity of the resource. As the proposed action may affect presently unfound or unrecognized material remnants of the use of the trail corridor, identification measures negotiated under subpart I of appendix A and under appendix B to the PA would provide for investigations, such as further close-quarter pedestrian survey, the use of infrared satellite imagery, or the use of light detection and ranging (LIDAR) technology, to evidence a reasonable effort to ensure that no material remains of the use of the trail are in the project area. Similarly, the PA may also provide for the analysis of the project area isolate data to see whether any potential Spanish Colonial era materials may have been found during recent pedestrian surveys but have gone unrecognized to date. While there would not appear to be any way to completely negate the potential loss of integrity to the historic viewshed of the trail, the HPTP developed under the PA for the resource would potentially propose a number of different off-site measures that would help to resolve potential impacts and may mitigate that loss to a less than significant level. The consulting parties to the PA would derive the off-site measures in consultation with one another and refer to the Anza Trail Management and Use Plan for guidance. Should no material evidence of the Anza Trail or activity related to the trail's use be found, the designated trail corridor and the driving routes designated for the trail's interpretation, BLM Roads 274 and 243, would most likely not qualify for further consideration under either the NRHP or CRHR programs, because there would be no physical cultural resource present. Under such circumstances, the Anza Trail would not qualify for further consideration as, respectively, a historic property or a historical resource for the purpose of compliance with NEPA, Section 106, or CEQA. At that point, the further consideration of the potential impacts of the proposed action on the Anza Trail and on the interpretative driving routes, and the development of any requisite mitigation would occur exclusively in the context of the visual resource and land use analyses (see Visual Resources, and Land Use, Recreation and Wilderness sections).

Other archaeological resources that are found to be significant on the basis of values beyond or in addition to their information value would be subject to treatment measures that more appropriately reflect the unique character of those other values. One resource type in the project area of analysis that falls into this category is Native American cremations (see "Southwest Lake Cahuilla Shoreline Archaeological District" subsection, above). The cremations are likely to be found eligible for the NRHP for both their information and associative values. Additionally, discovery and treatment of Native American remains is subject to compliance with the requirements of the Native American Graves Protection and Repatriation Act (NAGPRA). Although only one cremation is presently known to occur in the project area and would potentially be subject to direct physical disturbance, the balance of the known cremations just to the east of the present project area boundary would be subject to the direct visual intrusion of project SunCatchers™. The visual intrusion of the project on the actual cremations and on the lands among them, which the Quechan appear to conceive of together as the cultural resource type, would critically degrade the ability of that resource type to convey its significance. This visual intrusion may, therefore, be a significant effect that requires resolution. Stakeholders in the PA process would discuss a requirement that the known cremation zone be re-surveyed to more firmly establish a zone boundary, to reach stakeholder consensus on the width of a visual buffer for the zone, and to set aside the area that encompasses the zone and the buffer as a no-build zone, perhaps as a part of a formal BLM special designation area that would continue to the north and south of the project area along the lateral contact between the Fan Aprons and Beach Zone landforms. The actual resolution of impacts to resources in this category would be determined in consultation with all the consulting parties and incorporated into the Programmatic Agreement (see “Identification and Assessment of Direct Impacts on Ethnographic Resources and Recommended Mitigation” subsection below for further discussion).

Staff has been involved in the implementation of contingency plans adopted in past siting cases, as well as in the implementation of PAs and finds that if they include the types of mitigation measures and performance standards identified throughout the “Assessment of Impacts and Discussion of Mitigation” subsection, they can be effective in identifying and evaluating cultural resources and mitigating potential impacts to those resources. Staff anticipates that the PA will be executed prior to the decision on this application. Even without a final PA, staff is confident that a condition of certification that requires the types of mitigation measures and the performance standards identified throughout this subsection would ensure that all significant impacts to the information values of archaeological resources can be resolved or mitigated to a level that is less than significant, and that all other significant impacts to the associative values of archaeological and ethnographic resources can be meaningfully reduced.

Identification and Assessment of Direct Impacts on Ethnographic Resources and Recommended Mitigation

No NRHP- or CRHR-eligible ethnographic resources are presently ascribed to the project area of analysis. Further refinements under the PA to determinations of the historical significance and to extant assessments of the potential for visual impacts to occur to other ethnographic resources known to be in the vicinity of the project area would facilitate the conclusion of assessments as to whether the construction of the project would adversely affect significant ethnographic resources.

Historic Properties Treatment Plans (HPTP) for which the PA provides are to contain the exact measures that are to mitigate the adverse impacts of the proposed action on any ethnographic resources in the project area of analysis that are found to be significant and determined to be historical resources. The PA (Appendix B) provides explicit mitigation measures for three types of ethnographic resources in the project area of analysis and includes performance standards for each measure. The three resource types are cremations or burial sites, trails, and physiographic landforms and other geographic or constructed places to which Native American groups ascribe religious or cultural significance.

Cremations and Burial Sites

The preferred mitigation measure for a cremation or burial site is avoidance, whether the purpose of the measure is to mitigate impacts to such a resource’s information value as an archaeological resource or its associative value as an ethnographic resource. Avoidance of this resource type as an ethnographic resource must entail considerations of both the physical and visual impacts that the proposed action would potentially have on such resources. Specific measures to avoid physical impacts to cremation or burial sites may include, individually or in combination, project redesign, fencing or other methods of conspicuous demarcation, and monitoring. The performance standard that any such mitigation measure in an HPTP must meet would be that one would be able to reasonably anticipate that its implementation would in fact avoid physical impacts to cremations and burial sites during project construction. Where physical avoidance of cremations or burial sites is infeasible, the mitigation measure for any such adverse effect, whether to the information or associative values of a cremation or burial site, would be the implementation of the of the NAGPRA POA that is appendix L to the proposed PA. The performance standards that the POA must meet would be close adherence to the Native American consultation protocols set out in the POA. The derivation of and the adherence to the measures that would satisfy these standards is not, however, straightforward.

Any mitigation measure that one would derive to ameliorate either the physical or the visual impacts of the proposed action on the associative values that pertain to cremations and burial sites would have to address, at a minimum, how one bounds such resources relative to their associative values, and what the width of the buffer zones would need to be to effectively mitigate the adverse visual impacts. These are questions that, by their nature, must be resolved in the context of consultation with the people to whom the cremations and burial sites are important, in a stricter regulatory sense, the people for whom the resources have associative value. Obviously, the people in question here are Native Americans who attribute the human remains on and near the project area to their ancestors.

The question of how one is to bound cremations and burial sites is one example of the necessity for Native American consultation on the treatment of these resources. A Euroamerican cultural resources professional who understands the potential significance of a cremation or burial site to be primarily in its potential information value would most probably demarcate the physical boundary of such a resource on the basis of the physical extent of the human remains, the physical evidence of the place and manner of the original disposition of the remains, and the physical extent of evident associated material culture and anthropogenic sediments. A Native American descendant of a person whose remains compose, in part, a cremation or burial site may demarcate the boundary of the resource to include the subject cremation or burial site and a swath of land around it which had become sacred, in conjunction with the cremation or burial ceremony, for the association of that land with the deceased. The associative value of the resource for that hypothetical Native American descendant would therefore extend beyond the physical extent of the subject cremation or burial to adjacent ground. That Native Americans involved to date in consultations on the proposed action have such a perspective on cremations and burial sites is unmistakable. Preston Arroweed, a Quechan elder, spoke at the December 4, 2009 kick-off meeting for the PA and related that the Quechan and other Native American people in the region still practice cremation (McGuirt 2009). He told the participants that the present practice is often to burn the deceased and some of their possessions, and then shallowly bury the remains so that the wind can carry their ashes away. Thereafter, that cremation ground is held as sacred for all time.

Native American consultation would also be necessary to try and establish the extent of visual buffers around cremations and burial sites sufficient to mitigate probable degradations to the integrity of each such resource, particularly resource setting, feeling, and association. The consultation issue here would be how far away from a cremation or burial site a group of SunCatchers™ would have to be to reduce the visual impact of that equipment, under CEQA, to less than significant, or, under Section 106, to resolve any potential adverse effect. The resolution of this issue and the subsequent derivation of mitigation measures for it may prove a challenge to achieve.

Specific measures to avoid visual impacts to the associative values of cremations or burial sites may include, individually or in combination, project redesign, the demarcation and enforcement of no-build zones, or visual screening. (Staff does acknowledge that the design of seamless visual screening in the open desert environment that is typical of the project area is improbable.) The performance standard that any such mitigation measure in an HPTP must meet would be that one would be able to reasonably argue, on the basis of extensive consultation with potential Native American descendents of the cremated or buried people, that the implementation of the proposed action would not cause, under CEQA, a substantial adverse change in the significance of an historical resource, or, under Section 106, would not alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Staff concludes that this performance standard is a test that no mitigation measure negotiated under the PA is likely to meet. The adoption and implementation of **CUL-1** may lessen the visual effect of the proposed action on significant cremations and burial sites in and near the project area, but the effect would probably remain significant. This particular effect may therefore be unmitigable.

Trails or Trail Segments

The trails, or more accurately, trail segments in the project area of analysis are typically discontiguous sections of what were presumably coherent prehistoric trail networks that ran through what is now the proposed project site. The segments are found on the ground both with and without associated material culture remains. The preferred mitigation measure for the trail segments is avoidance, whether the purpose of the measure is to mitigate impacts to such a resource's information value as an archaeological resource or its associative value as an ethnographic resource. Avoidance of this resource type as an ethnographic resource must entail considerations of both the physical and visual impacts that the proposed action would potentially have on it. Specific measures to avoid physical impacts to significant trail segments may include, individually or in combination, project redesign, fencing or other methods of conspicuous demarcation, and monitoring. The performance standard that any such mitigation measure in an HPTP must meet would be that one would be able to reasonably anticipate that its implementation would in fact avoid physical impacts to the trail segments during project construction. Where physical avoidance of trail segments is infeasible, specific mitigation measures developed for an HPTP may include the execution of a trail network study the purpose of which would be to determine the nature and former extent of trails beyond the APE. Such measures may also include the consideration of the extant trail segments within the context of the preparation of a formal Historic American Landscape Survey (HALS). The performance standards that any such mitigation measure in an HPTP must meet would be that the implementation of the measure led to the recovery of the information for which subject trail segments were significant and thereby also mitigate for the loss of the ability of a resource to convey its associative values. For each trail segment, that information would include the description and interpretation of the individual segment, and an analysis of the broader potential trail network context for that segment.

Beyond the physical avoidance of significant trail segments, consideration may also need to be given to potential adverse visual impacts that the proposed action may have on the associative values that Native American groups may ascribe to such segments. Native American consultation would also be necessary here to try and establish the extent of visual buffers around trail segments sufficient to mitigate probable degradations to the integrity of each such resource, particularly resource setting, feeling, and association. The consultation issue here would be how far away from a significant trail segment a group of SunCatchers™ would have to be to reduce the visual impact of that equipment, under CEQA, to less than significant, or, under Section 106, to resolve any potential adverse effect. The resolution of this issue and the subsequent derivation of mitigation measures for it may prove a challenge to achieve here as well.

Specific measures to avoid visual impacts to the associative values of trail segments may include, individually or in combination, project redesign, the demarcation and enforcement of no-build zones, or visual screening. (Staff does acknowledge here as well that the design of seamless visual screening in the open desert environment that is typical of the project area is improbable.) The performance standard that any such mitigation measure in an HPTP must meet would be that one would be able to reasonably argue, on the basis of extensive consultation with Native American groups, that the implementation of the proposed action would not cause, under CEQA, a substantial adverse change in the significance of an historical resource, or, under Section 106, would not alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Staff concludes that this performance standard is a test that no mitigation measure negotiated under the PA is likely to meet. The adoption and implementation of **CUL-1** may lessen the visual effect of the proposed action on significant trail segments in and near the project area, but the effect would probably remain significant. This particular effect may therefore also be unmitigable.

Physiographic Landforms and other Geographic or Constructed Places

The third type of ethnographic resource for which the PA provides explicit mitigation measures (Appendix B) encompasses a broader group of resources. This type includes physiographic landforms and other geographic or constructed places. "Physiographic landforms" refers to natural landscape features that Native American groups imbue with religious or cultural significance. The landforms would typically be those, such as prominent mountains or valleys, that readily lend themselves to cross-cultural recognition. Geographic places can be more nuanced features of the landscape the delineation of which may be emic cultural constructs that are not necessarily apparent to outside observers. Constructed places would include man-made features such as geoglyphs and cleared desert pavement circles that are most often typed as archaeological resources, but to which many Native American groups ascribe associative value. The preferred mitigation measure for these resources is avoidance and the maintenance of existing access to these resources. Avoidance of the resources of this type must entail considerations of both the physical and visual impacts that the proposed action would potentially have on them. Specific measures to avoid physical impacts to significant resources of this type may include, individually or in combination, project redesign, fencing or other methods of conspicuous demarcation, and monitoring. The performance standard that any such mitigation measure in an HPTP must meet would be that one would be able to reasonably anticipate that its implementation would in fact avoid physical impacts to any such resources during project construction. Where physical avoidance of them is infeasible, specific mitigation measures developed for an HPTP to ameliorate significant physical impacts to the associative values of the resources may include the preparation and dissemination of ethnographic investigations that would augment the extant documentation of the cultural contexts that impart meaning to the degraded resources, and the collection of high quality images of the resources prior to their degradation. The performance standards that any such mitigation measure in an HPTP must meet would be that the implementation of the measure led to the production of information that may mitigate for the loss of the ability of a resource to convey its associative values. For each physiographic landform, or geographic or constructed place, that information would include the description and interpretation of the resource itself, and an analysis of the broader cultural context relative to which that resource had meaning.

Beyond the physical avoidance of physiographic landforms, or geographic or constructed places, consideration also needs to be given to potential adverse visual impacts that the proposed action may have on the associative values that Native American groups may ascribe to such resources. Native American consultation would also be necessary here to try and establish the extent of visual buffers around each resource sufficient to mitigate probable degradations to the integrity of each, particularly resource setting, feeling, and association. The consultation issue here would be how far away from a significant physiographic landform, or geographic or constructed place a group of SunCatchers™ would have to be to reduce the visual impact of that equipment, under CEQA, to less than significant, or, under Section 106, to resolve any potential adverse effect. The resolution of this issue and the subsequent derivation of mitigation measures for it may prove a challenge to achieve here again as well.

Specific measures to avoid visual impacts to the associative values of physiographic landforms, or geographic or constructed places may include, individually or in combination, project redesign, the demarcation and enforcement of no-build zones, or visual screening. Staff does acknowledge here as well that the design of seamless visual screening in the open desert environment that is typical of the project area is improbable. Given, however, that a number of the ethnographic resources of this type are far beyond the project area, the design of potential visual screening would include consideration of the efficacy of orienting SunCatchers™ to minimize glare, or erecting screens to reduce or eliminate glare. The performance standard that any such mitigation measure in an HPTP must meet would be that one would be able to reasonably argue, on the basis of extensive consultation with Native American groups, that the implementation of the proposed action would not cause, under CEQA, a substantial adverse change in the significance of an historical resource, or, under Section 106, would not alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Staff concludes that this performance standard is a test that no mitigation measure negotiated under the PA is likely to meet. The adoption and implementation of **CUL-1** may lessen the visual effect of the proposed action on physiographic landforms, or geographic or constructed places in and near the project area, but the effect would probably remain significant. This particular effect may therefore also be unmitigable.

Identification and Assessment of Direct Impacts on Built-environment Resources and Recommended Mitigation

Whereas determinations regarding NRHP- or CRHR-eligibility of built-environment resources within the project area of analysis have not been completed, identification and assessment of impacts cannot be assessed at this time. Given the relatively complete investigation of that area and the dearth of historically significant built-environment resources found, it appears to be unlikely that the construction-related ground disturbance of the project area would directly impact built-environment resources that would qualify as historical resources under CEQA.

Identification and Assessment of Indirect Impacts and Recommended Mitigation

There is potential for indirect impacts to sites in the exclusion area especially due to increased traffic during construction and due to visual impacts as described above for cremation and burial sites. It is also plausible that project area grading could increase the amount of sheet wash and erosion during heavy rainfall and indirectly cause damage to sites outside the project area. The specific mitigation measure for these potential indirect impacts would be the completion and implementation of the Monitoring and Discovery Plan that, in draft form, is appendix J to the PA. The performance standards that the Monitoring and Discovery Plan must meet would be that the implementation of the plan would ensure the ready identification and neutralization of any indirect impacts that the construction of the proposed project may cause.

Operation Impacts

Many of the potential impacts described above as part of construction would also apply to the operation of the proposed facility, once built. During the operation of the proposed power plant, repair of a buried utility or other buried infrastructure could require the excavation of a large hole. So such repairs have the potential to impact previously unknown subsurface archaeological resources in areas unaffected by any original trench excavation. The specific mitigation measure for the potential impacts of the operation of the proposed facility on significant cultural resources would be the completion and implementation of the Historic Properties Management Plan (HPMP) that, in conceptual form, is appendix C to the PA. The performance standards that the HPMP must meet would be that the implementation of the plan would ensure the timely consideration and resolution of any significant impacts to significant cultural resources that may arise as a result of the operation of the proposed facility.

Project Closure and Decommissioning

There-excavation and removal of SunCatchers™ and other ancillary facility infrastructure has the potential to significantly affect significant cultural resources. The specific mitigation measure for the potential impacts of facility decommissioning and closure would be the completion and implementation of the Historic Properties Management Plan (HPMP) that, in conceptual form, is appendix C to the PA. The performance standards that the HPMP must meet would be that the implementation of the plan would ensure the substantive consideration and resolution of any significant impacts to significant cultural resources that would arise during the decommissioning and closure of the proposed facility.impacts

C.3.5 300 MW ALTERNATIVE

C.3.5.1 SETTING AND EXISTING CONDITIONS

The setting and existing condition of the 300 MW alternative are the same as Phase 1 of the proposed project. Please refer to subsection C.3.4.1 in discussion of the proposed action.

Regional Setting

The regional setting of the 300 MW alternative is the same as Phase 1 of the proposed project. Please refer to subsection C.3.4.1 in discussion of the proposed action.

Project, Site, and Vicinity Description

Please refer to the 300 MW Phase description described previously as part of the overall proposed action in subsection C.3.4.1. The project area lands are currently administered by the BLM on behalf of the public. Twelve thousand (12,000) SunCatchers™ would be configured into 200 1.5-MW solar groups of 60 SunCatchers™ per group that would have a net capacity of 300 MW. The 300 MW solar field would be constructed on 2,577 acres. An 11-acre lay-down area within this area is proposed. Additionally, a 25-acre main services complex and a 6-acre substation would be constructed in association.

Environmental Setting

Please refer to "Environmental Setting" subsection C.3.4.1 for proposed action.

Cultural Setting

Please refer to "Cultural Setting" subsection C.3.4.1 for proposed action.

Cultural Resources Inventory

A records search was performed by URS. Please refer to the Cultural Resources Inventory for the proposed action. 30 sites have been identified as part of the 25 % re-survey and recorded in the project area of analysis for the alternative and are presented in Cultural Resources Table 10 below.

Cultural Resources Table 10
Cultural Resources Sites in 300 MW Alternative
(25**%** Sample)

Temporary Site No.	Site Type	Cultural Context	Potential for Buried Deposits Based on Geomorphologic Information	Project Feature
DRK-002	Lithic Scatter	Prehistoric	Low	300 MW Alternative
DRK-004	Lithic Scatter Historic Survey Marker	Prehistoric Historic	Low	300 MW Alternative
DRK-005	Lithic Scatter	Prehistoric	Low	300 MW Alternative
DRK-010	Lithic Scatter Historic Survey Marker Historic Refuse	Prehistoric Historic	Low	300 MW Alternative
DRK-011	Lithic Scatter	Prehistoric	Low	300 MW Alternative
DRK-020	Historic Survey Marker Historic Bullet	Historic	Low	300 MW Alternative
DRK-047	Lithic Scatter	Prehistoric	Low	300 MW Alternative
DRK-139	Lithic Scatter	Prehistoric	Medium to High	300 MW Alternative
DRK-140	Lithic Scatter	Prehistoric	Medium to High	300 MW Alternative
DRK-141	Lithic Scatter Fire-Affected Rock / Hearth	Prehistoric	Medium to High	300 MW Alternative
DRK-146	Historic Refuse	Historic	Medium to High	300 MW Alternative
EBR-010A	Ceramic Scatter	Prehistoric	Low	300 MW Alternative
EBR-020	Lithic Scatter	Prehistoric	Low	300 MW Alternative
EBR-023	Lithic Scatter	Prehistoric	Low	300 MW Alternative
EBR-065	Lithic Scatter	Prehistoric	Low	300 MW Alternative
JF-006	Historic Refuse Rock Cluster	Historic	Low	300 MW Alternative
JF-030	Historic Refuse	Historic	Medium to High	300 MW Alternative
JFB-010	Historic Survey Marker	Historic	Low	300 MW Alternative

Temporary Site No.	Site Type	Cultural Context	Potential for Buried Deposits Based on Geomorphologic Information	Project Feature
RAN-022	Lithic Scatter Historic Refuse Gravel Mining	Prehistoric Historic	Low	300 MW Alternative
RAN-025	Lithic Scatter	Prehistoric	Low	300 MW Alternative
RAN-412C	Lithic Scatter Ceramic Scatter Fire-Affected Rock / Hearth Animal Bone	Prehistoric	Medium to High	300 MW Alternative
RAN-412F	Lithic and Ceramic Scatter Groundstone	Prehistoric	Medium to High	300 MW Alternative
RAN-419	Lithic Scatter Fire-Affected Rock	Prehistoric	Medium to High	300 MW Alternative
RAN-424	Lithic and Ceramic Scatter Fire-Affected Rock / Hearth Groundstone	Prehistoric	Medium	300 MW Alternative
RAN-426	Lithic Scatter	Prehistoric	Medium	300 MW Alternative
RANA-003	Historic Bomb Crater	Historic	Low	300 MW Alternative
SM-003	Lithic Scatter	Prehistoric	Low	300 MW Alternative
T-05	Historic Trail	Historic	Low	300 MW Alternative
T-17	Prehistoric Trail	Prehistoric	Low	300 MW Alternative
T-42	Prehistoric Trail	Prehistoric	Low	300 MW Alternative

C.3.5.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

A. Identification analysis is based on the three following observations:

1. Whereas testing has not been completed, a subset of sites will qualify for the NRHP and CRHR.
2. Given the high quantity and density of cultural resources present, cultural resources cannot be completely avoided by project construction.
3. The potential exists for buried archaeological deposits.

B. The alternative is anticipated to have the following impacts/impacts:

1. Significant effect per NEPA.
2. Significant impact per CEQA.
3. Adverse effect per Section 106 of the NHPA.

When resource evaluations have been completed, impacts will be assessed. The observation and identification of 30 cultural resources thus far, including prehistoric trails, as part of the 25% re-survey suggests extensive use of the project landform in the past. If impacts are deemed significant, mitigation measures would be stipulated and refined in a Programmatic Agreement negotiated among all consulting parties and executed by the BLM.

Laws, Ordinances, Regulations, and Standards Applicable to the 300 MW Alternative

Please refer to subsection C.3.3.6 for proposed action.

C.3.5.3 CUMULATIVE IMPACTS

This alternative would result in the conversion of 2,602 acres of undeveloped open space with an industrial utility use. When compared to the proposed action, this alternative would result in approximately 60% less land conversion to industrial uses. However, the cumulative impacts of this amount of land conversion along with all other existing, planned, and proposed projects would result in adverse cumulative land conversion.

C.3.6 DRAINAGE AVOIDANCE #1 ALTERNATIVE

The first of two alternatives developed to reduce impacts to the waters of the U.S. would prohibit permanent impacts within the 10 primary drainages within the proposed project boundaries. This alternative would have the same outer project boundaries as the proposed action, but it would include prohibition of installing permanent structures within drainages, thereby reducing the available acreage for development to 4,690 acres.

C.3.6.1 SETTING AND EXISTING CONDITIONS

This alternative would exclude primary drainages located throughout the proposed project site, which would decrease the amount of land converted to an industrial use. Nonetheless, as this alternative would have the same outer project boundaries as the proposed action, the environmental setting would be the same as the proposed action.

Environmental Setting

Please refer to "Environmental Setting" subsection for proposed action.

Cultural Setting

Please refer to "Cultural Setting" subsection for proposed action.

Cultural Resources Inventory

A records search was performed by URS. Please refer to the Cultural Resources Inventory for the proposed action. Seventy-four sites have been identified as part of the 25 % re-survey and recorded in the project area of analysis for the alternative and are presented in Table 11. Site descriptions are provided in Table 7.

Cultural Resources Table 11
Cultural Resources in Project Area of Analysis for Alternative 2
(25**%** Sample)

Archaeological Sites					
DRK-002	DRK-140	EBR-092	JFB-010	JMR-012	RAN-061
DRK-004	DRK-141	EBR-095	JM-001	LL-018	RAN-081
DRK-005	DRK-146	EBR-096	JM-005	LL-019	RAN-412C
DRK-010	EBR-010A	EBR-100	JM-008	RAN-006	RAN-412F
DRK-011	EBR-020	EBR-102	JM-009	RAN-008	RAN-419
DRK-020	EBR-023	EBR-106	JM-020	RAN-012	RAN-424
DRK-023	EBR-065	EBR-218	JM-026	RAN-015	RAN-426
DRK-027	EBR-070	EBR-222	JM-029	RAN-018	RANA-003
DRK-029	EBR-072	JF-005	JM-030	RAN-024	SM-003
DRK-032	EBR-079	JF-006	JM-042	RAN-025	T-03
DRK-047	EBR-080	JF-030	JMR-004	RAN-034H	T-05
DRK-139	EBR-083	JFB-004	JMR-008	RAN-057	T-17
T-42	T-42				

C.3.6.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

A. Identification analysis is based on the three following observations:

1. Whereas testing has not been completed, a subset of sites will qualify for the NRHP and CRHR.
2. Given the high quantity and density of cultural resources present, cultural resources cannot be completely avoided by project construction.
3. The potential exists for buried archaeological deposits.

B. The alternative is anticipated to have the following impacts/impacts:

1. Significant effect per NEPA.
2. Significant impact per CEQA.
3. Adverse effect per Section 106 of the NHPA.

A PA would be drafted and negotiated among all consulting parties, including interested Tribes. The agreement would stipulate the development of treatment plans, including the refinement and definition of mitigation measures.

Laws, Ordinances, Regulations, and Standards Applicable to Drainage Avoidance #1 Alternative

Please refer to appropriate subsection for proposed action.

C.3.6.3 CUMULATIVE IMPACTS

This alternative would result in the conversion of 4,690 acres of undeveloped open space with an industrial utility use. When compared to the proposed action, this alternative would result in approximately 28 % less land conversion to industrial uses.

However, the cumulative impacts of this amount of land conversion along with all other existing, planned, and proposed projects would result in adverse cumulative land conversion.

C.3.7 DRAINAGE AVOIDANCE #2 ALTERNATIVE

The Drainage Avoidance #2 alternative would eliminate both the eastern and western-most portions of the proposed action, where the largest drainage complexes are located. It would reduce the overall size of the project site by 3,347 acres (from 6,500 acres to 3,153 acres). In this alternative, permanent structures would be allowed within all drainages inside the revised project boundaries.

C.3.7.1 SETTING AND EXISTING CONDITIONS

This alternative would exclude segments of land located throughout the proposed project site, which would decrease the amount of land converted to an industrial use. Please see the discussion of existing conditions within affected BLM lands under Section C.8.4.1.

Environmental Setting

Please refer to “Environmental Setting” subsection C.3.4.1 for proposed action.

Cultural Setting

Please refer to “Cultural Setting” subsection C.3.4.1 for proposed action.

Cultural Resources Inventory

A records search was performed by URS. Please refer to the Cultural Resources Inventory for the proposed action. Thirty-seven sites have been identified as part of the 25 % re-survey and recorded in the project area of analysis for the alternative and are presented in Table 12. Site descriptions are provided in Table 7.

Cultural Resources Table 12
Cultural Resources in Project Area of Analysis for Alternative 3
(25**%** Sample)

Archaeological Sites		
RAN-005	EBR-023	RAN-015
DRK-032	EBR-065	RAN-022
RAN-018	EBR-100	DRK-010
RAN-034H	RAN-025	DRK-027
EBR-096	RAN-006	DRK-029
DRK-020	RAN-012	SM-003
DRK-002	JF-006	EBR-095
DRK-004	RAN-024	EBR-102
DRK-011	JF-005	JFB-010
DRK-023	DRK-005	T-17
DRK-047	RAN-008	T-42

Archaeological Sites		
EBR-010A	JFB-004	T-03
EBR-020		

C.3.7.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

A. Identification analysis is based on the three following observations:

1. Whereas testing has not been completed, a subset of sites will qualify for the NRHP and CRHR.
2. Although the quantity of cultural resources present is reduced in comparison to the specific area for Drainage Avoidance #1 Alternative, cultural resources cannot be completely avoided by project construction as part of consideration and implementation of this alternative.
3. The potential exists for buried archaeological deposits.

B. The alternative is anticipated to have the following impacts/impacts:

1. Significant effect per NEPA.
2. Significant impact per CEQA.
3. Adverse effect per Section 106 of the NHPA

A PA would be drafted and negotiated among all consulting parties, including interested Tribes. The agreement would stipulate the development of treatment plans, including the refinement and definition of mitigation measures.

Laws, Ordinances, Regulations, and Standards Applicable to Drainage Avoidance #2 Alternative

Please refer to subsection C.3.3.6 for proposed action.

C.3.7.3 CUMULATIVE IMPACTS

This alternative would result in the conversion of 3,153 acres of undeveloped open space with an industrial utility use. When compared to the proposed action, this alternative would result in approximately 51 % less land conversion to industrial uses, and the cumulative impacts of this amount of land conversion along with all other existing, planned, and proposed projects would result in adverse impacts resulting from cumulative land conversion. The potential combined development of approximately 1 million acres of land in the southern California desert would all combine to result in adverse impacts on cultural resources.

C.3.8 NO ACTION ALTERNATIVE

There are three No Project/No Action Alternatives evaluated in this section, as follows:

NO PROJECT/NO ACTION ALTERNATIVE #1:

No Action on Imperial Valley Solar Project Application and on CDCA Land Use Plan Amendment

Under this alternative, the proposed IVS Project would not be approved by the Energy Commission and BLM and the BLM would not amend the CDCA Plan. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Land Use Plan of 1980, as amended.

Because there would be no amendment to the CDCA Plan and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no new ground disturbance. As a result, no loss or degradations to cultural resources from construction or operation of the proposed project would 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 requiring a land use plan amendment. In addition, in the absence of this project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would have similar impacts in other locations.

NO PROJECT/NO ACTION ALTERNATIVE #2:

No Action on Imperial Valley Solar Project and Amend the CDCA Land Use Plan to Make the Area Available for Future Solar Development

Under this alternative, the proposed IVS Project would not be approved by the Energy Commission and BLM and BLM would amend the CDCA Land Use Plan of 1980, as amended, to allow for other solar projects on the site. As a result, it is possible that another solar energy project could be constructed on the project site.

Because the CDCA Plan would be amended, it is possible that the site would be developed with a different solar technology. As a result, ground disturbance would result from the construction and operation of the solar technology and would likely result in a loss or degradation to cultural resources. Different solar technologies require different amounts of grading and maintenance; however, it is expected that all solar technologies require some grading and ground disturbance. As such, this No Project/No Action Alternative could result in impacts to cultural resources similar to the impacts under the proposed project.

NO PROJECT/NO ACTION ALTERNATIVE #3:

No Action on Imperial Valley Solar Project Application and Amend the CDCA Land Use Plan to Make the Area Unavailable for Future Solar Development

Under this alternative, the proposed IVS Project would not be approved by the Energy Commission and BLM and the BLM would amend the CDCA Plan to make the proposed site unavailable for future solar development. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Land Use Plan of 1980, as amended.

Because the CDCA Plan would be amended to make the area unavailable for future solar development, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no corresponding land disturbance. As a result, the cultural resources of the site are not expected to change noticeably from existing conditions and, as such, this No Project/No Action Alternative would not result in impacts to cultural resources. However, in the absence of this project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would have similar impacts in other locations.

C.3.9 CUMULATIVE IMPACTS

Section B.3, Cumulative Scenario, provides detailed information on the potential cumulative solar and other development projects in the project area. Together, these projects comprise the cumulative scenario which forms the basis of the cumulative impact analysis for the proposed project. In summary, these projects are:

- Renewable energy projects on BLM, State, and private lands, as shown on **Cumulative Figures 1 and 2** and in **Cumulative Tables 1A and 1B.** Although not all of those projects are expected to complete the environmental review processes, or be funded and constructed, the list is indicative of the large number of renewable projects currently proposed in California.
- Future development projects in the immediate Plaster City area are shown on **Cumulative Impacts Figure 3, Plaster City Existing and Future/Foreseeable Projects, and Cumulative Tables 2 and 3**. Table 2 presents existing projects in this area and Table 3 presents future foreseeable projects in the Plaster City Area. Both tables provide the project names, types, locations and statuses

These projects are defined within a geographic area that has been identified by the Energy Commission and BLM as covering an area large enough to provide a reasonable basis for evaluating cumulative impacts for all resource elements or environmental parameters. Most of these projects have, are, or will be required to undergo their own independent environmental review under CEQA and/or NEPA. Even if the cumulative projects described in Section B.3 have not yet completed the required environmental processes, they were considered in the cumulative impacts analyses in this document.

Geographic Scope of Analysis

The geographic area considered for cumulative impacts on cultural resources is the IVS Project area (Plaster City area).

Impacts of Past and Present Projects

For this analysis, the following projects or developments are considered most relevant to impacts on cultural resources (refer also to Section B.3, Table 2):

- United States Naval Air Facility El Centro – West Mesa
- Recreation Activities – BLM West Mesa FTHL Management Area
- Recreation Activities – BLM Yuha Basin ACEC
- U.S. Gypsum Mining – Plaster City
- California State Prison, Centinela – 2302 Brown Road, Imperial, CA
- Recreation Activities – BLM, Superstition Mountain and Plaster City Open Area

Cultural resources in the geographic area have been impacted by past and currently approved projects as follows:

1. Because cultural resources are non-renewable, the removal or destruction of any resource results in a net loss of resources

2. Existing development in the Plaster City area and the surrounding areas has resulted in the removal or destruction of cultural resources, which has resulted in a net loss of resources in these areas

Impacts of Reasonably Foreseeable Future Projects

Cultural resources are also expected to be affected by the following reasonably foreseeable future projects as follows (refer also to Section B.3, Table 3):

Mount Signal Solar Power Station
Green Path
Wind Zero – Training Facility
Atlas Storage Facility
Mixed-use Development
Mixed-use Development
Mixed-use Development
Update General Plan
Update Park Master Plant
Mixed-use Development
Mixed-use Development
Mixed-use Development
Mixed-use Development
Sunrise Powerlink Project
Ocotillo Express Wind Facility
Pedestrian Fence 225 and Pedestrian Fence 70
Mixed Use -Recreation
West-wide Energy Corridor
Seeley Waste Water Treatment Facility Upgrade

Contribution of the Imperial Valley Solar Project to Cumulative Impacts

Construction. The construction of the IVS Project is expected to result in permanent adverse impacts related to the removal and/or destruction of cultural resources on the project site during ground disturbance and other construction activities. It is also expected that the construction of some or all of the foreseeable cumulative projects which are not yet built may also result in the permanent adverse impacts as a result of the removal and/or destruction of cultural resources on the sites for those projects. As a result, the construction of the IVS Project and other foreseeable cumulative projects will contribute to permanent long-term adverse impacts as a result of the removal or destruction of resources on those sites and an overall net reduction in cultural resources in the area.

Operation. During operation of the IVS Project, cultural resources on and in the immediate vicinity of the project site may experience increased vandalism as a result of improved access to the project site, illegal collection of artifacts, or destruction of resources by vehicles traveling on the site. Similar impacts may also occur as a result of some or all of the cumulative projects, as more people come into this area associated with those new land uses. As a result, the IVS Project and the other cumulative projects may contribute to a cumulative adverse impact on cultural resources as a result of increased access to the area and the potential for increased vandalism, illegal collection of artifacts, or destruction of resources during operation related activities.

Decommissioning. The decommissioning of the IVS Project may result in adverse impacts to cultural resources as a result of ground disturbance, increased vandalism, illegal collection of artifacts, or destruction of resources by vehicles traveling on the site during demolition and removal of the project facilities. Similar impacts are not anticipated as a result of most of the other cumulative projects as the removal of those land uses may not result in increased vandalism, illegal collection of artifacts, and/or destruction of resources by vehicles traveling on those sites during demolition and removal of those land uses. As a result, decommissioning the IVS Project is not anticipated to contribute to a cumulative adverse impact on cultural resources beyond the contribution of the project that would occur as a result of the construction and operation of the project.

C.3.10 COMPLIANCE WITH LORS

If Condition of Certification **CUL-1** is properly implemented, the proposed IVS Project would result in a less than significant impact under CEQA and resolve impacts under Section 106 of the NHPA on the information values of known and newly found archaeological resources. The project would, in this limited regard, be in compliance with the applicable state laws, ordinances, regulations, and standards (LORS) listed in Cultural Resources Table 1.

The County of Imperial’s General Plan has general language promoting the county-wide preservation of cultural resources. As **CUL-1** requires specific actions not just to promote but to effect historic preservation and mitigate significant impacts to the information values of archaeological resources, CEQA compliance related to at least these values would be anticipated.

The implementation of **CUL-1** would not ensure compliance with applicable LORS, as they apply to ethnographic resources. Adherence to the consultation processes for which **CUL-1** provides may help narrow apparent differences in cross-cultural perspectives on the character, the significance, and the ultimate treatment of these resources, but those consultations are not likely to reduce the impacts of the proposed action on the associative values of the cremations or burial sites, trails, and physiographic landforms and other geographic or constructed places to which Native American groups ascribe religious or cultural significance, the more particular suite of ethnographic resources in the project area of analysis, to a less than significant level. One or several such impacts may, as a consequence, prove not to be entirely mitigable. Evidence of earnest and thoughtful consultation under **CUL-1**, though not necessarily reducing the impacts of the proposed action to less than significant, may, nonetheless, be found to be consistent with applicable LORS.

C.3.11 NOTEWORTHY PUBLIC BENEFITS

Staff does not discern any public benefits in relation to cultural resources that would occur from the construction, operation, maintenance, or decommissioning of the proposed action that would reasonably be found to be noteworthy.

C.3.12 RESPONSE TO COMMENTS

COMMENT PERIOD

The Energy Commission published the SA/DEIS for the IVS Project on February 12, 2010. The effective comment period for the document was the Federal comment period, which was 90 days following the publication of the notice of availability (NOA) in the Federal Register by the US Environmental Protection Agency (EPA) (75 FR 8937). The EPA published the NOA on February 26, 2010 and the comment period for the joint document subsequently closed on May 26, 2010. The “Comments and Responses” subsection below reflects all comments received on the cultural resources section of the SA/DEIS and docketed at the Energy Commission through June 30, 2010. The majority of the comments were received on or prior to May 28, 2010.

Commenters on the cultural resources section of the SA/DEIS included a number of Federal agencies (NPS, EPA), non-profit organizations (Anza Trail Coalition of Arizona, Backcountry Against Dumps, Protect Our Communities Foundation, East County Community Action Coalition, Desert Protective Council, National Resources Defense Council, The Wilderness Society), labor organizations (California Unions for Reliable Energy), Native American groups and individuals (Quechan Indian Tribe, Carmen Lucas), and members of the public at large.

CHARACTER AND ORDER OF COMMENTS

The majority of the comments on the cultural resources section of the SA/DEIS related to NEPA and Section 106 issues. Energy Commission staff responses here address only those comments that can be interpreted to pertain to CEQA issues. The BLM will undoubtedly address those comments that pertain to NEPA and Section 106 in their forthcoming FEIS.

Energy Commission staff responses to CEQA comments will be relative to general categories into which the individual comments fall. The different categories have been lumped into category groups and given subheaders for the convenience of the reader.

COMMENTS AND RESPONSES

Analysis of Impacts and Development of Mitigation

Comment (*Direct and Indirect Effects Analysis Incomplete and Mitigation Measures Lack Specificity*)

The most frequent category of comment docketed for the cultural resources section of the SA/DEIS relates to the perception that the analysis of the direct and indirect impacts of the proposed action on cultural resources was incomplete, and, in part, as a consequence of that perception, that the proposed mitigation measures were not specific enough. There was a further more particular concern that the SA/DEIS had not given adequate consideration to the direct and indirect impacts of the proposed action on cultural resources that are not archaeological sites.

Response

Energy Commission staff believes that the 25 % sample of the archaeological sites in the project area of analysis that the applicant refined on the basis of the field protocol that Energy Commission and BLM staff developed for the re-recordation effort and the archaeological site description template that Energy Commission and BLM staff also provided to the applicant (see “History of the Investigation” subsection above) produced reliable results suitable to inform the present analysis, notwithstanding earlier challenges to the development of the archaeological resource inventory. Staff believes that the subject sample provides a reasonably accurate and statistically valid representation of the entire population of archaeological sites in the project area of analysis. The draft results of the complete re-recordation effort of 100 % of the archaeological resources in the project area of analysis (see “Re-Survey of Remaining Previously Recorded Sites” subsection above) appear to confirm that the original 25 % sample captured the full complement of the archaeological site types present. Staff is therefore reasonably confident that the present analysis reliably portrays the complete suite of archaeological resources that the proposed action has the potential to effect.

Energy Commission staff believes that the present analysis also evidences adequate consideration of cultural resources other than archaeological sites. Reconnaissance surveys to identify built-environment resources in the project area of analysis have been completed and none of the resources found have been recommended as being historically significant (see “Built-Environment Resources” subsection above). Pedestrian surveys, reconnaissance surveys, and intensive Native American consultation to identify and assess the historical significance of ethnographic resources inform the present analysis (see “Ethnographic Resources” subsection above), and further study and consultation under stipulations in the PA (see “Identification and Assessment of Direct Impacts on Ethnographic Resources and Recommended Mitigation” subsection above) would ensure that the ethnographic resource base is adequately taken into account.

Energy Commission staff believes that the present analysis adequately meets the requirements under the CEQA guidelines to develop mitigation measures for the consideration of agency decisionmakers. The guidelines state, in part, that

> formulation of mitigation measures should not be deferred until some future time. *However*, measures may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way (Cal. Code Regs., tit. 14, § 15064, subd. (a)(1)(B), emphasis mine).

As efforts to complete the documentation of the cultural resources in the project area of analysis and to assess the historical significance of the majority of those resources are ongoing, it is not presently possible to propose the specific manner in which each of the many potential significant impacts to which the proposed action may subject the diverse inventory of those resources would be resolved or reduced. The CEQA guidelines do not require this degree of specificity. What the guidelines do require, and what the present analysis provides (see "Historical Significance of the Cultural Resources Inventory" and "Assessment of Impacts and Discussion of Mitigation" subsections above), is explicit performance standards that articulate the general manner in which each significant effect would be resolved or reduced. The performance standards are the mitigation measures and, in the present analysis, the discussion of each performance standard includes a number of tentative proposals that would satisfy each standard. The structure of the consultations that would occur to further develop the specific manner in which significant impacts would be resolved or reduced, consultation guidance, and protocols to implement the final negotiated way that each performance standard would be met are all codified in the PA. This is the purpose and the function of the PA.

Comment (*Cumulative Impacts Analysis Not Thorough*)

A further category of concern docketed for the present siting case is whether there has been an adequate analysis of the potential direct and indirect cumulative impacts that the proposed action may have on cultural resources. Of more specific concern, the cumulative analysis of the cultural resources inventory is said to be too limited in geographic scope, to not include a comprehensive list of other projects known to be proposed in the vicinity of the IVS Project, and to offer discussions that are too cursory to properly analyze and develop mitigation for the potential cumulative impacts of the subject action.

Response

Due to the outside constraints on the schedule for the present siting case, the more thorough conclusion of the cumulative analysis must await further refinements to the assessments of the historical significance of the cultural resources in the project area of analysis. The cumulative analysis would be revised, pursuant to stipulation III(c)(ii) of the PA, upon completion of said refinements.

Comment (*Insufficient Planning for Resource Avoidance*)

Another category of concern and admonition related to the mitigation of potential significant impacts that the proposed action may have on cultural resources is whether the schedules for the Energy Commission licensing process and the BLM right-of-way application process have provided a substantive opportunity to plan for the outright avoidance of cultural resources in the project area of analysis. The CEQA guidelines, in relation to at least archaeological resources, identify “preservation in place” as the preferred treatment standard (Cal. Code Regs., tit. 14, § 15064, subd. (b)(3)(A)). (Preservation in place includes planning construction to avoid archaeological sites, incorporation of sites within parks, greenspace, or other open space, covering the archaeological sites with a layer of chemically stable soil before building tennis courts, parking lots, or similar facilities on the site, or deeding the site into a permanent conservation easement.)

Response

The schedules for the agency processes and the likely schedule for the implementation of the stipulations in the PA, while constraining the avoidance options for the action, as presently proposed, do not preclude the ability of the applicant, on an admittedly more limited scale, to avoid cultural resources in general or to practice preservation in place for individual archaeological resources. Energy Commission staff believes, however, that it is an unavoidable consequence of the accelerated schedule to which this licensing process has been and continues to be subject that there will have been insufficient time to develop a thoughtful and integrated cultural resource avoidance plan for the present configuration of the project area. The absence of formal recommendations and determinations on the historical significance of the entire inventory of cultural resources prior to a decision on the license application or prior to the onset of construction, should the project be approved, precludes the possibility of developing such a plan. Energy Commission staff further believes that a significant offset to the constraints that the licensing schedule now places on the development of an avoidance plan is the fact that the applicant, prior to the filing of the AFC for this siting case, abandoned consideration of a large area in what was the eastern portion of the originally proposed project area thereby decreasing the proposed nominal output of the proposed facility from 900 MW to 750 MW. Energy Commission staff believes that the applicant’s proactive consideration of archaeological resources during the pre-filing period should be taken into account in any deliberations on the degree to which the planning process for the proposed action has or would constrain the ability of the project to avoid cultural resources.

Comment (*Insufficient Planning for Discovery of Human Remains*)

A further category of comment on the SA/DEIS that has been docketed relates to whether there has been sufficient planning for the treatment of known and potentially discovered human remains in the project area.

Response

Energy Commission staff believes that the treatment of human remains has been more than adequately taken into account in the PA. Stipulation VI of the PA and the Native American Graves Protection and Repatriation Act Plan of Action (POA) that is appendix L to that document provide for complete treatment of such remains under both State and Federal statute and regulation.

Comment (*Insufficient Planning for Viewshed Protection*)

There has been concern docketed for the present siting case about whether the historic preservation planning process has adequately taken into account the protection of viewsheds in, across, and toward the project area for the proposed action. Concern has been expressed that the view of the constructed facility from ceremonial areas in the desert landscape would impair or degrade the use of those areas. Concern has also been expressed that the facility would also degrade the ability of the landscape, as an instrument of cultural narrative, to convey the sacred legends that are among the foundations for the ongoing preservation of Native American heritage and sense of place in the Colorado Desert.

Response

Energy Commission staff believes that the consultations that have and would continue to take place under the PA, as described in the "Identification and Assessment of Direct Impacts on Ethnographic Resources and Recommended Mitigation" subsection above, offers the most practicable means to substantively reduce degradation to desert viewsheds as the degradation of such viewsheds relates to the degradation of significant cultural resources. Ultimately, as pointed out in the said subsection, significant impacts of this type may prove to be unmitigable.

Comments on Specific Resources

Comment (*Anza Trail*)

The Energy Commission docketed a number of comments related to the potential impacts that the proposed action would have on the Anza Trail. The comments largely do not distinguish considerations of the trail as a potential cultural resource, as a visual resource, or in terms of land use or as a recreational resource. The primary focus of the Anza Trail comments that do relate to the trail as a cultural resource concerns admonitions that the Energy Commission and the BLM need to continue their efforts to determine whether material remains of the Anza Trail or of the use of the Anza Trail are present in the project area of analysis.

Response

Specific further efforts to identify material remains of the Anza Trail or of the use of the Anza Trail would be developed and implemented under the PA. Such efforts would include, under subpart I of appendix A and under appendix B to the PA, investigations such as further close-quarter pedestrian survey, the use of infrared satellite imagery, or the use of light detection and ranging (LIDAR) technology to evidence a reasonable effort to ensure that no material remains of the use of the trail are in the project area. If material remains related to the trail are ultimately found, a trail-specific HPTP would be developed and implemented under appendix B that co-opts and augments the conditions of certification related to the trail in the Visual Resources, and Land Use, Recreation, and Wilderness sections of this SSA. If material remains related to the trail are found to be absent, those latter conditions of certification would attempt to reduce the significant impacts of the proposed action on what would then be non-cultural resources considerations.

Comment (*Flat-tailed Horned Lizard as a Cultural Resource*)

Another category of comment on the SA/DEIS that has been docketed relates to the concept of the flat-tailed horned lizard (*Phrynosoma mcallii*) (FTHL), as a biological population, being a significant cultural resource that the proposed action has the potential to adversely affect. The Quechan Indian Tribe, in particular, relates that the FTHL, a species endemic to southwestern Arizona, southeastern California, and adjacent portions of Sonora and Baja California, Mexico, plays a role in the tribe's creation story and is of cultural significance to the tribe (Quechan 2010).

Response

The consideration of the FTHL as a significant cultural resource requires the antecedent considerations of whether, under CEQA or the CRHR program, a biological population can be a historical resource, and, if so, whether the FTHL population is significant under the same program. As the use of the "historical resource" concept under CEQA and the CRHR program is related to the use of the "historic property" concept under the NRHP program, Energy Commission staff believes that it is appropriate to address the question of whether and how the FTHL population may be a significant cultural resource by reviewing whether and how the population would be interpreted under the latter program. The NRHP program does not appear to provide for the consideration of individual and distinct biological populations as historic properties. The NRHP does, however, appear to allow the consideration of such populations as elements that, among a suite of other elements, contribute to the significance of historic districts and sites. The types of districts and sites where a biological population can be found to contribute to the historical significance of a resource may include a variety of different cultural landscapes and different kinds of traditional cultural properties. It is reasonable to presume that a similar argument can be made for a biological population under CEQA and the CRHR program. If one accepts this premise, the question for the FTHL would then become to what significant district or site would this species contribute. The Quechan Indian Tribe and other stakeholders in the present siting case have not identified such a district or site to date. Energy Commission staff is not aware of any Native American landscape, traditional cultural property, or other resource type for which the FTHL would be a contributing element, and feels that it would inappropriate, as non-Native Americans, to propose such a relationship between the species and a particular cultural resource. Notwithstanding the fact that this issue has not been a point of consultation to date, the commitment of the signatories to the PA to the consultation process set out in it would provide ample opportunity, going forward, to take the impacts of the proposed action on the FTHL into account.

<u>Native American Involvement</u>

Comment

A further category of comment on the SA/DEIS that has been docketed relates to the degree and character of the involvement of Native Americans in the historic preservation planning for the proposed action and in the implementation of the action, should it be approved. Comments in this category include that Native American monitors should be present to help correctly identify and interpret cultural deposits to provide a broader, non-archaeological perspective on the resource base, and that site visits should be offered to Native Americans throughout the planning and implementation processes for the proposed action.

Response

The ultimate say on the character of Native American involvement in the historic preservation planning process, under stipulation III.4 of the July 5, 2007 *Memorandum of Understanding between the U.S. Department of the Interior, Bureau of Land Management, California Desert District and the California Energy Commission Staff Concerning Joint Environmental Review for Solar Thermal Power Plant Projects* (MOU), falls to the BLM. Energy Commission staff has and continues to encourage the BLM to engage Native Americans throughout our planning processes. Staff believes that the BLM has been quite conscientious to date in their efforts to solicit and incorporate Native American input.

Provide PA and Related Mitigation Plans

Comment

A recurring comment on the SA/DEIS was that a draft of the PA and drafts of the different treatment, management, monitoring, and discovery plans that are to tier from the PA were not included in the publication of the SA/DEIS. Requests were made to include these drafts in the final environmental documents.

Response

A draft of the PA was not included in the SA/DEIS, because the document was in an early stage of development at the time of the publication of the SA/DEIS. The most recent drafts of the PA and the appendices to the PA are included in this SSA. The drafts of a number of the plans that would tier from the PA are under development. Some of those will be available prior to the time of agency decisions, and draft of others of the plans would only be developed subsequent to agency approval of the proposed action.

Consideration of Comments

Comment

Another comment docketed for the present siting case was that BLM and Energy Commission staff should substantively consider the complete complement of the comments received on the SA/DEIS.

Response

Energy Commission staff believes that the discussion of comments in the present subsection evidences such consideration.

C.3.13 PROPOSED CONDITION OF CERTIFICATION

CUL-1 The applicant shall be bound to abide, in total, to the terms of the programmatic agreement that the BLM is to execute under 36 CFR § 800.14(b)(3) for the proposed action. If for any reason, any party to the programmatic agreement were to terminate that document and it were to have no further force or effect for the purpose of compliance with Section 106 of the National Historic Preservation Act, the applicant would continue to be bound to the terms of that original agreement for the purpose of compliance with CEQA until such time as a successor agreement had been negotiated and executed with the participation and approval of Energy Commission staff.

Verification: Under the terms of the programmatic agreement, the applicant shall submit all documentation required by the agreement to the Compliance Project Manager (CPM) for review and approval.

C.3.14 CONCLUSIONS AND RECOMMENDATIONS

This cultural resources analysis concludes, on the basis of a 25 % sample of the cultural resources inventory of the project area of analysis, that the IVS Project would have significant impacts on a presently unknown subset of approximately 330 known prehistoric and historical surface archaeological resources and may have significant impacts on an unknown number of buried archaeological deposits, many of which may be determined historically significant under the provisions of the proposed PA. The implementation of the proposed action may also have further significant impacts on ethnographic resources. The adoption and implementation of Condition of Certification **CUL-1** would reduce the potential impacts of the proposed action on the information values of the archaeological resources in the project area of analysis to less than significant under CEQA, would resolve analogous impacts under Section 106 of the National Historic Preservation Act, and would further ensure that the proposed action would, in this regard, be in conformity with all applicable laws, ordinances, regulations, and standards. The adoption and implementation of **CUL-1** would lessen, although not necessarily substantially, the significant impacts of the proposed action on the associative values of the archaeological and ethnographic resources in the project area of analysis. Significant impacts to these latter values may be unmitigable.impacts
Staff recommends that the Commission adopt **CUL-1** and reiterates the consideration that further consultation among Federal and State agencies, Native American groups, the applicant, and the public is unlikely to reduce the overall effect of the proposed action’s implementation to a less than significant level. Staff believes that **CUL-1** has the potential, should the condition be well adhered to, to substantially reduce the impact of the proposed action on the information values of the archaeological resources on and near the project area through the careful design and implementation of plans to recover and interpret resource data. While **CUL-1** also provides consultation processes to facilitate the reduction of project impacts to the associative values of archaeological and ethnographic resources, the issues are complex and may prove very difficult to resolve. Different cultural perspectives among the consulting parties may make it difficult to agree on the fundamental issue of how to bound the ethnographic resources, or on whether and how visual impacts to the resources’ associative values can be meaningfully reduced. Staff believes, nonetheless, that **CUL-1** represents the best available means to address the significant impacts that the proposed action would have on significant cultural resources.

C.3.15 REFERENCES

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C.3.16 CULTURAL RESOURCES GLOSSARY

AFC	Application for Certification
ARMR	Archaeological Resource Management Report
CCS	Cryptocrystalline silicate (Cryptocrystalline silicates are rocks such as flint, chert, chalcedony, or jasper that contain a high percentage of silica (SiO^2), the primary compound that composes quartz.)
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
Conditions	Conditions of Certification
CPM	Compliance Project Manager
CRHR	California Register of Historical Resources
CRM	Cultural Resources Monitor
CRR	Cultural Resource Report
CRS	Cultural Resources Specialist
DPR 523	Department of Parks and Recreation cultural resources inventory form
FAR	Fire-affected rock
FSA	Final Staff Assessment
Historical resource	A cultural resource, for the purpose of CEQA, listed in, or determined to be eligible for listing in, the California Register of Historical Resources (PRC § 21084.1). Subsumed in present analysis under "important historic and cultural aspects of our national heritage."
Historic property	A cultural resource, for the purpose of Section 106, included in, or eligible for inclusion in the National Register of Historic Places (36 CFR § 800.16(l)(1). Subsumed in present analysis under "important historic and cultural aspects of our national heritage."
HRMP	Historical Resources Management Plan
Important historic and cultural aspects of our national heritage	A broadly inclusive term for historically significant cultural resources that encompasses the concepts of "historical resource" and "historic property."
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	California Office of Historic Preservation
Programmatic agreement	An agreement document negotiated and drafted under Section 106 of the National Historic Preservation Act of 1969
Project area	The project site, the rights-of-way of all linear and other ancillary power facility features, construction laydown areas, and non-commercial borrow sites
Project area of analysis	The project area and all further areas in which the proposed project has the potential to directly or indirectly affect cultural resources
Project site	The principal proposed plant site parcel or main plant site of which the power block area and the solar thermal field would occupy the majority of that area
Proposed action	Equivalent in present analysis to “proposed project” and “undertaking.” The “proposed action” and other “alternative actions” are developed under NEPA to meet a specified purpose and need.
Proposed project	Equivalent in present analysis to “proposed action” and “undertaking.” A “project,” pursuant to 14 CCR § 15378, “means the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment.”
PSA	Preliminary Staff Assessment
SHPO	State Historic Preservation Officer
Staff	Energy Commission cultural resources technical staff
Undertaking	Equivalent in present analysis to “proposed action” and “proposed project.” An undertaking, pursuant to 36 CFR § 800.16(y), “means a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval.”
WEAP	Worker Environmental Awareness Program

APPENDIX A

SITE DESCRIPTIONS FOR 25% SAMPLE OF CULTURAL RESOURCES INVENTORY FOR THE IVS PROJECT

DRK-002

DRK-002 is an oblong-shaped prehistoric site that covers a total surface area of 289.5 square meters. The site is located within the western portion of the 300 MW area of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site includes creosote, burroweed, ocotillo, and cholla.

This lithic scatter site measures 37 meters north to south by 10 meters east to west, and contains a total of 18 prehistoric artifacts. It consists of one concentration interpreted to be a single reduction locus. The prevailing cultural constituents within this site consist of prehistoric artifacts. Artifact density at DRK-002 is low, with a calculated distribution of one artifact per 16.08 square meters. The overall condition of this site is fair to good, with some alterations caused by off highway vehicle activity as evidenced by the presence of two parallel, single off-road vehicle tracks running through the northern portion of the site in an east to west direction.

This site contains one lithic reduction locus and a total of 18 artifacts, which include: 15 green porphyritic metavolcanic flakes (five primary, two secondary and eight tertiary), two green metavolcanic bi-directional cores, and one green metavolcanic hammerstone.

Locus 1 is at the northwestern site boundary and measures three meters northeast to southwest by one meter northwest to southeast. Artifacts observed within Locus one include 14 green porphyritic metavolcanic flakes (four primary, two secondary and eight tertiary) and two green metavolcanic bi-directional cores.

Those artifacts observed within 30 meters and outside of the loci consist of one green metavolcanic hammerstone with two battered edges and one green metavolcanic primary flake. The further character of artifacts found within DRK-002 is unreported.

The more particular physical context for DRK-002, extrapolating information from Data Response 112 Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature; debitage consists primarily of primary, secondary, and tertiary flakes, bi-directional cores, and a single hammerstone. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone material (metavolcanic) that is a constituent of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent one single reduction locality or episode, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. DRK-002 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area there is very low likelihood for subsurface archaeological deposits. Therefore, data potential is considered exhausted through recordation of DRK-002.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, DRK-002 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

DRK-004

DRK-004 is an oblong-shaped archaeological deposit that includes both prehistoric and historic components and covers a total surface area of 207 square meters. The site is located within the western portion of the 300 MW area of the Proposed IVS Project. The site is situated atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site is covered by intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles. A large north-south trending, active (ephemeral) wash bounds the site to the east, and another wash that is east-west trending bounds the site to the north; a third active ephemeral east-west trending gully bisects the site. Vegetation species on the site include creosote, burroweed, salt bush, and ocotillo.

This archaeological deposit measures 31 meters north to south by six meters east to west, and contains a total of 35 prehistoric artifacts. The prehistoric component consists of two concentrations of lithic artifacts, interpreted to be one single reduction locus and one lithic scatter, with 34 artifacts. The historic component consists of one feature. One additional artifact was observed outside the loci and feature. The prevailing cultural constituents within this site consist of prehistoric lithic reduction debitage. Artifact density at DRK-004 is low, with a calculated distribution of one artifact per 5.91 square meters. The overall condition of the site is good with no visible alterations noted.

This site contains one historic feature, two single reduction loci and a total of 35 prehistoric artifacts, which include: 29 green metavolcanic flakes (nine primary, 18 secondary and two tertiary), one black metavolcanic primary flake, one black basalt tested cobble with two flake scars, one green metavolcanic multi-directional core and three green metavolcanic hammerstones.

Feature one is located 15 meters north of Locus one and consists of a historic “brass cap” State of California Division of Highways benchmark stamped, “IMP 1 2B” and “MON BO.”, with an associated guy-wire cairn. The survey cairn is located adjacent to, and immediately north of, the brass cap marker. The historic survey cairn rises three courses high, measuring 54 inches north to south by 42 inches east to west by 49 inches tall, and is constructed of 40 rocks of various source materials (green porphyritic metavolcanic, quartz, granitic, black metavolcanic and quartzite); the diameter of rocks used range from one inch to 16 inches and several boulders have visible calcification on the surface. Several pieces of lath are scattered around Feature 1.

Locus one is located three meters north of the site datum and measures two meters north to south by two meters east to west. Artifacts observed within Locus one include 17 green metavolcanic flakes (four primary, 12 secondary and one tertiary).

Locus 2 is located 15 meters southeast of Locus one and measures four meters north to south by four meters east to west. Artifacts observed within Locus 2 include: 12 green metavolcanic flakes (five primary, six secondary and one tertiary), one black metavolcanic primary flake, one basalt tested cobble, one green metavolcanic core and two green metavolcanic hammerstones.

Those artifacts observed within 30 meters and outside of the loci consist of a single black and gray metavolcanic hammerstone. The further character of artifacts found within DRK-004 is unreported.

The more particular physical context for DRK-004, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009).

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret the prehistoric component of this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists primarily of primary and secondary flakes, a multi-directional core, and hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of two primary stone materials (metavolcanic and basalt) that are constituents of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent two single reduction localities or episodes. It should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

The historic component of this site represents a highway survey marker associated with the Division of Highways activity and could possibly represent one of the California Right of Way Markers, or “C” Block cement markers, used between 1914 and 1934 to delineate the right of way boundary lines along state routes (Windmiller 1999). The rock cairn appears to be associated with the historic highway survey marker and shows evidence of purposeful construction. The presence of wooden laths around the rock cairn indicate possible guy-wire anchor points, likewise indicating use during survey activities. The rock cairn has characteristics similar to other survey markers in the area. No temporally diagnostic historic artifacts were found and it seems unlikely that the feature contains cultural materials, given the structure of the cairn (size-sorted stones that have become tightly packed and evidence of sand accumulation/deposition amongst stones).

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. However, benchmarks such as the one present at this site may be protected by law, therefore it is recommended that the benchmark present at DRK-004 be left undisturbed during construction activities.

DRK-005

DRK-005 is an oblong-shaped prehistoric site that covers a total surface area of 187.3 square meters. The site is located within the western portion of the 450 MW area of the Proposed IVS Project. The site is situated atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote.

This lithic scatter site measures 72 meters north to south by 22 meters east to west, and contains a total of 97 prehistoric artifacts. It consists of six concentrations, interpreted to be loci, with 96 artifacts plus one additional artifact observed outside the loci. The prevailing cultural constituents within this site consist of lithic reduction debitage. Artifact density at DRK-005 is low, with a calculated distribution of one artifact per 1.95 square meters. The overall condition of the site is good; however, the site is partially eroded and sloping into an ephemeral gully that runs along the western edge of the site.

The artifact types and materials present at the site include: 61 gray metavolcanic flakes (17 primary, 22 secondary, 16 tertiary and six shatter), 31 light purple rhyolite flakes (four primary, five secondary, 11 tertiary and 11 shatter), one heavily patinated basalt secondary flake, three gray metavolcanic multi-directional cores and one gray metavolcanic fragmented uni-directional core.

Locus one is located at the northern end of the site and measures seven meters northwest to southeast by two meters northeast to southwest. Artifacts observed within Locus one include: 26 gray metavolcanic flakes (nine primary, nine secondary, five tertiary and three shatter), one multi-directional gray metavolcanic core and one uni-directional gray metavolcanic core fragment.

Locus 2 is located 26 meters southwest of Locus one and measures five meters northwest to southeast by two meters northeast to southwest. Artifacts observed within Locus 2 include: 14 gray metavolcanic flakes (two primary, three secondary, six tertiary and three shatter).

Locus 3 is located 22 meters northeast of Locus 2 and measures two meters north to south by two meters east to west. Artifacts observed within Locus 3 include: 12 gray metavolcanic flakes (two primary, nine secondary and one tertiary) and one metavolcanic multi-directional core.

Locus 4 is located 24 meters southeast of Locus 3 and measures six meters northeast to southwest by three meters northwest to southeast. Locus 4 includes 26 purple rhyolite flakes (three primary, three secondary, nine tertiary and 11 shatter).

Locus 5 is located six meters southwest of Locus 4 and measures four meters northeast to southwest by three meters northwest to southeast. Locus 5 includes: nine gray metavolcanic (four primary, one secondary and four tertiary), five purple rhyolite (one primary, two secondary and two tertiary) and one metavolcanic multi-directional core.

One artifact, heavily patinated basalt secondary flake, is observed within 30 meters and outside the loci. The further character of artifacts found within DRK-005 is unreported.

The more particular physical context for DRK-005, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists primarily secondary and tertiary flakes and multi-directional cores. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone material (metavolcanic) that is a constituent of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent five single reduction localities or episodes, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, DRK-005 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

DRK-010

DRK-010 is an amorphous-shaped archaeological deposit that includes both prehistoric and historic components that cover a total surface of 3,770 square meters. The site is located within the western portion of the 300 MW area of the Proposed IVS Project. The site is atop an elevated, very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. There are surfaces, absent of rock where sand has built up around past vegetation. Vegetation species on the site include creosote, desert trumpet, salt bush, ocotillo, indigo bush and cholla.

This site measures 109 meters north to south by 53 meters east to west, and contains a total of 199 prehistoric and five historic artifacts. The prehistoric component consists of 11 concentrations interpreted to be eight single reduction loci and three lithic scatters, with 186 artifacts plus 13 prehistoric artifacts observed outside the loci.

The historic component consists of four historic rock cluster features, one US General Land Office (GLO) benchmark feature, with five additional historic artifacts observed outside the features and loci. The prevailing cultural constituents within this site are prehistoric lithic reduction debitage, historic refuse artifacts, and historic features. Artifact density at DRK-010 is low, with a calculated distribution of one artifact per 18.48 square meters. The overall condition of the site is good with some alterations due to off-highway vehicles.

Artifact types and materials represented at the site include: 118 metavolcanic flakes (37 primary, 46 secondary, 22 tertiary and 13 shatter), 47 quartz flakes (14 primary, 12 secondary and 21 shatter), seven cryptocrystalline silicate chalcedony flakes (one primary and six shatter), two cryptocrystalline silicate chert flakes (one primary and one secondary), two petrified wood flakes (one primary and one tertiary), seven metavolcanic cores (one uni-directional, three bi-directional, three multi-directional), two quartz cores (one bi-directional, one multi-directional), two cryptocrystalline silicate chert cores (one bi-directional, one multi-directional), one petrified wood multi-directional core, five metavolcanic tested cobbles, five metavolcanic hammerstones, and one quartzite hammerstone. Historic artifacts found outside of loci and features include two tobacco tins and three bailing wire fragments.

Feature 1 is a historic US General Land Office brass cap benchmark located in the central portion of the site that reads: "US GENERAL LAND OFFICE SURVEY/PENALTY $250 REMOVAL/T16S R10E (with 1/4 section info)/191_" . Surrounding the benchmark are four small to large sub-rounded metavolcanic and granite cobbles and a fallen stake with a 1.75-inch wide lath nailed to it with three round head finishing nails. The length of the stake is 7.5 feet and it is laying on the ground in a north to south direction. Also associated with this feature is bailing wire which was used to attach the stake to the benchmark.

Feature 2 is a potentially historic rock cluster that measures 18 inches north to south by 19 inches east to west by seven inches in height and is located 27 feet southwest of Feature 1. It is constructed of approximately 12 sub-rounded to sub-angular granite, metavolcanic and basalt cobbles and two courses high. No artifacts were found associated with Feature 2.

Feature 3 is a potentially historic rock cluster that measures 19 inches northwest to southeast by 30 inches northeast to southwest by seven inches in height and is located 49 feet north of Feature 2. It is constructed of 12 small to large sub-rounded to sub-angular metavolcanic, granite and basalt cobbles. The rock cluster appears to have been disarticulated to a single level with rocks lightly scattered. No artifacts were found associated with Feature 3.

Feature 4 is a potentially historic rock cluster that measures 18 inches north to south by 27 inches east to west by four inches in height and is located 35.9 feet east of Feature 3. It is constructed of 24 small to large sub-rounded quartz, metavolcanic, basalt and granite cobbles. The rock cluster appears to have been disarticulated to a single level with rocks lightly scattered. No artifacts were found associated with Feature 4.

Feature 5 is a potentially historic rock cluster that measures 24 inches north to south by 27 inches east to west by 10 inches in height located 33.6 feet south southwest of Feature 4. It is constructed of 19 small to large sub-rounded to sub-angular petrified wood, metavolcanic and granite cobbles and rises two courses high. No artifacts were found associated with Feature 5.

Locus one measures 4.40 meters northeast to southwest by two meters northwest to southeast and is located in the central portion of the site. Artifacts observed within Locus one include: 25 metavolcanic flakes (nine primary, six secondary, five tertiary and five shatter), two metavolcanic cores (one uni-directional and one multi-directional) and one tested metavolcanic cobble.

Locus 2 is located 21.3 meters northeast from Locus one and measures 2.10 meters northwest to southeast by 1.50 meters northeast to southwest. Artifacts observed within Locus 2 include: 14 metavolcanic flakes (two primary, seven secondary, four tertiary and one shatter) and one metavolcanic multi-directional core.

Locus 3 is located 7.90 meters north from Locus 2 and measures 2.20 meters east to west by 1.10 meters north to south. Artifacts observed within Locus 3 include: eight metavolcanic flakes (two primary, four secondary, one tertiary and one shatter) and one metavolcanic bi-directional core.

Locus 4 is located 18.1 meters northwest from Locus 3 and measures 1.30 meters northeast to southwest by 0.70 meters northwest to southeast. Artifacts observed within Locus 4 include: 11 metavolcanic flakes (five primary, one secondary, four tertiary and one shatter) and one metavolcanic bi-directional core.

Locus 5 is located 3.5 meters north northwest from Locus 4 and measures 1.80 meters northeast to southwest by 1.10 meters northwest to southeast. Artifacts observed within Locus 5 include: 18 metavolcanic flakes (four primary, seven secondary, six tertiary and one shatter), one metavolcanic multi-directional core, two metavolcanic tested cobbles and two metavolcanic hammerstones.

Locus 6 is located 81 meters east from Locus 5 and measures 2 meters northwest to southeast by 1.20 meters northeast to southwest. Artifacts observed within Locus 6 include: nine metavolcanic flakes (two primary, six secondary and one shatter) and one metavolcanic tested cobble.

Locus 7 is located 21.8 meters northwest from Locus 6 and measures 3 meters north to south by 1.90 meters east to west. Artifacts observed within Locus 7 include: 30 quartz flakes (10 primary, six tertiary and 14 shatter) and one quartz multi-directional core.

Locus 8 is located 11.7 meters northwest from Locus 7 and measures 2.70 meters northwest to southeast by 1.70 meters northeast to southwest. Artifacts observed within Locus 8 include: 18 metavolcanic flakes (eight primary, eight secondary and two shatter).

Locus 9 is located 39.1 meters northeast from Locus 8 and measures 2.80 meters southwest to northeast by 1.60 meters northwest to southeast. Artifacts observed within

Locus 9 include: seven metavolcanic flakes (one primary, four secondary and two shatter), one metavolcanic bi-directional core and one metavolcanic hammerstone.

Locus 10 is located 16.5 meters south from Locus 9 and measures 3 meters north to south by 3 meters east to west. Artifacts observed within Locus 10 include: eight quartz flakes (three primary, three tertiary and two shatter), five metavolcanic flakes (two primary and three secondary) and four cryptocrystalline silicate chalcedony flakes (one primary and three shatter).

Locus 11 is located 8.10 meters southeast from Locus 10 and measures 3.50 meters east to west by 1.60 meters north to south. Artifacts observed within Locus 11 include: nine quartz flakes (one primary, three tertiary and five shatter), three cryptocrystalline silicate chalcedony shatter, one quartz bi-directional core and one quartzite hammerstone.

Those artifacts observed within 30 meters and outside of the loci and features consist of: two cryptocrystalline silicate chert flakes (one primary, one secondary), two cryptocrystalline silicate chert cores (one bi-directional, one multi-directional), three metavolcanic flakes (two primary, one shatter), one metavolcanic tested cobble, two metavlocanic hammerstones, two petrified wood flakes (one primary, one tertiary), one petrified wood multi-directional core, two historic Prince Albert tobacco tins, and three historic bailing wire fragments.

The further character of artifacts associated with DRK-010 is unreported.

The more particular physical context for DRK-010, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007); therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret the prehistoric component of this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature; debitage consists of primary, secondary, and tertiary flakes, cores, angular waste/shatter, and hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this multicomponent site are of the same primary stone materials (metavolcanic, quartz, and cryptocrystalline silicate) that are constituents of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least 11 reduction localities or episodes; but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Archaeologists for the applicant interpret that historic General Land Office (GLO) cadastral benchmarks such as the one found in DRK-010 were placed by surveyors as a part of the Public Lands Survey System (PLSS). That system divided public lands into sections of one square mile (640 acres) and into quarter sections of 160 acres. The PLSS was created by the Land Ordinance of 1785, which declared that lands outside the then-existing states could not be sold, otherwise distributed, or opened for settlement prior to being surveyed (Stewart 1935). Along with the Homestead Act of 1862 and the Desert Land Act of 1877, the PLSS helped facilitate the U.S. expansion westward in the late 19th and early 20th centuries. For unknown reasons the date stamp on this particular brass cap was left incomplete so the date it was placed cannot be definitively known. However, the style and construction of this benchmark is similar to others observed in the area that are marked with the date 1912, so it seems likely that this benchmark was placed during the same survey effort.

Archaeologists for the applicant interpret that the rock clusters present at DRK-0 10 are likely contemporaneous with the GLO Survey benchmark (Feature 1), and somehow associated with it, but the purpose of that association is not readily apparent. Features 2 through 5 are all placed roughly equidistant (approximately 27 feet) from Feature one (GLO bench mark), which would seem to be an intentional arrangement likely designed by the surveyors. Curiously, they are aligned off-axis from cardinal directions at inexact angles, making it seem unlikely that they are directional benchmarks.

An alternative explanation might be that the clusters once were expediently constructed stone markers of mining claims or homestead boundaries. Mining claim markers sometimes contain tobacco tins to hold copies of official records substantiating the claim. A tobacco tin was found at the site but it contained no deed or note and was located near, but not within, Feature 1; so its association with that feature could be spurious. The straight sided tobacco tin found at this site is of a type that was common from about 1907 until 1988 when R.J. Reynolds Company changed from metal tobacco tins to paper and plastic pouches (Rock 1988:75). That date range may coincide with the speculative 1912 date of the survey effort that placed the GLO benchmark, so it is possible that the GLO surveyors discarded the tobacco tin during their work at this location.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction; and analysis of artifact distribution has been accounted for during the recordation process. This geomorphic landform indicates a Pleistocene (or older) period of formation, and because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits. Therefore, data potential is considered exhausted through recordation of DRK-010.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, DRK-010 is not considered a contributor to an existing and/or proposed archaeological district or landscape. Destruction is still prohibited under federal law; therefore, it is recommended that the US GLO benchmark be left undisturbed during construction activities.

DRK-011

DRK-011 is an oblong-shaped prehistoric lithic scatter site that covers a total surface of 1,416 square meters. The site is located in the western portion of the 300 MW area of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, chalcedony, quartz, quartzite and granitic gravels and cobbles. Soils contain alluvial sands originating from decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site includes creosote, salt bush, burroweed, ocotillo, cholla, desert trumpet, smoke tree and bunch grass.

This lithic scatter site measures 141 meters northeast to southwest by 39 meters northwest to southeast and contains a total of 187 prehistoric artifacts. It consists of six concentrations interpreted to be six single reduction loci with 172 artifacts and 15 additional artifacts were observed outside the loci. The prevailing cultural constituents within this site consist of prehistoric lithic reduction debitage. Artifact density at DRK--011 is low, with a calculated distribution of one artifact per 7.57 square meters. The overall condition of the site is good with the exception of two off-highway vehicle tracks through the site.

The site contains six lithic reduction loci and a total of 187 artifacts (172 associated with the loci), which include: 158 metavolcanic flakes (49 primary, 39 secondary and 70 tertiary), 17 metavolcanic shatter, one chalcedony primary flake, three multi-directional cores (two metavolcanic and one basalt), two metavolcanic uni-directional cores and six point provenience metavolcanic hammerstones. The areas between the loci and within 30 meters contain a sparse distribution of individual artifacts throughout the site.

Locus 1, within the north end of the site, is located 38 meters southeast of the center of the natural occurring sand circle or datum and measures 6.6 meters northeast to southwest by 1.6 meters northwest to southeast. Artifacts observed within Locus one include: 26 gray metavolcanic flakes (10 primary, four secondary and 12 tertiary), two gray metavolcanic shatter, one gray metavolcanic multidirectional core and one gray metavolcanic hammerstone.

Locus 2 is located 24 meters west of Locus one and measures two meters northwest to southeast by one meter northeast to southwest. Artifacts observed within Locus 2 include six gray metavolcanic flakes (two primary, two secondary and two tertiary).

Locus 3 is located 30 meters north of Locus 2 and measures one meter east to west by one meter north to south. Artifacts observed within Locus 3 include: 11 green metavolcanic flakes (four primary, two secondary and five tertiary) and one gray metavolcanic hammerstone.

Locus 4 is located 42 meters southwest of Locus 3 and measures two meters north to south by one meter east to west. Artifacts observed within Locus 4 include: 11 green metavolcanic flakes (four primary, three secondary and four tertiary), one green metavolcanic shatter and one metavolcanic unidirectional core.

Locus 5 is located 42 meters southwest of Locus 4 and measures 13 meters northeast to southwest by three meters northwest to southeast. Artifacts observed within Locus 5 include 92 green metavolcanic flakes (26 primary, 23 secondary and 43 tertiary) and 13 green metavolcanic shatter.

Locus 6 is located 32 meters north of Locus 5 and measures one meter north to south by one meter east to west. Artifacts observed within Locus 6 include: four green/gray metavolcanic flakes (two secondary and two tertiary), one green/gray metavolcanic shatter and one metavolcanic multidirectional core.

A sparse distribution of artifacts observed within 30 meters and outside of the loci consists of seven metavolcanic flakes (two primary, three secondary and two tertiary), one primary chalcedony flake, one basalt multi-directional core, one uni-directional metavolcanic core, one metavolcanic tested cobble and four metavolcanic hammerstones. The further character of artifacts associated with DRK-011 is unreported.

The more particular physical context for DRK-011, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007); therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature: debitage consists predominantly of primary and tertiary flakes, three multi-directional cores, two uni-directional cores, angular waste/shatter, and hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter site are of the same three primary stone (metavolcanic, basalt, and chalcedony) materials that are typical constituents of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least six single reduction localities or episodes, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction and analysis of artifact distribution has been accounted for during the recordation process. The fan piedmont geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area there is very low likelihood for subsurface archaeological deposits, therefore data potential is considered exhausted through recordation of DRK-011.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, DRK-011 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

DRK-020

DRK-020 is a bronze cap benchmark stamped with the following: "U.S. General Land Office/1912", corner sections, "13, 18, 24, 19", as well as the township and range information, "T1 6S, R1 0E, R1 1 E". A piece of modern wooden lath is staked in the ground at the benchmark. The site is located within the western portion of the 300 MW area of the Proposed IVS Project. The site is situated atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site is covered by heavily disturbed desert pavement with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote and ocotillo.

A single historic bullet casing artifact was observed adjacent to the historic benchmark. The bullet is from a 38 special and reads "REM UMC/38 SPL". The overall condition of the site is good, but the surrounding area has been heavily disturbed due to its proximity to what appear to be recent borrow pits to the east and south of the site.

The more particular physical context for DRK-020, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009).

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret that General Land Office cadastral markers such as the one found in DRK-020 were placed by surveyors as a part of the Public Lands Survey System (PLSS). That system divided public lands into sections of one square mile (640 acres) and into quarter sections of 160 acres. The PLSS was created by the Land Ordinance of 1785, which declared that lands outside the then-existing states could not be sold, otherwise distributed, or opened for settlement prior to being surveyed (Stewart 1935). Along with the Homestead Act of 1862 and the Desert Land Act of 1877, the PLSS helped facilitate the U.S. expansion westward in the late 19th and early 20th centuries. The General Land Office survey marker present at DRK-020 is stamped "1912," indicating the date that it was placed.

Also found at DRK-020 is a single bullet cartridge with "REM UMC" stamped on the base, indicating that it was manufactured by the merged companies of Remington and Union Metallic Cartridge. Cartridges with that stamp were manufactured between 1911 and present (Goodman 2002).

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction; and analysis of artifact distribution has been accounted for during the recordation process. Due to the absence of artifacts other than the single bullet, and geomorphic location of this historic feature, there is very low likelihood for subsurface archaeological deposits.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. However, destruction of General Land Office survey markers is prohibited under federal law; therefore, it is recommended that the US GLO benchmark be left undisturbed during construction activities.

DRK-047

DRK-047 is an oblong L-shaped prehistoric lithic reduction site that covers a total surface of 104 square meters. The site is located within the western portion of the 300 MW area of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of a very old fan surface covered by intact desert pavement that is well developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote and burroweed.

This lithic reduction site measures 35 meters northwest to southeast by 19 meters northeast to southwest, and contains a total of 44 prehistoric artifacts. It consists of two concentrations of lithic artifacts, interpreted to be a single reduction locus and a lithic scatter. The prevailing cultural constituents within this site consist of prehistoric lithic reduction debitage. Artifact density at DRK-047 is low, with a calculated distribution of one artifact per 2.36 square meters. The site is bound by a medium sized ephemeral gully to the west and two small ephemeral gullies to the north, east and south. The overall condition of the site is good with no visible alterations except for a faint off-highway vehicle two track located on the eastern portion of the site.

The site contains two loci and a total of 44 artifacts, which include: 32 basalt flakes (16 primary, eight secondary, one tertiary and seven shatter), three porphrytic metavolcanic primary flakes, five translucent quartz flakes (three primary and two shatter), one basalt bi-directional core, two tested cobbles (one basalt and one quartz) and one granitic mano.

Locus one is located at the southeast end of the site and measures two meters north to south by two meters east to west. Artifacts observed within Locus one include: 32 fine grained basalt flakes (16 primary, eight secondary, one tertiary and seven shatter), one basalt tested cobble, three heavily weathered porphrytic metavolcanic primary flakes and one bidirectional fine grained basalt core.

Locus 2 is located 32 meters northwest of Locus one and measures two meters northwest to southeast by one meters northeast to southwest. Artifacts observed within Locus 2 include five semi-translucent white quartz flakes (three primary and two shatter) and one tested cobble.

Those artifacts observed within 30 meters and outside of the loci consist of one granitic bifacial mano with a moderately repatinated surface and evidence of heavy use wear; that measures 15.5 centimeters by eight centimeters by five centimeters. The further character of artifacts associated with DRK-047 is unreported.

The more particular physical context for DRK-047, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007); therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont. The desert pavement consists of small to large, sub-rounded to sub-angular metavolcanic, basalt, quartz, quartzite and granite gravels and cobbles. Alluvial sand soils consisting of decomposed metavolcanic and granitic gravels and cobbles are also present.

The flaked stone assemblage at this site represents an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists primarily of primary and secondary flakes and a bi-directional core. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone material (fine grained basalt, translucent quartz, porphyritic metavolcanic) that is a constituent of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent multiple reduction localities or episodes, but it should not be discounted that artifacts within this localities may have been collected and/or used at a later point in time.

The ground stone tool assemblage at this site represents subsistence resource procurement and/or processing. Ground stone tools were made by grinding, abrading, pecking, pounding, and polishing rather than chipping and flaking. Ground stone tools found in the area surrounding DRK-047 include one mano. Manos, metates, and pestles were primarily constructed from coarse-grained stone such as sandstone or granite, and are associated with subsistence procurement and/or processing (Chartkoff and Chartkoff 1984). However, the particular mano present at DRK-047 has no distinguishing characteristics that would provide data pertinent to any meaningful period in prehistory.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. DRK-047 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area there is very low likelihood for subsurface archaeological deposits, therefore data potential is considered exhausted through recordation of DRK-047.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, DRK-047 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

EBR-010A

EBR-010A is an oval-shaped prehistoric site that covers a total surface area of one square meter. The site is located within the western portion of the 300 MW area of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote, ocotillo and cholla.

This site measures three meters northeast to southwest by one meter northwest to southeast, and contains a total of 10 prehistoric artifacts distributed throughout the site. The prevailing cultural constituents within this site consist of ceramic sherds interpreted to be a single vessel. Artifact density at EBR-010A is low, with a calculated distribution of one artifact per 0.13 square meters. The overall condition of the site is fair to good, with some alterations caused by off-highway vehicle activity to the east and west of the site.

Specifically the artifact types and materials present at this site include 10 very weathered ceramic buffware sherds, which include two direct rims and eight body sherds. The further character of artifacts associated with site EBR-010A is unreported.

The more particular physical context for EBR-010A, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret sites like EBR-010A containing only ceramic sherds as the result from the loss or discard of one or more vessels or other ceramic object. Ceramic scatters such as this can also result when ceramic sherds have been displaced from their original context by erosion and/or mechanical processes. Based on the two of the direct rim sherds, the vessel appears to have been a small mouth olla.

Characteristics of ceramic sherds such as those present at EBR-010A can provide data pertinent to questions regarding prehistoric ceramic production technologies and the ethnic origin of the vessels from which they came. Currently, the primary ethnic groups known to have occupied region surrounding EBR-010A include the Diegueño and Tipai (Kamia). Other groups known to have used/traveled/inhabited the area include the Cocopa, Kumeyaay, Ipai, Quechan, Paipai and Cahuilla (Luomala 1978; Schaefer and Laylander 2007, URS 2009). In approximately AD 1200, the course of the Colorado River changed, refilling Lake Cahuilla and providing a stable water source that drew people from surrounding regions to repopulate the Colorado Desert. Ceramic wares which were introduced centuries before in other areas were brought into this region at that time (URS 2009). However, it has been argued that stable populations around the lake developed their own distinctive pottery formulas that became regional expressions of their families and locales (May ND). Although these groups each had specific approaches to the creation of ceramics, ceramic vessels were also traded along with subsistence resources and other items, infusing some uncertainty into the use of data from ceramics to associate one particular area with a particular tribal group or family (May ND). Therefore, it is unlikely that surface data could directly relate EBR-010A or the area surrounding it to a particular tribe.

Data gathered on ceramics in the area surrounding EBR-010A show evidence of a variety of ceramic types and techniques. Though paddle-and-anvil construction techniques were common among groups using this area, the tempers employed, vessel types manufactured, and decoration did vary between groups. The Diegueño used ground clay and did not add temper when manufacturing ceramics. They created a variety of vessels including ollas; bowls, cooking pots and pipes (Rogers 1973:18, URS 2009). The Kamia sometimes added rose quartz as temper and produced the greatest variety of ceramics among the Yuman bands, including ollas, jars, canteens, bowls, rattles, plates, scoops, cups and parchers. Kamia ceramics were painted after firing with red and/or black designs (Gifford 1931, Rogers 1973, URS 2009, Van Camp 1979:57). The Cocopah used ground and winnowed clay tempered with ground sherds to create a variety of vessels used for storage and cooking (Alvarez de Williams 1983:99, URS 2009). Quechan vessel types include bowls, parchers, cooking pots, small figurines, and large storage vessels that were used to float goods across rivers (Bee 1983:10, McGuire 1982, URS 2009).

The analysis necessary to derive all possible data from ceramic sherds such as those present at EBR-010A is typically beyond the scope of field survey archaeology. Therefore, it is recommended that these artifacts be analyzed by a ceramics specialist before a final determination of eligibility can be made.

Based on currently available data, the material remains cannot be definitively associated with a meaningful portion of prehistory. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. In addition, this geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area there is very low likelihood for subsurface archaeological deposits; therefore, data potential is considered exhausted through recordation of EBR-010A.

Due to the presence of temporally diagnostic artifacts (ceramics), further data is necessary to determine if this site, as a stand-alone or individual resource, should be recommended as eligible or not eligible for the National Register, and if it is or is not a historic property pursuant to the National Register or a historical resource per the California Register under the criteria for eligibility. In addition, EBR-010A is not considered a contributor to an existing and/or proposed archaeological district or landscape.

EBR-020

EBR-020 is an amorphous-shaped prehistoric site that covers a total surface area of 6.65 square meters. The site is located within the western portion of the 300 MW area of the Proposed IVS Project. The site is situated atop a very old fan surface that is covered by intact desert pavement within an interface area between the fan piedmont and fan piedmont remnant geomorphic landforms. This indicates a Pleistocene (or older) period of formation (URS 2009). The desert pavement is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposing metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote, burroweed, ocotillo and cholla.

This lithic scatter site measures four meters northeast to southwest by three northwest to southeast, and contains a total of 37 prehistoric artifacts. The prevailing cultural constituents within this site consist of lithic reduction debitage. Artifact density at EBR-020 is moderate, with a calculated distribution of one artifact per 0.17 square meters. The overall condition of the site is fair with some alterations caused by off-highway vehicles in the eastern portion of the site.

This lithic scatter consists of 36 pieces of quartz lithic debitage, including eight flakes, 26 pieces of angular waste/shatter and two tested cobble fragments. The site also includes one quartzite hammerstone. The further character of artifacts within EBR-020 is unreported.

The more particular physical context for EBR-020, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within an interface area of the fan piedmont and fan piedmont remnant geomorphic landforms. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for Early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007); therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists of primary flakes, angular waste/shatter, tested cobbles, and a single hammerstone. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter and tools are of the same primary stone material (quartz and quartzite), are constituents of the surrounding area, and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent a single reduction locality or episode. It should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. EBR-020 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles in the interface between the fan piedmont and fan piedmont remnant geomorphic landforms. These geomorphic landforms indicate a Pleistocene (or older) period of formation, and because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits. Therefore, data potential is considered exhausted through recordation of EBR-020.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, EBR-020 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

EBR-023

EBR-023 is an oval-shaped prehistoric lithic scatter that covers a total surface area of 27 square meters. The site is located within the western portion of the 300 MW area of the Proposed IVS Project. The site is situated atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface of the site consists of heavily disturbed eroded desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles. The primary vegetation species observed on the site is creosote.

This lithic scatter site measures nine meters north northeast to south southwest by five meters north northwest by south southeast, and contains a total of 19 prehistoric artifacts. The prevailing cultural constituents within this site consist of prehistoric lithic reduction debitage. Artifact density at EBR-023 is low, with a calculated distribution of one artifact per 1.42 square meters. The overall condition of the site is poor due to several off highway vehicle tracks observed on and around the site.

The site consists of a total of 19 artifacts widely distributed throughout the site; which include 18 cryptocrystalline silicate flakes: 12 chalcedony (six primary, three secondary, one tertiary and two angular waste/shatter) and six chert (two primary, two secondary and two tertiary) and one cryptocrystalline silicate chalcedony multidirectional core. The further character of artifacts within EBR-023 is unreported.

The more particular physical context for EBR-023, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007) therefore there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature; debitage consists primarily of primary and secondary flakes, a single multi-directional core and angular waste/shatter. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone cryptocrystalline material that is a constituent of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent a single reduction locality or episode; but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. EBR-023 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform indicates a Pleistocene (or older) period of formation. Because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits; therefore, data potential is considered exhausted through recordation of EBR-023.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria. In addition, EBR-023 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

EBR-065

EBR-065 is an oblong-shaped prehistoric lithic scatter site that covers a total surface area of 538 square meters. The site is located within the eastern portion of the 300 MW area of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of highly disturbed desert pavement that is eroding but moderately stabilized in parts, namely the southwestern portion of the site, with poorly sorted small to large, sub-rounded to sub-angular metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial silts and sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote.

This lithic scatter site measures 58 meters north to south by 15 meters east to west, and contains a total of 61 artifacts (one historic and 60 prehistoric). It consists of two concentrations interpreted to be two single lithic reduction loci with 54 artifacts. Seven additional artifacts were observed outside the loci. The prevailing cultural constituents within this site consist of prehistoric lithic reduction debitage. Artifact density at EBR-065 is low, with a calculated distribution of one artifact per 8.8 square meters. The overall condition of the site is poor.

The site contains two lithic reduction loci and a total of 61 artifacts (54 associated with the loci), which include: 25 metavolcanic flakes (19 primary and six secondary), 11 metavolcanic shatter, 8 quartz flakes (three primary and five secondary), nine quartz shatter, two metavolcanic multi-directional cores, three metavolcanic hammerstones, one quartz mano, one metavolcanic edge modified flake, and one historic church key-opened beverage can.

Locus one is located at the north end of the site, 22 meters north-northeast of the small boulder sandstone datum and measures 8.7 meters east to west by 7.3 meters north to south. Artifacts observed within Locus one include: 22 green metavolcanic flakes (16 primary and six secondary), 10 green metavolcanic shatter, two green metavolcanic multidirectional cores, one green metavolcanic unifacial edge modified flake, one green metavolcanic hammerstone, and one heavily weathered quartz mano. All artifacts within Locus one exhibit substantial weathering or patination.

Locus 2 is located 52 meters south of Locus one and measures one meter east to west by one meter north to south. Artifacts observed within Locus 2 include: eight semi-translucent quartz flakes (three primary and five secondary) and nine semi-translucent quartz shatter.

Those artifacts observed within 30 meters and outside of the loci consist of: three green metavolcanic primary flakes, one green metavolcanic shatter, two green metavolcanic heavily battered hammerstones, and one historic church key-opened can that measures 2.75 inches diameter by 4.75 inches high. Also present outside the loci is a single modern 1970s-era can that was not included in the artifact counts.

The further character of artifacts associated with EBR-065 is unreported.

The more particular physical context for EBR-065, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007); therefore there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature characterized as: debitage dominated by primary and secondary flakes, two multi-directional cores with little cortex, angular waste/shatter, one edge modified flake, and three hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same two primary stone materials (metavolcanic and quartz) that are typical constituents of the surrounding area lithology and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent two single reduction localities or episodes, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Additionally, archaeologists for the applicant interpret ground stone tools such as the single mano present at EBR-065 to be evidence of resource processing. Ground stone tools were made by grinding, abrading, pecking, pounding, and polishing rather than chipping and flaking. Ground stone tools found in the area surrounding EBR-065 include manos, metates (sometimes referred to as milling stones) and pestles. Metates in this area are typically flattish slabs, manos were smaller, soap and loaf-shaped stones that were moved in a circular motion against the metate, in order to grind small seeds and other food resources; pestles were elongated, club-shaped stones used for pounding and grinding in a mortar. Manos, metates, and pestles were primarily constructed from coarse-grained stone such as sandstone or granite. Less frequent groundstone material sources, but still common in the area, are quartzite and quartz (mano located in Locus 1), which are more durable and can still be rejuvenated. Mortars in desert environments absent of large coarse bedrock outcrops were made from cottonwood. Manos, metates, and pestles are associated with subsistence procurement and/or processing (Chartkoff and Chartkoff 1984).

The presence of flaked stone tools such as the single edge-modified flake found within EBR-065 represents resource procurement and/or processing of faunal or floral resources. The creation of flaked stone tools requires additional lithic technologies, possible including bifacial thinning and pressure flaking to shape and refine cutting edges. The presence of tertiary flakes and angular waste/shatter of metavolcanic material, like the edge-modified flake, may account for such activities.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. EBR-065 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform indicates a Pleistocene (or older) period of formation. Because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits. Therefore data potential is considered exhausted through recordation of EBR-065. Furthermore, the poor condition of the site due to disturbances associated with off- highway vehicle activity has greatly reduced its integrity.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, EBR-065 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

JF-006

JF-006 is an amorphous-shaped historic refuse and historic/modern rock cluster site that covers a total surface of 567 square meters. The site is located within the western portion of the 300 MW area of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of disturbed desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. The site has been disturbed from off-highway vehicle (OHV) usage and is within an area that has been mechanically cleared (surface/gravel mining area that has been graded). Small piles of gravel are noted north and south of the site. A two-track OHV track goes through the northwest portion of the site. Vegetation species on the site include creosote and bunch grass.

This historic/modern rock cluster and historic refuse deposit site measures 49 meters north to south by 54 meters east to west, and contains a total of three historic artifacts. The prevailing cultural constituents within this site consist of historic artifacts and three rock cluster features. Artifact density at JF-006 is low, with a calculated distribution of one artifact per 189 square meters. The overall condition of the site is fair.

This site contains three historic artifacts consisting of one church key opened half quart beer can labeled "Pale Ale Brew", one church key opened beverage can, and a metal socket wrench. Also present are three potentially modern rock clusters (one with a survey stake and wire nail). The further character of artifacts associated with JF-006 is unreported.

Feature one consists of a potentially modern rock cluster measuring 56 inches in diameter by 8 inches high and is located eastern side of the central portion of the site. The rock cluster is constructed from 60 metavolcanic cobbles; the diameter of rocks used range from three inches to 10 inches. The rock cluster is in fair condition.

Feature 2 consists of a potentially modern rock cluster measuring 34 inches in diameter by four inches high and is located 45 feet southeast of Feature 1. The rock cluster is constructed from 28 sub-rounded to sub-angular metavolcanic cobbles; the diameter of rocks used range from two inches to nine inches. This rock cluster is in fair condition and has an associated wooden stake with a wire nail embedded in it.

Feature 3 consists of a potentially modern rock cluster measuring 40 inches in diameter by eight inches high and is located 106.5 feet east of Feature 2. The rock cluster is constructed from 40 sub-rounded metavolcanic cobbles; the diameter of rocks used range from 2.5 inches to 10 inches. The rock cluster is in fair condition and is filled with compacted sand.

The more particular physical context for JF-006, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007) therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret that although the rock clusters present at JF-006 have characteristics similar to survey markers in the area, they cannot be conclusively identified as such. The size of the clusters and of the stones that comprise them conform approximately to those surrounding General Land Office survey bench markers found in the surrounding region; however, the feature is not located on a current section or quarter section corner point. Additionally, expediently constructed stone clusters can also be markers of mining claims or homestead boundaries. Mining claim markers sometimes contain tobacco tins to hold copies of official records substantiating the claim. Such a tin was not evident at this stone cluster. The site is situated within a large recreational area which is frequently used by off-highway vehicles. It is possible that the stone cluster is modern in age and perhaps was expediently placed to provide a visible landmark to facilitate navigation.

Temporally diagnostic artifacts present at the site include two church key opened beverage cans. These cans were opened with a large (3/4") church key which was a style popular between 1935 and 1952 (Goodman 2002). The third artifact, a socket wrench, had no observed diagnostic characteristcs.

Archaeologists for the applicant interpret that deposits of historic artifacts such as the ones found at JF-006 typically represent episodes of refuse disposal after initial discard in another location (dumping) or discard and/or loss of individual articles in-situ. In the case of JF-006, the small number of artifacts and artifact types present would more likely have resulted from in-situ disposal rather than dumping of wide range of artifact types that would be expected in an assemblage of common household refuse. Though approximate dates of consumption can be determined for two of the artifacts present at JF-006, the time between the initial use/consumption of the artifacts and their ultimate disposal cannot be known so the specific date of their disposal cannot be reliably determined.

This site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. JF-006 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits, therefore, data potential is considered exhausted through recordation of JF-006.

As a result, JF-006 is recommended not eligible for the National Register and is not a historical resource pursuant to National Register and California Register under any of the criteria for eligibility.

JFB-010

JFB-010 is a circular-shaped archaeological deposit that includes both prehistoric and historic components and covers a total surface area of 44 square meters. The site is located within the western portion of the 300 MW area of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of heavily disturbed desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote.

This archaeological deposit measures 16 meters northwest to southeast by 4 meters northeast to southwest, and contains a total of seven prehistoric artifacts. The prehistoric component consists of one concentration interpreted to be a single reduction lithic locus with seven artifacts. The historic component consists of one concentration interpreted to be one feature, a brass cap survey benchmark. The prevailing cultural constituents within this site consist of prehistoric artifacts. Artifact density at JFB-010 is low, with a calculated distribution of one artifact per 6.3 square meters. The overall condition of the site is poor due to gravel mining disturbance.

This site contains one single reduction locus, an historic feature and a total of seven artifacts, which include: one quartzite hammerstone, six metavolcanic flakes (four primary and two secondary) and a historic feature consisting of an undated brass survey benchmark.

Feature one is located in the northwest portion of the site. Feature one consists of an undated historic brass survey benchmark. The benchmark is stamped "SURVEY POINT DO NOT DISTURB/PT/C".

Locus one is located 12.4 meters southeast of Feature one and measures 1.5 meters east to west by one meter north to south. Artifacts observed within Locus one include one quartzite hammerstone and six green metavolcanic flakes (four primary and two secondary).The area within 30 meters and outside the locus and feature is void of artifacts. The further character of artifacts found within JFB-010 is unreported.

The more particular physical context for JFB-010, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for Early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007); therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

This prehistoric component of this site represents an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature; debitage consists primarily metavolcanic flakes and a quartzite hammerstone. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic reduction site are of the same primary stone (metavolcanic) material that is a constituent of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent a single reduction locality or episode. It should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

General Land Office (GLO) cadastral benchmarks such as the one found in JFB-010 were placed by surveyors as a part of the Public Lands Survey System (PLSS). That system divided public lands into sections of one square mile (640 acres) and into quarter sections of 160 acres. The PLSS was created by the Land Ordinance of 1785, which declared that lands outside the then-existing states could not be sold, otherwise distributed, or opened for settlement prior to being surveyed (Stewart 1935). Along with the Homestead Act of 1862 and the Desert Land Act of 1877, the PLSS helped facilitate the U.S. expansion westward in the late 19th and early 20th centuries.

The specific markings stamped into the brass cap of this particular benchmark do not include the date that the benchmark was placed nor are they consistent with section corner markers or quarter section markers observed within the Project area. Other GLO benchmarks in the area are dated 1912. According to the GLO's 1902 instruction manual for surveyors, the stamped inscription "PT" is consistent with what would be expected of a point of triangulation, which is a control point used in the process of placing corner benchmarks (White 1991).

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction; and analysis of artifact distribution has been accounted for during the recordation process. JFB-010 is situated within an active wash within the fan piedmont. This geomorphic landform indicates a Pleistocene (or older) period of formation. Because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits. Areas of active erosion within the fan piedmont, such as where this site is located, do have a slightly greater potential for the presence of subsurface archaeological deposits where recent alluvium has been deposited. Given the highly erosive nature of active washes within the fan piedmont, it seems unlikely that such subsurface deposits would have been preserved. Furthermore, if subsurface cultural deposits were to be preserved under such isolated inset pediments, they will most likely be similar in quality and quantity of artifacts to those sites found on the surface in nearby remnant portions of the fan piedmont (URS 2009: CUL-8). Therefore, data potential is considered exhausted through recordation of JFB-010.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, JFB-010 is not considered a contributor to an existing and/or proposed archaeological district or landscape. Destruction of GLO benchmarks is still prohibited under federal law; therefore it is recommended that the bench mark be left undisturbed during construction activities.

RAN-022

RAN-022 is an amorphous-shaped archaeological deposit that includes both prehistoric and historic components and covers a total surface area of 55,736 square meters. The site is located within the central portion of the 300 MW area of the proposed IVS Project. It is situated atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The ground surface of the site consists of areas of highly disturbed desert pavement that appear in some parts to have been removed by surface scraping and pushing in the process of gravel mining, and/or damaged by off-highway vehicle use. In the parts of the site where the desert pavement is intact, it is well developed and highly deflated with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils at the site are primarily alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote, cholla, ocotillo, bunchgrass and mesquite.

This archaeological deposit measures 423 meters northeast to southwest by 285 meters east to west. The prehistoric component is primarily composed of extremely small, angular lithic material described as tertiary flakes or angular waste/shatter that were far too numerous to make a complete count practical. In order to address that issue, six Surface Sample Units (SSU), each measuring two meters by two meters, and a seventh measuring one meter by one meter, were laid out and artifacts within those units were counted. Within those seven sample units were 1,300 artifacts. The density of those sample units ranges from high, at one artifact per 0.006 square meters (157 artifacts per square meter) to low, at one artifact per four square meters (0.25 artifacts per square meter). The overall average density of the SSUs is moderately high, at one artifact per 0.019 square meters (52 artifacts per square meter).

The historic component consists of six features, seven concentrations (loci), one circular concrete structure foundation with approximately 1,512 total artifacts within loci and features, and approximately 878 additional artifacts observed outside the loci and features. The density of historic artifacts at RAN-022 is one artifact per 23.32 square meters (0.043 artifacts per square meter).

Historic artifacts present at RAN-022 include: 19 small hole-in-cap cans, two large matchstick filler cans, 47 sanitary food cans, 123 unidentifiable metal can fragments, 35 tobacco tins, 35 crockery fragments, 47 aqua bottle glass fragments, nine brown glass fragments, 30 long cylindrical cans, one small condensed milk can (matchstick filler), one aqua bottle glass base with "A-1 Steak Sauce" embossed on it, and three sanitary condensed milk cans, 13 metal bucket/barrel rings, one metal pulley wheel, approximately 80 fragments of window and bottle glass, three crushed cans, four springs, 10 dishware fragments; white with green writing "johnson...England", three metal fragments, 10 bolts, four manganese decolorized glass fragments, and two large batteries, 329 plus nails, wire mesh, approximately 100 pieces of small to large mammal cut bone, and a double ended wrench, one horseshoe, two belt buckles, nine pieces of wire, one chain, two screws, one piece milled wood, 11 copper washers, nine copper rivets, three belt buckles, nine pieces of wire, one bottle opener, one steak knife, and one historic olive glass body shard with edge modification.

Historic artifacts located within 30 meters and outside identified features and loci include: 10 small matchstick filler cans with solder dot, 22 large matchstick filler cans, seven small and 19 large hole in cap cans with solder ring and dot, 39 sanitary cans (seven small and 27 large), 107 unidentifiable cans, three rectangular cans, one rectangular hole in cap can, two long cylindrical sanitary cans (six inch diameter by 9.750 inches), five small condensed milk cans, three church key opened beverage cans, one belt buckle, five bolts, 62 hinged-lid tobacco tins, three crushed buckets, eight paint cans, one gas can with a wire handle, one saw blade, three bottle caps, one turnkey, three washers, six metal barrel/ bucket rings, one chain link, two horseshoe fragments, six latch hooks, 145 pieces of wire, 43 small round nails, 76 small to large round nails, three lids, one stove pipe, one metal spring, one metal ring, two oil cans with friction cap, and one friction lid oval can (2.5 inch diameter by 3.875 inch length).

Prehistoric artifact types and materials represented at RAN-022 include: green metavolcanic (54 primary, 50 secondary, 1001 tertiary flakes, 26 pieces of angular waste/shatter, and six multidirectional cores), quartzite (five primary, six secondary, and nine tertiary flakes, one piece of angular waste/shatter, and one multidirectional core fragment), cryptocrystalline silicate (two secondary and five tertiary flakes, three pieces of angular waste/shatter, and one multidirectional core), black metavolcanic (16 primary, nine secondary, and 41 tertiary flakes, and 12 pieces of angular waste/shatter), basalt (three primary, three secondary, and five tertiary flakes, one edge modified secondary flake, one pieces of angular waste/shatter, and one multidirectional basalt core), silt stone (three tertiary flakes), red/brown metavolcanic (one large tertiary flake and one piece of angular waste/shatter), quartz (six primary, four secondary, and six tertiary flakes and 26 pieces of angular waste/shatter), and one piece of petrified wood angular waste/shatter.

The six features are interpreted to be historic in age and are described as follows:

Feature one is located within southwestern portion of site and measures 17 feet northeast to southwest by 22 feet northwest to southeast. Feature one is a square-shaped clearing outlined with 50 large rocks and several hundred small rocks. There are round nails located within the feature and a large tent stake nearby, indicating that this clearing was for a tent structure.

Feature 2 is located 15 meters north of Feature one and measures 75 inches north to south by 75 inches east to west. Feature 2 is interpreted to be a fire feature consisting of 95 fragments of medium-large mammal bone (many exhibiting processing marks), three pieces of fire affected rock, 15 round head nails, and two pieces of wire.

Feature 3 is located five meters west of Feature 2 and measures 37 inches north to south by 65 inches east to west. Feature 3 is interpreted to be a fire feature consisting of six pieces burnt mammal bone, approximately 50 round nails, and 10 or more pieces fire-affected rock.

Feature 4 is located three meters northwest of Feature 3, within Locus 4, and measures 92 inches north to south by 83 inches east to west. Feature 4 is interpreted to be a fire feature consisting of 10 or more pieces of fire affected rock, one nut and bolt, and a scatter of approximately 105 nails.

Feature 5 is located 176 meters northeast of Feature 4 and measures 90 inches in diameter. Feature 5 is an historic circular concrete foundation. Feature 5 is fractured along its southern portion.

Feature 6 is located 173 meters east of Feature 5 and measures 21 inches long by 16 inches wide by 9 inches high. Feature 6 is a rock cluster that contains 12 rocks (quartz, porphyritic metavolcanic, and granitic cobbles). Feature 6 is likely recent due to the fact that there is no desert sheen or weathering of the rocks in place.

The eight loci identified are comprised primarily of historic artifacts and are described below:

Locus one is located within the eastern portion of the site and measures 23 meters southwest to northeast by 10 meters northwest to southeast. Artifacts observed within Locus one include: 19 small hole-in-cap cans, two large matchstick filler cans, 47 sanitary food cans, 102 unidentifiable metal can fragments, 13 tobacco tins, 12 crockery fragments, 28 aqua bottle glass fragments, nine brown glass fragments, 30 long cylindrical cans, one small condensed milk can (matchstick filler), one aqua bottle glass base with "A-1 Steak Sauce" embossed on it, and three sanitary condensed milk cans.

Locus 2 is located 63 meters southeast of Locus one and measures 13 meters north to south by 16 meters east to west. Locus 2 is a low density concentration of nine metal bucket/barrel rings, one metal pulley wheel, approximately 80 fragments of window and bottle glass, one crushed can, four springs, 10 dishware fragments; white with green writing "johnson...England", three metal fragments, 10 tobacco tins, three bolts, 30 plus nails, four manganese decolorized glass fragments, and two large batteries.

Locus 3 is located 67 meters northeast of Locus 2 and measures 760 centimeters northeast to southwest by 575 centimeters. Within Locus 3 are three tobacco tins, two crushed cans and three metal bucket barrel rings.

Locus 4 is located 16 meters southwest of Locus 3 and measures nine meters north to south by 11 meters east to west. Locus 4 is a concentration of historic refuse containing 19 fragments of Aqua bottle glass, 200 plus round nails, wire mesh, one large bolt, one barrel/bucket ring, 23 tan crockery fragments, approximately 100 pieces of large mammal bone, two hinged tobacco tins and a double ended wrench.

Locus 5 is located 120 meters southeast of Locus 4 and measures 660 centimeters north to south by 660 centimeters east to west. Locus 5 is a scatter of nails and metal scraps containing 35 plus large round nails, 40 plus small nails, one horseshoe, two belt buckles, 21 unidentifiable metal fragments, seven hinged tobacco tins, nine pieces of wire, one chain, two screws, six bolts, two pieces of aluminum wire, one piece milled wood, one washer and two metavolcanic flakes (one secondary and one fine grained tertiary).

Locus 6 is located 98 meters north of Locus 5 and measures 640 centimeters east to west by 515 centimeters north to south. Locus 6 is a concentration of ferrous metal wire and one large sanitary can. Metal wire from this locus is displaced throughout the site.

Locus 7 is located 20 meters west of Locus 6 and measures 515 centimeters east to west by 485 centimeters north to south and is a concentration of metal hardware including: 10 copper washers (0.4375 inch diameter by 0.0312 inches thick), nine copper rivets (0.5 inch diameter 0.375 inch by 0.75 inch), three belt buckles, nine pieces of wire, one bottle opener, 15 large nails, seven small nails and one steak knife.

Locus 8 is located 160 meters south of Locus 7 and measures 370 centimeters north to south by 180 centimeters east to west and is a quartz lithic scatter containing four primary flakes, four secondary flakes, four tertiary flakes and 26 shatter.

The site also contains 599 historic artifacts not located within features or loci. These include: 10 small matchstick filler cans with solder dot, 22 large matchstick filler cans, seven small and 19 large hole in cap cans with solder ring and dot, 39 sanitary cans (seven small and 27 large), 107 unidentifiable cans, three rectangular cans, one rectangular hole in cap can, two long cylindrical sanitary cans (six in diameter by nine and 0.750), five small condensed milk cans, three church key opened beverage cans, one belt buckle, five bolts, 62 hinged-lid tobacco tins, three crushed buckets, eight paint cans, one gas can with a wire handle, one saw blade, three bottle caps, one turnkey, three washers, six metal barrel/bucket rings, one chain link, two horseshoe fragments, six latch hooks, 145 pieces of wire, 43 small round nails, 76 large nails, three lids, one stove pipe, one metal spring, one metal ring, two oil cans with friction cap, and one friction lid oval can (2.5 inch diameter by 3.875 inch length).

The Surface Sample Unit inventories yielded primarily prehistoric artifacts and are described as follows:

Surface Sample Unit 1, located in the eastern portion of the site, is a two by two meter unit aligned on a bearing of 339 degrees. Surface Sample Unit 1 contains several lithic materials including: green metavolcanic (18 primary flakes, five secondary, and 440 tertiary flakes smaller than one centimeter in diameter, 84 tertiary flakes larger than one centimeter in diameter, three shatter and two multidirectional cores), quartzite (one primary flake, four secondary, three tertiary flakes smaller than one centimeter, two tertiary flakes larger than one centimeter and one multidirectional core fragment), cryptocrystalline silicate (four tertiary flakes smaller than one centimeter, one tertiary flake larger than one centimeter, two pieces of angular waste/shatter, and one multidirectional core), black metavolcanic (six primary flakes, five secondary flakes, 15 tertiary flakes smaller than one centimeter diameter, 12 tertiary flakes larger than one centimeter diameter, and five shatter), basalt (three primary flakes, three secondary flakes, one tertiary flake less than one centimeter in diameter, four tertiary flakes greater than one centimeter in diameter, and one shatter), silt stone (one tertiary flake larger than one centimeter in diameter). There are a total of 628 artifacts, with a density of one artifact per 0.0064 square meters (157 artifacts per square meter).

Surface Sample Unit two is located 27 meters east of Surface Sample 1 and is a two by two meter sample area aligned on a bearing 349 degrees. Surface Sample 2 is very sparse with one historic olive glass body shard with edge modification, one green metavolcanic shatter and two modern nails. Prehistoric artifact density of this sample is recorded as one artifact per two square meters (0.25 artifacts per square meter).

Surface Sample Unit 3 is located 24 meters east of Surface Sample 2 and is a two by two meter surface sample unit aligned on a bearing of 32 degrees. Surface Sample 3 contains several material types including green metavolcanic (17 primary flakes, 14 secondary flakes, 209 tertiary flakes smaller than one centimeter in diameter, 60 tertiary flakes greater than one centimeter in diameter, 16 pieces of shatter), black metavolcanic (nine primary flakes, two secondary flakes, 14 tertiary flakes larger than one centimeter and seven pieces shatter), cryptocrystalline silicate (two secondary flakes and one piece of shatter), red/brown metavolcanic (one large tertiary flake and one piece of shatter), quartzite (three primary flakes, one secondary flake, one small tertiary flake smaller than one centimeter in diameter, three larger tertiary flakes and one piece of shatter. Basalt: one edge modified secondary flake), siltstone (two small tertiary flakes smaller than one centimeter in diameter). Total artifact count for Surface Sample 3 is 258, with a prehistoric artifact density of one artifact per 0.016 square meters (64.5 artifacts per square meter).

Surface Sample Unit 4 is located to 26 meters southeast of Surface Sample 3 and is a one by one sample unit aligned on a bearing of 69 degrees. Surface Sample 4 contains green metavolcanic material (52 green metavolcanic tertiary flakes smaller than one centimeter in diameter and three green metavolcanic shatter) and one piece of petrified wood angular waste/shatter. This surface sample includes 60 total prehistoric artifacts with a density of one artifact per 0.017 square meters (57 artifacts per square meter).

Surface Sample Unit 5 is located 65 meters north of Surface Sample 4 and is a two by two meter sample unit aligned on a bearing of 21 degrees. This sample contains two materials; green metavolcanic (one primary flake, five tertiary flakes smaller than one centimeter diameter, and two pieces of angular waste/shatter), with one multidirectional basalt core. There are nine total artifacts, with a density of one artifact per 0.444 square meters (2.25 artifacts per square meter).

Surface Sample Unit 6 is located 30 meters east of Surface Sample 5 and is a two by two meter sample unit containing three different materials including green metavolcanic (16 primary, 29 secondary, 146 tertiary flakes and four multidirectional cores), quartz (two primary flakes and two tertiary flakes), quartzite (one primary flake and one secondary flake). Surface Sample 6 contains 203 total artifacts, with a density of one artifact per 0.197 square meters (50.75 artifacts per square meter).

Surface Sample Unit 7 is located 40 meters east of Surface Sample 6 and is a two by two sample unit containing two materials including green metavolcanic (two primary flakes, one secondary flake, three tertiary flakes less than one centimeter in diameter and one tertiary flake larger than one centimeter in diameter) and black metavolcanic (one primary and two secondary flakes). There are 10 total artifacts, with a density of one artifact per 0.4 square meters (2.5 artifacts per square meter).

The further character of artifacts found within RAN-022 is unreported.

The more particular physical context for RAN-022, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont. The desert pavement throughout much of the site is highly disturbed due to mechanical abrasion that appears to be a result of gravel mining and off-highway vehicle activity.

Though research into particulars about this site has uncovered no written records to describe past occurrences at RAN-022, the data recorded from the artifacts present, the composition of the artifact assemblage, and its distribution can be used to reconstruct at least some of its historic component.

The historic era artifacts and artifact types present would more likely have resulted from in-situ disposal rather than large-scale dumping. Though date ranges of manufacture can be determined for some of the artifacts present at RAN-022, the time between their manufacture, the use/consumption of the artifacts, and their ultimate disposal cannot be known, so the specific date of their disposal cannot be reliably determined. However, those date ranges obtained should provide a relatively close approximation of the dates of occupation at the site.

A wide variety of historic era artifacts were found at RAN-022 for which approximate date ranges of manufacture could be determined. For example, hole-in-cap cans such as the lap-seam cans present at this site were initially introduced in the mid-19th century and were common in the late 19th to early 20th century, but fell out of favor in the 1920s when most manufacturers switched to sanitary cans. In the western United States, sites such as this where sanitary cans outnumber hole-in-cap cans typically date to post 1922 (Goodman 2002).

Also present at this site are transparent glass fragments of a particular light purple color that is temporally diagnostic. Beginning circa 1880 manganese was added to glass to change its natural aqua color to clear. That addition had the unintended effect of turning the glass a particular amethyst color when exposed to ultraviolet light for extended periods of time. Such glass is termed "sun-colored-amethyst" glass (SCA) (Goodman 2002:1) and its manufacture predates 1920, when the practice of adding manganese ended.

Numerous straight-sided tobacco tins with oval bases and hinged lids are present at RAN-022. Tobacco tins of that style were common just after the turn of the 19th to 20th century and continued in production until R.J. Reynolds switched from cans to paper and plastic pouches in 1988 (Rock 1988).

Also identified were glass bottle shards of a particular aqua color that became common between 1880 and 1920 (Goodman 2002). One of those artifacts is an aqua glass bottle base fragment with a reverse embossed capital "B" that is part of the maker’s mark for Boldt Glass Company. The Boldt Glass Company began in 1900 and had a severe drop in sales with the advent of national Prohibition (ca. 1919) because most of its contracts were for alcoholic beverage bottles. The company later fell victim to the great depression and was taken over in 1926 by Owens Glass Company. Because the pontil scar is centered on the bottle base, it is determined that this bottle was hand blown with the use of a mold, indicating that it was manufactured before 1909 when the Boldt Company installed Owens automatic bottle making machines, thereby eliminating hand blowing (Lockhart et al. 2007). Therefore, the particular bottle base found at RAN-022 was manufactured between 1900 and 1909.

Nails on site are exclusively modern wire nails; modern nails began circulation in 1850 and continue to be used up to the present day (IMACS 2001). All nails found at RAN-022 were manufactured from wire, indicating that the site dates to post 1902 (Goodman 2002).

Additionally, shell buttons recorded on site post date 1855 (Goodman 2002) and flat top beverage cans with large (3/4”) church key openings were found that have an associated date range of 1935 to the 1950s (Goodman 2002).

Based on the date ranges described above, it can be inferred that there was an episode of occupation/activity at RAN-022 that began sometime after 1900 and extended through approximately 1935 and perhaps into the 1950s.

RAN-022 appears to have primarily been a gravel mining location with some amount of limited habitation at some point or points in time. Many of the artifacts as an assemblage represent the debris that would be expected from the remains of a tent house or other, less formal structure. The most conspicuous evidence is a 17 by 22 foot cleared area of ground that is lined with rocks. Present also are a multiplicity of wire nails, fragments of milled lumber, latch hooks, etc., that would have likely been components of a structure. Absent are artifacts that would be expected from a more permanent structure, such as roofing material and siding, therefore the structure was likely a large, wood-framed tent.

Also present are artifacts that would be expected from an early 19th century commercial operation or perhaps farm, and any habitation at the site would likely have been made by a small group of people, and/or in short episodes. Artifacts within the assemblage include: ferrous wire, wire mesh, large batteries, copper rivets, oil cans, a pulley wheel, and fragments of horse shoes. Conspicuously underrepresented in the assemblage are artifacts that give evidence of family life over longer periods of time. Among the refuse are multiple milk cans and food tins but virtually no kitchen spices, and kitchen utensils present are limited to a single table knife and a skillet. Also underrepresented are artifacts particularly attributed to women or children. The assemblage does include a single porcelain doll leg but no other toys or game pieces. A brush and a fragment of an ivory comb are present, but those could have been used by men as well as women. Though the horse shoes could have come from farm animals, draft animals could also have been used to transport gravel or for personnel transportation to and from the site. Still, even though the majority of historic era artifacts at RAN-022 seem to indicate the predominant activities that took place there were connected with gravel mining, from the limited household debris present, it does seem that at least short term, likely episodic habitation, perhaps including women and children for short periods of time, took place there. An alternative interpretation might be that the site was occupied, possibly by a family, sometime during the 1920s to 1930s and that most of the evidence of that habitation was obliterated later by a gravel mining operation.

A peculiar characteristic of the assemblage at RAN-022 is that it contains huge numbers of angular shatter and tertiary flakes smaller than one centimeter in diameter. The majority of these thousands of flakes appear to have resulted from angular fractures and all lack cortex. It seems unthinkable that any flint knapping activity could have produced such a large assemblage of predominantly angular waste/shatter with relatively few other flakes. Therefore, it is likely that the majority of the shatter/tertiary flakes present at RAN-022 were created during historic times by mechanical rock crushing associated with a gravel mining operation. Gravel is a high volume/low cost commodity, so it is uneconomical for it to be transported great distances. Therefore, surface and open pit gravel mines typically crushed and processed gravel in order to conform to the standards of the end user which then transported the gravel and aggregate to local construction sites and road building operations (MSU 2009).

Adding to the complexity of interpreting RAN-022 are artifacts indicating that activities took place there during prehistoric, protohistoric, or early historic times. Though the majority of the lithic artifacts present are small angular shatter and tertiary flakes that likely resulted from commercial gravel processing, there are clearly identifiable primary, secondary, and tertiary flakes, cores, and angular waste/shatter that have characteristics that indicate that they are the products of flint knapping, during prehistoric times. Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret the prehistoric component of this site as an expedient tool technology locality (Jones and Klar 2007). Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced at RAN-022 are of the same primary stone materials (metavolcanic, cryptocrystalline silicate, quartzite, and basalt) that are constituents of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent several single reduction localities or episodes, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Of particular interest is a single shard of hand-blown, deep olive green bottle glass with very heavy surface patina that is present. This type of glass typically dates to between 1815 and 1885 (Goodman 2002). What is particularly interesting about this shard is that one edge has been worked though pressure flaking to create a sharper, serrated edge, in a process that almost solely performed in flint knapping. Because of the combination of typically Native American flint knapping techniques on a historic era bottle, it can be inferred that this artifact dates to protohistoric or early historic era.

Therefore, the portrait of RAN-022 that results is a palimpsest of activities and occupation over time. It was first a place of expedient stone tool material acquisition and production occurring sometime between prehistoric and early historic times. Later, beginning sometime after the 1920s, the site was occupied. At some point women and children were there, but if and for how long they lived there is unclear. There was an informal tent structure that likely measured 17’ x 22’. Meals were likely cooked and served there. The site was occupied during the historic period for episodes beginning sometime after 1900 and perhaps extending into the 1950s, with the bulk of activities taking place roughly in the 1920s to 1930s. At some point or perhaps throughout the history of the site the major activity there was gravel mining, which included processing.

Even though this site possesses temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history.

Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. RAN-022 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits, therefore data potential is considered exhausted through recordation of RAN-022.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, RAN-022 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

RAN-025

RAN-025 is an amorphous-shaped lithic scatter that covers a total surface area of 458 square meters. The site is located within the western portion of the 300 MW area of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of an older fan surface ridge-top covered by intact desert pavement that is well developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. The active gully (wash) area is approximately 100 meters east of the site. Vegetation species on the site include desert trumpet and Rayless Encelia.

This lithic scatter site measures 35 meters northwest to southeast by 18 meters northeast to southwest, and contains a total of seven prehistoric artifacts. The prevailing cultural constituents within this site consist of prehistoric artifacts. Artifact density at RAN-025 is low, with a calculated distribution of one artifact per 65.43 square meters. The overall condition of the site is good with disturbances attributed to natural deflationary and erosional processes.

This site contains a total of seven artifacts, which include: one metavolcanic secondary flake, three tested metavolcanic cobbles, and three metavolcanic hammerstones. The further character of artifacts found within RAN-025 is unreported.

The more particular physical context for RAN-025, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature; debitage consists of primarily tested cobbles with hammerstone. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone (metavolcanic) material that is a constituent of the surrounding area (and exhibit expedient lithic reduction methods of percussion reduction processes), the site appears to represent one single reduction locality or episode, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

This site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. RAN-025 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits, therefore data potential is considered exhausted through recordation of RAN-025.

Based on its potential to provide data regarding regional prehistory, RAN-025 is recommended not eligible for the National Register and is not a historical resource pursuant to National Register and California Register under any of the criteria for eligibility. Based on geographic location and characteristics of the artifact assemblage at RAN-025, it is recommended as potentially contributing to the Yuha Basin Discontiguous Archaeological District.

RANA-003

RANA-003 is an amorphous-shaped historic site that covers a total surface area of 1,416.39 square meters. The site is located within the western portion of the 300 MW area of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of an open, elevated, older fan surface covered by heavily disturbed desert pavement that is moderately developed in undisturbed areas. The pavement consists of small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site includes creosote.

This historic site measures 112 meters east to west by 81 meters north to south, and contains 30 artifacts associated with a single surface depression feature (Feature 1). It consists of widely dispersed historic artifacts associated with what is interpreted to be an historic period bomb/mortar crater depression feature. The prevailing cultural constituents within this site consist of historic artifacts. Artifact density at RANA-003 is low, with a calculated distribution of one artifact per 47.2 square meters. The overall condition of the site is very poor and exhibits heavy mechanical surface disturbance with large cleared areas of pavement and push piles. There is also a linear path along the southeastern portion of the site, which appears to be a result of heavy equipment as well. The path has likely been cleared by equipment (ex. backhoe) which may have caught a boulder and dragged it across the surface directly toward the nearest access road.

This site contains one feature (Feature 1) and a total of 30 metal shrapnel fragments.

Feature 1 is centrally located within the site and consists of a historic-period bomb/mortar crater that measures 16 feet in diameter by two feet in depth. Seven of the 30 shrapnel fragments were mapped to provide a sample distribution pattern of the extant of mortar/bomb debris upon impact. The majority of metal shrapnel is located within 25 to 50 feet of the crater. The majority of shrapnel is located within nine meters of the bomb/mortar crater. Thirteen of the fragments are located within the crater. The further character of the artifacts associated with RANA-003 is unreported.

The more particular physical context for RANA-003, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Due to the stability of this landform throughout history there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont. Though highly disturbed by mechanical activity that may have occurred prior to or after the crater, it does not appear to be associated with the feature. Portions of the surface have intact pavement that is moderately stabilized with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite and granite gravels and cobbles.

RANA-003 appears to be a crater formed by the detonation of an explosive device. As none of the artifacts present have any temporal or functional characteristics, the general form and arrangement of the site leads to a tentative interpretation as a location of an experimental aircraft escape system or bombardier/gunnery practice. Prior to becoming a Naval Air Station in 1946, nearby Naval Air Facility El Centro was a Marine Corps Air Station which served as a marine bombardier and gunnery school that trained enlisted gunners and bombardiers. Starting in 1947, the facility was used for aeronautical escape system design, evaluation, and testing. Experiments involving low altitude parachute escape systems were conducted throughout the surrounding desert at that time. During the late 1950s testing of ejection seat technology began. By 1979 design and testing operations were moved to other facilities and the El Centro Naval Air Base primarily focused on training military operatives (US Army 1999).

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot conclusively be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. RANA-003 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform has a very low likelihood for subsurface archaeological deposits; therefore, data potential is considered exhausted through recordation of RANA-003.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, RANA-003 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

SM-003

SM-003 is an amorphous-shaped prehistoric lithic scatter that covers a total surface area of 1,075 square meters. The site is located in the western portion of the 300 MW area of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface of the site consists of a raised very old fan surface covered by moderately developed desert pavement with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles. The predominant vegetation on the site include creosote, burroweed, desert lily and bunch grass.

This lithic scatter measures 50 meters northeast to southwest by 31 meters northwest to southeast, and contains a total of 159 artifacts. The site consists of five concentrations of lithic artifacts interpreted to be single reduction loci with a combined total of 150 artifacts; plus an additional eight artifacts found outside the loci within 30 meters. The prevailing cultural constituents consist of prehistoric lithic debitage. Artifact density is low, with a calculated distribution of approximately one artifact per 18.5 square meters. The overall condition of the site is good with some alterations from off-highway vehicles, ephemeral gullies that run in a northeast to southwest direction, and an active wash east of the site.

SM-003 consists of five single reduction loci, with a combined total of 159 artifacts recorded across the site. Artifacts include: 58 metavolcanic flakes (13 primary, 14 secondary, 23 tertiary, and eight shatter), 75 quartz flakes (nine primary, six secondary, 31 tertiary, and 29 shatter), 11 petrified wood flakes (four primary, two secondary, and five shatter), six cryptocrystalline silicate chert flakes (one primary, three secondary, and two shatter); three multi-directional cores (two metavolcanic and one cryptocrystalline silicate chert); one bi-directional metavolcanic core, one metavolcanic tested cobble and four hammerstones (three metavolcanic and one basalt).

Locus 1 is located two meters east of the westernmost site boundary and measures two meters north to south by two meters east to west. Artifacts observed within Locus 1 include: 16 green gray metavolcanic flakes (three primary, one secondary, and 12 tertiary), one bidirectional core and one metavolcanic hammerstone.

Locus 2 is located 26 meters southeast of Locus 1 and measures three meters northeast to southwest by two meters northwest to southeast. Artifacts observed within Locus 2 include: 72 quartz flakes (nine primary, three secondary, 31 tertiary, and 29 shatter), one multidirectional core and one basalt hammerstone.

Locus 3 is located 30 meters northeast of Locus 2 and measures three meters northeast to southwest by one meters northwest to southeast. Artifacts observed within Locus 3 include: 39 gray metavolcanic flakes (10 primary, 11 secondary, 11 tertiary, and seven shatter), one multidirectional core and one metavolcanic tested cobble.

Locus 4 is located 17 meters northeast of Locus 3 and measures one meters northeast to southeast by one meters northeast to southwest. Artifacts observed within Locus 4 include 11 petrified wood flakes (four primary, two secondary, and five shatter).

Locus 5 is located 12 meters east of Locus 4 and measures two meters northeast to southwest by two meters northwest to southeast. Artifacts observed within Locus 5 include six chert flakes (one primary, three secondary, and two shatter) and one multidirectional core.

In addition, there are three quartz secondary flakes, two metavolcanic secondary flakes, one piece of angular waste/shatter, and two metavolcanic hammerstones located outside the loci and within 30 meters. The further characteristics of the artifacts within SM-003 are unreported.

The more particular physical context for SM-003, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be a younger inset fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009: CUL-8). Despite geologically based claims for Early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007) therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont. Areas of active erosion within the fan piedmont, such as where this site is located, do have a slightly greater potential for the presence of subsurface deposits where recent alluvium has been deposited. Given the highly erosive nature of the fan piedmont it seems unlikely that such subsurface deposits would have been preserved. Furthermore, if subsurface cultural deposits were to be preserved under such isolated inset pediments, they will most likely be similar in quality and quantity of artifacts to those sites found on the surface in nearby remnant portions of the fan piedmont (URS 2009: CUL-8).

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature; debitage consists primarily of primary and tertiary flakes, angular waste/shatter, multi-directional and bi-directional cores and hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this site are of the same primary metavolcanic stone material (metavolcanic, quartz, petrified wood, cryptocrystalline silciate chert), and exhibit expedient lithic reduction methods of percussion reduction processes, it appears to represent five single reduction localities or episodes. It should not be discounted that artifacts within this locality may have been collected and/or used at another point in time after created.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. SM-003 is situated atop a subordinate landform characterized as a younger inset fan surface within the fan piedmont. This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area there is very low likelihood for subsurface archaeological deposits. Areas of active erosion within the fan piedmont, such as where this site is located, do have a slightly greater potential for the presence of subsurface archaeological deposits where recent alluvium has been deposited. Given the highly erosive nature of the fan piedmont, it seems unlikely that such subsurface deposits would have been preserved. Furthermore, if subsurface cultural deposits were to be preserved under such isolated inset pediments, they will most likely be similar in quality and quantity of artifacts to those sites found on the surface in nearby remnant portions of the fan piedmont (URS 2009: CUL-8). Therefore, data potential is considered exhausted through recordation of SM-003.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, SM-003 is not considered a contributor to an existing and/or proposed archaeological district or landscape

T-17

T-17 is a linear prehistoric trail that covers a total length of 159 meters. The site is located within the southwestern portion of the 300 MW area of the Proposed IVS Project. The trail is situated atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of a very old fan surface with intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site includes creosote, saltbush and ocotillo. The slope of the site is less than one degree.

T-17 is a prehistoric trail recorded in one segment, trending in an east to west direction. This trail segment measures 159 meters long, 50 to 60 centimeters wide at both the top and bottom, and less than five centimeters deep. The trail was cleared through the cast-off of larger cobbles to either side, leaving only small gravels and sand within the trail. The overall condition of the trail is poor, with evidence of off-road vehicle use in and around the trail.

The trail is situated atop moderately stabilized intact desert pavement and crossing over a fan piedmont geomorphic landform consisting of erosional fan remnants, sideslopes, gullies, and inset fans. The trail was cleared through the cast-off of larger cobbles to either side, leaving only small gravels and sand within the trail. The trail is situated atop moderately stabilized intact desert pavement. A single resource interpreted to be a lithic reduction site (DRK-041) is located approximately 65 meters east of the eastern terminus of the trail T-17. Additionally, the western terminus of trail T-41 lies approximately 100 meters north of the eastern end of T-17, and it is possible that they may have connected at one time, but if so, the connection point is no longer visible.

Trails such as T-17 may be surviving segments of a larger network of trails that once existed in the region. Trails were important to prehistoric people in that they helped fulfill an inherited human need for physical and spiritual security by providing safer and more reliable connections between territories and resource patches, and served the "socio-economic needs of settlement and exploitation patterns, migration, visitation, trade, war, quarrying, and making possible the location of central ceremonial areas" (von Werlhof 1988:52).

Trail T-17 does possess some characteristics that would support the interpretation of it as a prehistoric trail. The trail is evidenced as a narrow (approximately 40 centimeters) strip of land where larger stones are conspicuously absent from the desert pavement. Along the two sides of the trail are relatively higher concentrations of larger stones, supporting the interpretation that travelers would clear larger stones from the path, tossing them to the side. That practice of clearing stones would have made foot travel easier by removing obstructions. Additionally, the resulting trail would have a higher proportion of siliceous desert surface, which would reflect more moonlight, making night travel safer (von Werlhof 1988). Furthermore, the site DRK-041, interpreted to be a lithic reduction site, lies near the trail’s eastern extent and may be associated with it if the trail once extended further east. If that was the case, trail T-17 may have been used for travel to or through resource procurement areas.

Trails can be important and relatively rare resources that can help facilitate interpretation of prehistory and prehistoric lifeways. Trails such as T-17 are rare because the evidence of them is often so faint and ephemeral that it is most often erased by natural erosion, soils development, mechanical disturbance, and bioturbation. Additionally, trails often follow the most efficient travel route through an area. Over time, subsequent travel routes such as horse trails, ox cart roads, and eventually modern roads and highways are constructed to follow the same route and thereby overlay the prehistoric trail such that its existence is only known through oral history. It is in arid, relatively unpopulated places such as the project area, that can still be recognized as the remnants of ancient pathways (Davis 1974). Because trails were used to connect resource areas, territories, habitations, and ceremonial sites, they can be important sources of information to recover the locations of unknown archaeological resources and possibly traditional cultural properties.

However, the overall condition of the trail segment is poor, with disturbance caused by multiple parallel and perpendicular off highway vehicle tracks present in and around the trail, such that the trail's integrity is compromised. As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register, or a historical resource per the California Register under any of the criteria for eligibility. In addition, T-17 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

T-42

Site T-42 is a linear alignment of ground that appears to have been cleared of larger stones and cobbles, which is interpreted to be a prehistoric trail. The site covers a total length of 839 meters, and is located within the southeastern portion of the 300 MW area of the Proposed IVS Project. T-42 is situated within the fan piedmont remnant geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of disturbed desert pavement with portions traversing ephemeral gullies such that have been washed out such that any observable evidence of the trail has been erased, thereby dividing the trail into three segments. The desert pavement is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote, salt bush, and burroweed.

T-42 is a prehistoric trail recorded in three separate segments (Segments A, B and C), all of which trend in a northeast to southwest direction. Segment A is approximately 114 meters in length, Segment B is approximately 108 meters in length, and Segment C is approximately 617 meters in length. All segments are 40 to 50 centimeters wide and the combined length measures approximately 839 meters. The surface of the trail appears to be tamped, with observable evidence indicating that its surface has been cleared by casting-off larger cobbles to either side of the trail. The overall condition of the trail ranges from good to fair with evidence of recent off-highway vehicle (OHV) disturbance in Segment A, as well as natural disturbances caused by erosion. The southwest-western portion of Segment C is truncated by an ephemeral drainage, and other ephemeral drainages divide the site into its three segments.

There are no artifacts associated with the trail. However, the trail does run close to DRK-009 and SM-001 and therefore may be associated. DRK-009 is a dense lithic concentration with a natural crystal manuport and site SM-001 is a chert lithic scatter. Additionally, the western terminus of trail T-42 lies approximately 100 meters north of the eastern end of T-17, and it is possible that they may have connected at one time, but if so, the connection point is no longer visible. Furthermore, if T-42 once extended further in its apparent direction of travel to the northeast, it would traverse near, to approximately parallel with, a cluster of seven sites located 2.4 kilometers from its northeastern terminus. That cluster includes sites JF-007, JF-006, RAN-026, RAN-027, RAN-022, RAN-021, and RAN-023.

Trails such as T-42 are likely to be surviving segments of a larger network of trails that once existed in the region. Trails were important to prehistoric people in that they helped fulfill an inherent human need for physical and spiritual security, by providing safer and more reliable connections between territories and resources, and served the "socioeconomic needs of settlement and exploitation patterns, migration, visitation, trade, war, quarrying, and making possible the location of central ceremonial areas" (von Werlhof 1988:52).

Trail T-42 and the immediate area around it have characteristics that may speak to the importance of trails to prehistoric people. The trail is evidenced as a narrow (approximately 40 to 50 centimeters) strip of land where larger stones are conspicuously absent from the desert pavement. Along the two sides of the trail are relatively higher concentrations of larger stones, supporting the interpretation that travelers would clear larger stones from the path and toss them to either side. That practice of clearing stones would have made foot travel easier by removing obstructions. Additionally, the resulting trail would have a higher proportion of siliceous desert surface, which would reflect more moonlight, making night travel safer (von Werlhof 1988). Additionally, two lithic reduction sites are in close proximity to the trail and are in apparent alignment with it, giving evidence to the possible use of the trail to facilitate resource procurement.

Prehistoric trails are important and relatively rare resources that can help facilitate interpretation of prehistory and prehistoric lifeways. Trails such as T-42 are rare because the evidence of them is often so faint and ephemeral, that it is most often erased by natural erosion, soils development, mechanical disturbance, and bioturbation. Trails often follow the most efficient travel route through an area. Over time, subsequent travel routes such as horse trails, ox cart roads, and eventually modern roads and highways are constructed to follow the same route and thereby overlay the prehistoric trail such that its existence is only known through oral history. It is in arid, relatively unpopulated places such as the project area that can still be recognized as remnants of ancient pathways (Davis 1974). Because trails were used to connect resource areas, territories, habitations, and ceremonial sites, they can be important sources of information to recover the locations of unknown archaeological resources and possibly traditional cultural properties.

As a result, this site, as a stand-alone or individual resource, T-42 is recommended eligible for the National Register and is a historic property pursuant to the National Register and a historical resource per the California Register under the criteria for eligibility. In addition, T-42 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

DRK-023

DRK-023 is an amorphous-shaped archaeological deposit that includes both prehistoric and historic components and covers a total surface area of 262 square meters. The site is located within the western portion of the 450 MW area of the Proposed IVS Project. The site is situated atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of disturbed desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote, ocotillo, burroweed, bunch grass and desert trumpet.

This lithic scatter and rock cluster site measures 48 meters east to west by seven meters north to south, and contains a total of 61 prehistoric artifacts and two historic (modern) features. The prehistoric component consists of two concentrations interpreted to be one lithic scatter and one single reduction loci, with 61 artifacts. The historic component consists of two concentrations interpreted to be two potentially modern rock cluster (cairn) features and no additional artifacts were observed outside the loci and features. The areas between loci and features are void of artifacts. The prevailing cultural constituents within this site consist of prehistoric artifacts and two potentially modern rock cluster features. Artifact density at DRK-023 is low, with a calculated distribution of one artifact per 4.3 square meters. The overall condition of the site is fair due to off highway vehicle tracks which criss-cross the site and seem to run adjacent to the rock cairns.

The site contains two lithic reduction loci, two rock cluster (cairn) features and a total of 61 artifacts, which include: 31 green metavolcanic flakes (10 primary, 19 secondary and two tertiary), 23 quartz flakes (three primary, 17 secondary, one tertiary and two shatter), four petrified wood flakes (one primary and three secondary), two green metavolcanic multi-directional cores, and one quartz core. The areas between the loci and features are void of any cultural materials.

Feature 1 is located at the northeast end of the site and measures 19 inches north to south by 18 inches east to west by 11 inches tall. Feature 1 consists of approximately 15 granite and metavolcanic cobbles and raised three courses high. No artifacts are associated with this feature.

Feature 2 is located approximately 50 meters southwest of Feature 1 and measures 25 inches north to south by 34 inches east to west by four inches tall. Feature 2 consists of approximately 20 granite, metavolcanic and basalt cobbles. The feature is in poor condition, with the rocks it is constructed of, being lightly scattered and rising one course high. No artifacts are associated with this feature.

Locus 1 is located at the northeast end of the site and measures three meters east to west by two meters north to south. Artifacts observed within Locus 1 include: 31 green metavolcanic flakes (10 primary, 19 secondary and two tertiary), two green metavolcanic multi-directional core fragments, 15 quartz flakes (two primary, 12 secondary and one tertiary), one quartz core fragment, and four petrified wood flakes (one primary and three secondary).

Locus 2 is located 29 meters southwest of Locus 1 and measures two meters east to west by one meter north to south. Artifacts observed within Locus 2 include eight quartz flakes (one primary, five secondary and two shatter). There are no artifacts observed within 30 meters and outside the loci and features. The further character of artifacts found with DRK-023 is unreported.

The more particular physical context for DRK-023, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007) therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists primarily of primary, secondary and tertiary flakes, multidirectional cores, and angular waste/shatter. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this archaeological deposit are of two primary stone materials (metavolcanic and quartz) that are constituents of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least two reduction localities or episodes, but it should not be discounted that artifacts within these localities may have been collected and/or used at a later point in time.

Furthermore, archaeologists for the applicant interpret that even though the rock clusters present at DRK-023 have some characteristics similar to survey markers in the area, they cannot be conclusively identified as such. The size of the cluster and of the stones that comprise it conforms approximately to those surrounding General Land Office survey bench markers found in the surrounding region however the feature is not located on a current section or quarter section corner point.

Additionally, expediently constructed stone clusters can also be markers of mining claims or homestead boundaries. Mining claim markers sometimes contain tobacco tins to hold copies of official records substantiating the claim. Such a tin was not evident at this stone cluster.

The two rock cluster features present at DRK-023 have no clearly associated artifacts or any characteristics from which their antiquity might be determined. In addition, their apparent alignment with modern off-highway vehicle tracks would seem to support their being modern in age.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. DRK-023 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area there is very low likelihood for subsurface archaeological deposits, therefore data potential is considered exhausted through recordation of DRK-023.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, DRK-023 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

DRK-027

DRK-027 is an amorphous-shaped prehistoric site that covers a total surface of 1,614 square meters. The site is located within the western portion of the 450 MW area of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site includes creosote, ocotillo, and bunch grass.

This lithic scatter, groundstone tool and rock cluster feature site measures 171 meters north to south by 54 meters east to west, and contains a total of 310 prehistoric artifacts. It consists of seven concentrations interpreted to be six single reduction loci and one lithic scatter with 282 artifacts, and 28 additional artifacts observed outside the loci. The prevailing cultural constituents within this site consist of prehistoric artifacts and one rock cluster feature. Artifact density at DRK-027 is low, with a calculated distribution of one artifact per 5.21 square meters. The overall condition of the site is good.

The artifact types and materials present include 272 metavolcanic flakes (109 primary, 97 secondary, 61 tertiary and five angular waste/shatter), six metavolcanic cores (one uni-directional, one bi-directional and four multi-directional), one metavolcanic edge modified flake, two quartz flakes (one primary and one tertiary), one quartz multi-directional core, one quartzite secondary flake, four quartzite hammerstones, five basalt flakes (four secondary and one tertiary), two cryptocrystalline silicate chert flakes (one primary and one secondary), one cryptocrystalline silicate multi-directional core, eight petrified wood primary flakes, two granite hammerstones, one granite mano, and two granitic hammerstones, one granitic biface, and one metavolcanic tested cobble.

Feature 1 is located at the center of the site within Locus 1 and measures 4.3 meters north to south by 4.6 meters east to west. Feature 1 is constructed of approximately 100 large to small sub-rounded to sub-angular cobbles of various source materials (metavolcanic, quartz and quartzite).

Locus 1 is located at the center of the site and measures 11 meters north to south by 10 meters east to west. Artifacts observed within Locus 1 include: 41 metavolcanic flakes (30 primary and 11 secondary), two metavolcanic multi-directional cores, one metavolcanic edge modified flake, one quartz primary flake, one quartz multi-directional core, four quartzite hammerstones, one cryptocrystalline silicate chert secondary flake, and eight petrified wood primary flakes. Feature 1 is also located within Locus 1.

Locus 2 is located 37 meters north of Locus 1 and measures 15 meters north to south by seven meters east to west. Artifacts observed within Locus 2 includes: 45 metavolcanic flakes (28 primary, 11 secondary and six tertiary), one metavolcanic multi-directional core, one cryptocrystalline silicate chert primary flake, and one brown cryptocrystalline silicate chert multi-directional core.

Locus 3 is located 38 meters north of Locus 2 and measures two meters north to south by three meters east to west. Artifacts observed within Locus 3 include: 115 metavolcanic flakes (32 primary, 42 secondary and 41 tertiary), one metavolcanic multi-directional core and one granitic hammerstone.

Locus 4 is located 95 meters south of Locus 3 and measures three meters east to west by one meter north to south. Artifacts observed within Locus 4 include 11 metavolcanic flakes (three primary, seven secondary and one tertiary).

Locus 5 is located 40 meters southwest of Locus 4 and measures two meters north to south by one meter east to west. Artifacts observed within Locus 5 include 10 metavolcanic flakes (four primary, five secondary, one shatter).

Locus 6 is located 164 meters north of Locus 5 and measures one meter north to south by one meters east to west. Artifacts observed within Locus 6 include: 20 metavolcanic flakes (three primary, eight secondary, eight tertiary and one shatter), one granite hammerstone and one metavolcanic tested cobble.

Locus 7 is located 20 meters south of Locus 6 and measures one meter north to south by one meter east to west. Artifacts observed within Locus 7 include 14 metavolcanic flakes (four primary, three secondary, five tertiary and two shatter) and one metavolcanic bi-directional core.

Those artifacts observed within 30 meters and outside of the loci consist of 16 metavolcanic flakes (five primary, 10 secondary and one shatter), one metavolcanic uni-directional core, one quartzite secondary flake, five basalt flakes (four secondary and one tertiary), one granitic biface, one granitic mano, one granitic hammerstone, one granitic hammerstone, and one quartz tertiary flake. The further character of artifacts found within DRK-027 is unreported.

The more particular physical context for DRK-027, extrapolating information from Data Response 112 Figure 4 (URS 2009), to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007), therefore there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence

in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature; debitage consists primarily of primary flakes and multi-directional cores, angular waste/shatter, and hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone material (metavolcanic) that is a constituent of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least seven single reduction localities or episodes, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

A single groundstone tool, a mano, was found at DRK-027. Ground stone tools found in the area surrounding DRK-027 include manos, metates (sometimes referred to as milling stones) and pestles. Metates in this area are typically flattish slabs, manos were smaller, soap and loaf-shaped stones that were moved in a circular motion against the metate, in order to grind small seeds and other food resources; pestles were elongated, club-shaped stones used for pounding and grinding in a mortar. Manos, metates, and pestles were primarily constructed from coarse-grained stone such as sandstone or granite. Mortars in desert environments absent of large coarse bedrock outcrops were made from cottonwood. Manos, metates, and pestles are associated with subsistence procurement and/or processing (Chartkoff and Chartkoff 1984). The single granitic mano observed is bifacially ground with pecking noted.

The presence of flaked stone tools such as the granitic biface and metavolcanic edge-modified flake (EMF) within DRK-027 represents further evidence of resource procurement and/or processing of faunal or floral resources. The creation of flaked stone tools requires additional lithic technologies, possibly including bifacial thinning and pressure flaking to shape and refine cutting edges. The EMF is green metavolcanic material and unifacial retouch. The surface of the granitic biface is so eroded, the tool is nearly unrecognizable. Additionally, the biface was not found in spatial association with the edge modified flake, so it is unlikely that they were used within the same time frame.

Though the single rock cluster feature found at DRK-027 does not have any temporally diagnostic characteristics, evidence seems to support the hypothesis that it is prehistoric in age. It is spatially associated with lithic debitage and is made up of predominantly the same stone material (metavolcanic) that also predominates in the overall artifact assemblage at DRK-027. Therefore, it seems likely that this rock cluster feature is a location where lithic raw material was collected in order to increase the efficiency of stone tool manufacture at DRK-027.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. DRK-027 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits, therefore data potential is considered exhausted through recordation of DRK-027.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, DRK-027 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

DRK-029

DRK-029 is an oblong-shaped lithic scatter site that covers a total surface of 27.93 square meters. The site is located within the western portion of the 450 MW area of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of intact desert pavement that is moderately developed with small to large sub-rounded gravels and small to medium-sized sub-rounded cobbles comprised of metavolcanic, basalt, quartz, quartzite, and granitic rocks. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote, ocotillo, and desert trumpet.

This lithic scatter site measures 16 meters northeast to southwest by three meters northwest to southeast, and contains a total of 10 prehistoric artifacts. It consists of one concentration interpreted to be a single lithic reduction locus, with nine artifacts, and one additional artifact observed outside the locus. The prevailing cultural constituents within this site consist of prehistoric lithic reduction artifacts. Artifact density at DRK-029 is low, with a calculated distribution of one artifact per 2.79 square meters. The overall condition of the site is fair due to off-road vehicle tracks that occur near the site.

The site contains one single lithic reduction locus and a total of 10 artifacts (nine associated with the locus), which include: seven metavolcanic flakes (six primary and one secondary), one basalt hammerstone, one metavolcanic multi-directional core, and one quartz tested cobble.

Locus 1 is located in the southwestern end of the site and contains the site datum (which is the metavolcanic core). It measures three meters east to west by two meters north to south. Artifacts observed within Locus 1 include: seven green metavolcanic flakes (six primary and one secondary), one basalt hammerstone, and one green metavolcanic multidirectional core.

The artifact observed outside and northeast of the locus consists of one quartz tested cobble. The further character of artifacts associated with DRK-029 is unreported.

The more particular physical context for DRK-029, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont geomorphic landform. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007) therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists predominantly of primary flakes and one multi-directional core, with one hammerstone. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone (metavolcanic) material that is a constituent of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent one single reduction locality or episode, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

This site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area there is very low likelihood for subsurface archaeological deposits, therefore data potential is considered exhausted through recordation of DRK-029.

As a result, DRK-029 is recommended not eligible for the National Register and is not a historical resource pursuant to National Register and California Register under any of the criteria for eligibility. In addition, DRK-029 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

DRK-032

DRK-032 is an oval-shaped lithic scatter that covers a total surface area of 135 square meters. The site is located within the south-central portion of the 450 MW area of the Proposed IVS Project. The site is situated atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The site is situated atop moderately to well-developed intact desert pavement with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. A small amount of the site surface area is disturbed by off highway vehicle activity and sheetwash erosion such that no desert pavement remains. Soils contain alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote, ocotillo, burroweed and desert trumpet.

This lithic scatter site measures 23 meters northwest to southeast by eight meters northeast to southwest, and contains a total of 111 prehistoric artifacts. It consists of two concentrations interpreted to be two single reduction loci, with 109 artifacts and one additional artifact observed outside the loci. The prevailing cultural constituents within this site consist of prehistoric lithic reduction artifacts. Artifact density at DRK-032 is low, with a calculated distribution of one artifact per 1.2 square meters. The overall condition of the site is good, with some alterations due to off-highway vehicle activity and sheetwash erosion.

The site has a total of 110 prehistoric artifacts occuring within the site boundary which include: 98 green metavolcanic flakes (33 primary flakes, 16 secondary flakes, 11 tertiary flakes and 38 shatter), five primary cryptocrystalline silicate brown chert flakes, one green metavolcanic multi-directional core, three green metavolcanic bi-directional cores, three basalt primary flakes, one basalt assayed cobble and one green metavolcanic hammerstone. Areas between the loci are void of artifacts with the exception of a single hammerstone which is located at the northwest boundary of the site.

Locus 1 is near the northern boundary of the site and measures five meters north to south by three meters east to west. Locus 1 contains a total of 105 prehistoric artifacts, which include: 98 green metavolcanic flakes (33 primary flakes, 16 secondary flakes, 11 tertiary flakes and 38 pieces of angular waste/shatter), five brown cryptocrystalline silicate primary flakes, one green metavolcanic multi-directional core, and one green metavolcanic bi-directional core.

Locus 2 is 16 meters south of Locus 1 and measures two meters north to south five meters east to west. Locus 2 contains a total of four prehistoric artifacts which include one basalt assayed cobble and three basalt primary flakes, which refit to the assayed cobble.

A single green metavolcanic hammerstone is located outside the observed loci. The further character of artifacts found within DRK-032 is unreported.

The more particular physical context for DRK-032, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont with heavy stage IV/V calcic horizon underlying the surface. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature; debitage consists mainly of primary flakes, secondary flakes, tertiary flakes, angular waste/shatter, cores, a hammerstone, and an assayed cobble. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone material (green metavolcanic) that is a constituent of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least two single reduction localities or episodes, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. DRK-032 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area there is very low likelihood for subsurface archaeological deposits; therefore, data potential is considered exhausted through recordation of DRK-032.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, DRK-032 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

EBR-019

EBR-019 is an amorphous/oblong-shaped prehistoric site that covers a total surface of 786,087 square meters. The majority of the site occurs outside of the Proposed IVS Project, in the exclusion area that is not proposed for development. Those portions that occur within the Project area are located in the 100 foot buffer of the proposed Water Line to the north and the 450 MW area of the Proposed IVS Project to the south. The site appears to be within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation (URS 2009). The surface consists of finer grained material eroded from the fan piedmont that has formed a number of fan “aprons”, which do not individually fully cover the entire area, and which interfinger and partially bury one another and piedmont remnants. Large portions of the site located inside the Project area are situated within fan piedmont remnants frequently cut through by gullies and active washes with intact desert pavement that is poorly to moderately developed, consisting of small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. An active wash transects the site east to west, through the north central portion of the site and numerous smaller ephemeral washes and gullies are evident as well. Soils of moderately to well-sorted finer grained clasts contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. The northwest and northeastern portions of the site within the Project area, as well as portions that extend into the exclusion area, are located within or adjacent to the sub-landform interface between the lake basin, fan apron and beach zone. Observed profiles within the lake basin areas indicate that the soils are made up of thick deposits of gray fine sand and silt that may be a combination of Colorado River supplied lake sediments, as well as fines flushed into the lake by stream/wash that once terminated nearby at the shoreline. The soils within the beach zone consist of sands that are non-cohesive and vary from coarse sub-angular to sub-rounded sand, small gravels to medium and coarse well rounded sands overlaid by fine silts and clays. Vegetation species on the site include ocotillo, desert trumpet, bunch grasses, creosote and saltbush.

This prehistoric site measures 1,685 meters southeast to northwest by 1,579 meters southwest to northeast, and contains approximately 14,413 prehistoric artifacts. It consists of concentrations interpreted as follows: 87 lithic scatters, two ceramic scatters, 32 lithic and ceramic scatters, one lithic, ceramic, and groundstone scatter, four cremations with associated lithic and ceramics, 54 fire-affected rock/hearth features and one cremation feature. The prevailing cultural constituents within this site consist of prehistoric artifacts and fire affected rocks/hearth features. Artifact density at EBR-019 is low, with an approximate calculated distribution of one artifact per 0.05 square meters. The overall condition of the site is good to fair. Additionally, natural erosion and deposition is also taking place in washes and drainages within the site which have evidence of seasonal flooding.

The site contains an approximate total of 126 loci (14 of which occur within the Project area and nine of which contain possible cremations), 53 features (52 fire affected rock/hearth features and one cremation feature) and approximately 14,413 artifacts. Prehistoric artifact types represented at EBR-019 consist of: 8,676 ceramic sherds (including both Colorado buffware and Tizon brownware), 4,969 pieces of lithic debitage, 378 cores, 304 lithic tools (which include core-tools, hammerstones, bifaces, edge modified flakes, and preforms), 27 groundstone artifacts (which include manos and metates), 50 fire affected rocks, nine Olivella shell beads and 15 projectile points (7 Cottonwood Series projectile points, 4 Desert Side-notched Series projectile points and 4 indeterminate projectile points). An approximate total of 231 calcined human bone fragments and 42 animal and unidentified bone fragments were also observed within the site and are located in features F3, F18 and loci L50 through L52, L55, L57, L58, L61, L62 and L65. The predominate lithic reduction stone identified at EBR-019 include metavolcanic, basalt, petrified wood, quartzite, quartz, cryptocrystalline silicate (chert, jasper and chalcedony), and wonderstone rocks. Further detail of artifact material types and characteristics can be found within the loci and feature descriptions.

There are a total of 52 features identified; 51 are comprised primarily of fire-affected rocks/hearths and one is a cremation feature. Features 2, 15 through 20, 24, 55 and 56 are found with the Area of Potential Effect (APE); Features 1, 3 through 13, and 25 through 53 are located outside the Project area. Feature 15 was not relocated during re-survey by URS, September 2009, which archaeologist interpreted to be a result of recent sheet wash within the site, which appeared to have been redeposited and/or buried artifacts and/or features within active washes. In the process of data collection the following feature numbers were inadvertently skipped: 14, 21 through 23, 48 and 54. All features are described below:

Feature 1 is situated on the northwest portion of the site and located out of the APE. It consists of a deflated hearth with, at minimum, 25 fragments of fire affected rock, primarily black metavolcanic material. The feature is oriented southeast to northwest in a linear alignment.

Feature 2 is situated on the southwestern portion of Locus 8. The feature is located within the APE and is approximately 24 meters south-southwest from locus center sub-datum. The feature is approximately 26 meters west of Feature 1 and approximately 15 meters southwest from Feature 16. Feature 2 measures one meter east to west by one meter north to south. The feature is a hearth remnant comprised of six small cobble-sized fire-affected metavolcanic and sandstone rocks arranged in a semi-circular ring. The feature is firmly imbedded and situated on a south-facing slope toe of a deflating rise, adjacent to a creosote hummock. The artifacts associated with the feature include: five porphyritic metavolcanic flakes located within a one meter proximity to the hearth. There is no visible staining or charcoal on surface, however subsurface potential is good.

Feature 3 is located out of the APE and is approximately 462 meters southeast of Feature 2. It measures approximately five by five meters. The artifacts observed within this feature consist of at least three fragments of undetermined calcined bone, two spire-ground beads, Olivella shell beads and a dense scatter of 100 ceramic sherds, mostly brownware. The ceramic sherds represent a variety of vessel forms including dry storage vessels, cooking vessels, a large open mouth bowl and a small open mouth bowl.

Feature 4 is located out of the APE and is approximately 66 meters northeast of Feature 3. It consists of a deflated hearth measuring five meters by three meters and 15 or more fragments of metavolcanic and sandstone fire-affected rock.

Feature 5 is located out of the APE and is approximately 35 meters southwest of Feature 5. It consists of a deflated hearth measuring six meters by six meters. This feature is comprised of 20 or more fragments of sandstone and metavolcanic fire affected rock. The feature appears to be eroding from a hummock with a creosote bush. This feature has potential for buried deposits.

Feature 6 is located out of the APE and is approximately nine meters south southwest of Feature 5. It consists of a deflated hearth measuring six meters by seven meters and consists of 12 or more fragments of metavolcanic and sandstone fire affected rock. The feature is located at a high point on a low hummock. The feature has potential for buried deposits within the hummock.

Feature 7 is located out of the APE and is approximately 93 meters north northeast of Feature 6. It consists of a deflated hearth measuring four meters by four meters and consists of 10 or more fragments of granitic, sandstone and metavolcanic fire affected rock. This feature is located on top of a small hummock. The feature has potential for buried deposits in the hummock.

Feature 8 is located out of the APE and is approximately 373 meters southwest of Feature 7. It consists of a deflated hearth measuring two meters by two meters and is comprised of eight or more primarily metavolcanic fragments. Eight to ten Tizon brownware ceramic vessel body sherds were observed in this location.

Feature 9 is located out of the APE and is approximately 93 meters east of Feature 8. It consists of a deflated hearth measuring five meters by three meters and is comprised of 30 or more fragments of metavolcanic, granitic, quartzite and sandstone fire affected rock.

Feature 10 is located out of the APE and is approximately 60 meters east southeast of Feature 9. It consists of a deflated hearth measuring four meters by four meters and is comprised of 15 or more fragments of metavolcanic, sandstone and granitic fire affect rock.

Feature 11 is located out of the APE and is approximately 833 meters southeast of Feature 10. It consists of a deflated hearth measuring three meters by one meter and consists of 15 metavolcanic, sandstone and quartz cobbles. All the cobbles show evidence of fire altering.

Feature 12 is situated within Locus 13. The feature is located out of the APE and is approximately 49 meters west southwest of Feature 11. It consists of a deflated hearth measuring 75 centimeters by 40 centimeters with five fragments of metavolcanic and sandstone fire affected rock.

Feature 13 is situated within Locus 13. The feature is located out of the APE and is approximately 19 meters southeast of Feature 12. It consists of a deflated hearth measuring two meters by two meters with five or more metavolcanic fire affected cobbles. One of the cobbles appears to be battered (possible hammerstone).

Feature 16 is situated within Locus 8. The feature is located within the APE and is approximately 16 meters northeast of Feature 13 and approximately 15 meters northeast of Feature 2. Feature 16 measures four meters east to west by one meter north to south. It is described as a deflated hearth but a general scatter of fire-affected rock would be more accurate. Feature 16 consists of two sandstone, one granitic and five metavolcanic very small to small cobble-sized rocks. Seventeen ceramic body vessel sherds (10 brownware and seven buffware); three porphyritic metavolcanic flakes and one quartzite decortical flake are located within feature boundary. Two cores and several ceramic rim sherds are located within a one meter proximity to the feature. All above mentioned artifacts were included in Locus 8 Description. Integrity of the feature is poor. Krotovina disturbance is prevalent, but subsurface potential is good.

Feature 17 is situated on the northwestern portion of Locus 67. The feature is located within the APE and is approximately 100 meters west northwest of Feature 16. It measures approximately eight meters north to south by seven meters east to west. Feature 17 is described as deflated hearth scatter consisting of 20 or more fragments (averaging eight to 15 centimeters diameter in size) of fire-affected sandstone and two metavolcanic small cobbles. A quartzite battered cobble, 20 or more porphyritic metavolcanic flakes and several cryptocrystalline silicate (mostly thinning) flakes are located within one meter around the feature boundary. These artifacts were not included in Locus 67 sample inventory but types and reduction stages are consistent with locus constituents, and also those of Feature 20. Condition of the feature is fair and subsurface potential is moderate due to eroding pavement impacted by siltation.

Feature 18 is located within the APE and is approximately 78 meters south of Feature 19. The feature is composed of the remains of a human cremation and measures 18 meters by 10 meters. Artifacts observed in this location include: 30 brownware ceramic vessel fragments, 15 green metavolcanic flakes and one quartzite multi-platform core. Faunal bones observed include: one small to medium carnivore artial dentary fragment, sheep/goat innominate fragments including portions of ilium, ischium, and pubis at the acetabulum. Human bones observed include: one calcined portion of the occipital bone with arterial sulcus, one calcined fragment of an ulna mid-shaft fragment and several (10) small calcined cranial fragments.

Feature 19 is located situated on the northeastern portion of Locus 67. The feature is located within the APE and is approximately 99 meters northeast of Feature 18. It measures five meters north to south by three meters east to west. The feature is described as a deflated hearth comprised of 12 or more fire-affected sandstone, quartz, metavolcanic and granitic rocks, all small cobble-sized. Five porphyritic metavolcanic flakes (mostly interior reduction stage), one basalt secondary flake and one brownware direct, reinforced rim sherd were observed within and one meter around the feature boundary. Condition of the feature is fair as it is situated atop a high point of the landform.

Feature 20 is situated on the northeastern portion of Locus 67. The feature is within the APE and approximately 33 meters east northeast from Feature 19. It measures 11 meters east to west by five meters north to south. The feature consists of two distinct concentrations of fire-affected rock and disarticulated fire-affected rock scattered proximal to those concentrations. The easternmost concentration measures three meters east to west by three meters north to south. It is comprised of 70 or more fire-affected fist-sized cobbles and medium-large gravel-sized spalls (50 or more metavolcanic, nine or more granitic and 11 or more sandstone). The largest rocks are arranged in a circular pattern, approximately two meters in diameter. A total of 20 artifacts were observed within this concentration, and include: nine white chalcedony flakes (three primary, five secondary and one tertiary); one white chalcedony edge modified flake, one porphyritic metavolcanic secondary flake, one porphyritic metavolcanic angular shatter piece, three cryptocrystalline silicate flakes (one primary and two secondary) and five buffware body vessel sherds. The westernmost concentration measures approximately four meters north to south by three meters east to west. A total of 69 or more fist-sized to medium-large, gravel-sized, fire-affected rocks comprise this concentration, and include: 36 or more metavolcanic, 28 or more sandstone, three quartz cobbles and two or more granitic cobbles. Two artifacts were observed within this concentration and include one quartz decortical flake and one decortical basalt flake. All above mentioned artifacts for Feature 20 were included in the artifact inventory for Locus 67 description. Overall condition of Feature 20 is fair. The feature occurs on the east-facing slope of the landform, which is subject to colluvial wash and eolian deflation. Most of the fire-affected rocks are disarticulated, somewhat scattered, and moderately imbedded, except for the easternmost concentration, which still preserves a circular arrangement. Based on the amount of fire-affected rock, the degree of thermal alteration, and the diameter of the circular arrangement in the eastern portion, it is likely that Feature 20 represents roasting activities and consists of two distinct pits. Subsurface potential is good because the easternmost concentration contains carbonized soil.

Feature 24 is located within the APE and on the western portion of Locus 68. The feature is approximately 993 meters northwest of Feature 45 and measures two meters east to west by at least two meters north to south. Recent sheetwash events have impacted the southern portion. Dark, carbonized soils are revealed in the soft road cut. Feature 24 contains 13 small cobbles of fire-affected sandstone, metavolcanics and granitics. Faintly, a semi-circular pattern can be discerned, but the majority of fire-affected rocks are disarticulated. The 50 or more ceramic sherds and 20 lithic debitage pieces that occur proximal to the feature are inventoried in Locus 68 description. Generally, the condition is poor because of the road cut and erosion. However, there is a definable subsurface component, based on the road cut.

Feature 25 is located out of the APE and is approximately 1,123 meters southeast of Feature 24. It consists of a deflated hearth, located to the west of Locus 39, and is situated in a drainage. The feature measures two meters north to south by two meters east to west. Fire-affected rock occurs in, and around, Locus 39, which appears to represent more than one hearth in this general area. East of Locus 39, more fire-affected rock is present but no discernable hearth could be identified. The feature contains 20 or more fire affected rock and two brownware sherds.

Feature 26 is located out of the APE and is approximately 143 meters northwest of Feature 25. It consists of a deflated hearth that measures two meters north to south by two meters east to west. The feature contains 30 or more dispersed metavolcanic, quartz and quartzite fire affected rocks. One Tizon brownware sherd is associated with the feature.

Feature 27 is located out of the APE and is approximately 64 meters southwest of Feature 26. It consists of a round, intact hearth that measures externally two meters north to south by two meters east to west, and internally one meter north to south by one meter east to west. The hearth contains quartz, quartzite and metavolcanic rocks and one green metavolcanic core. Other artifacts observed in and around the hearth include, at minimum, 10 green metavolcanic flakes.

Feature 28 is located out of the APE and is approximately 130 meters northeast of Feature 27. It consists of a cleared area situated atop desert pavement and measures six meters northeast to southwest by four meters northwest to southeast. Debitage is present in low quantities including less than five metavolcanic and cryptocrystalline flakes.

Feature 29 is located out of the APE and is approximately 59 meters south southeast of Feature 28. It consists of two cleared areas separated by one meter of intact desert pavement. The larger cleared area measures four meters east to west by three meters north to south and the smaller area measures two meters north to south by two meters east to west. Debitage is present in low quantities with less than 20 flakes observed (approximately 90% metavolcanic).

Feature 30 is located out of the APE and is approximately 15 meters northwest of Feature 29. It consists of a cleared area in a cobble field environment and measures four meters north to south by four meters east to west. Debitage is present in low quantities, with five metavolcanic flakes observed within the feature. The western edge is undefined as it transitions into a sandy wash.

Feature 31 is located out of the APE and is approximately 87 meters northwest of Feature 30. It consists of a hearth feature with a poorly defined shape and boundary and measures 0.2 meters north to south by 0.5 meters east to west. The feature contains approximately 10 small metavolcanic fire affected rocks.

Feature 32 is also located out of the APE and within Locus 57. This feature is 400 meters east southeast of Feature 31 and consists of a widely dispersed hearth that measures one meters north to south by one meter east to west. The feature contains approximately 20 sandstone, metavolcanic, quartz and quartzite fire-affected rocks.

Feature 33 is located out of the APE and is approximately 300 meters west northwest of Feature 32. It consists of a deflated hearth measuring one meter north to south by one meter east to west. The hearth contains 17 granite, basalt and cryptocrystalline silicate fire-affected rock.

Feature 34 is located out of the APE and is approximately 47 meters northeast of Feature 33. It consists of a deflated hearth that measures two meters north to south by two meters east to west. The feature contains 10 metavolcanic fire-affected rocks.

Feature 35 is situated on the southwest corner of Locus 52. The feature is located out of the APE and is approximately 58 meters southeast of Feature 34. It consists of a hearth that is situated within a small wash. The feature contains 15 metavolcanic and basalt fire-affected rocks.

Feature 36 is located out of the APE and is approximately 193 meters southwest of Feature 35. It consists of a hearth feature. The feature contains 35 basalt, metavolcanic and quartz fire-affected cobbles.

Feature 37 is located out of the APE and is approximately 295 meters north of Feature 36. It consists of a deflated hearth measuring one meter by one meter. The feature contains granite, quartz, cryptocrystalline silicate and a single green metavolcanic fire-affected rock.

Feature 38 is located out of the APE and is approximately two meters north of Feature 37. It consists of a deflated hearth situated in an ephemeral drainage measuring one meter north to south by one meter east to west. The feature contains 18 fire-affected rocks.

Feature 39 is situated within Locus 63. The feature is located out of the APE and is approximately 47 meters southeast of Feature 38. It consists of a lightly embedded (less than one centimeter) hearth that measures one meter north to south by two meters east to west. The feature contains 13 fist-sized or larger fire-affected rocks (two basalt, one granite and 10 metavolcanic) and one ceramic fragment.

Feature 40 is situated within Locus 57. The feature is located out of the APE and is approximately 294 meters southeast of Feature 39. It is interpreted as a fire-affected rock/hearth feature that measures one meter north to south by one meters east to west. The feature contains 30 predominately metavolcanic with some quartz and quartzite fire-affected rocks that are cracked and oxidized.

Feature 41 is located out of the APE and is approximately 12 meters north northwest of Feature 40. It consists of a rounded deflated hearth that measures two meters east to west by two meters north to south externally and one meter by one meter internally. This feature contains 55 basalt, granite and metavolcanic fire-affected rocks.

Feature 42 is situated within Locus 59. The feature is located out of the APE and is approximately 33 meters north northwest of Feature 41. It consists of a hearth feature that measures one meter north to south by one meter east to west. This feature contains 15 fist-sized and larger fire-affected rocks.

Feature 43 is located out of the APE and is approximately 63 meters north northwest of Locus 42. It consists of a dispersed hearth that measures two meters north to south by three meters east to west. The feature contains 30 fist-sized and larger metavolcanic, basalt and mudstone fire-affected rocks.

Feature 44 is situated within Locus 57. The feature is located out of the APE and is approximately 119 meters south southwest of Feature 43. It consists of a small cluster of fire affected rocks that measures one meter north to south by one meter east to west. The feature contains approximately 15 sandstone, metavolcanic and quartz fire-affected rocks.

Feature 45 is located out of the APE and is approximately 138 meters north northeast of Feature 44. It consists of a dispersed hearth that measures two meters north to south by one meter east to west. The feature contains 15 fist-sized metavolcanic and basalt fire-affected rocks.

Feature 46 is situated within Locus 61. The feature is located out of the APE and is approximately 316 meters northwest of Feature 45 and approximately 483 meters north northwest of Feature 53. It consists of an artifact and fire-affected rock scatter that measures one meter north to south by one meter east to west. The feature contains three metavolcanic cores, one sandstone mano and seven fire-affected rocks.

Feature 47 is situated within Locus 61. The feature is located out of the APE and is approximately 89 meters southwest of Feature 46. It consists of a dispersed hearth that measures approximately three meters north to south by two meters east to west. The feature contains 22 mostly metavolcanic fire-affected rocks.

Feature 49 is situated within Locus 64. The feature is located out of the APE and is approximately 225 meters southwest of Feature 47. It consists of a deflated hearth that measures one meter north to south by one meter east to west. The feature contains approximately 40 metavolcanic, quartz, granite and sandstone fire-affected rocks that are slightly embedded (one to three centimeters) and four Tizon brownware sherds.

Feature 50 is located out of the APE and is approximately 321 meters southeast of Feature 49. It consists of a somewhat deflated hearth feature and measures two meters east to west by one meter north to south. The feature contains approximately 20 metavolcanic, quartz and quartzite fire-affected cobbles.

Feature 51 is situated within Locus 64. The feature is located out of the APE and is approximately 189 meters east southeast of Feature 49. It consists of a deflated and disturbed hearth with embedded carbon. It measures one meter north to south by one meter east to west. The feature contains five metavolcanic and quartzite fire-affected rocks (some are completely embedded), and in situ firewood, ceramic and groundstone. The embedding, size and patination of the hearth constituents, as well as the associated artifacts, indicate prehistoric use. Although, nearby hearths appear to be modern or have been used during modern times.

Feature 52 is situated within Locus 64. The feature is located out of the APE and is approximately 156 meters west southwest of Feature 19 and approximately four meters north of Feature 52. It consists of a hearth with modern use but likely was constructed with stones from nearby hearths. The feature contains metavolcanic, quartz and sandstone fire-affected/oxidized rock, with a majority not embedded and modern wire. Carbon is present on the surface. There is a possibility of pot hunting and/or recent camping in the area. Artifacts observed in Feature 52 include 121 Colorado buffware and Colorado Tizon brownware body sherds and two Tizon brownware rim sherds, two metavolcanic cores, one cryptocrystalline core, one metavolcanic flake and one quartz hammerstone.

Feature 53 is situated within Locus 64. The feature is located out of the APE and is approximately 154 meters east of Feature 52. It consists of a deflated hearth composed of approximately 70 metavolcanic, quartz, granite and sandstone fire-affected rocks that are slightly embedded (one to three centimeters).

Feature 55 is within the APE, located approximately 812 meters northwest of Feature 46. It consists of a hearth measuring three meters north to south by two meters east to west. The hearth consists of a total of 38 medium to large-sized cobbles and fragments situated in an oblong shape with 18 vesicular basalt fragments, ranging in size from five to 22 centimeters in length and 20 cobbles of various materials (quartzite, granite, quartz, metavolcanic and one tabular piece of sandstone), ranging in size from eight to 19 centimeters. Artifacts observed in association with the feature include: four Colorado Tizon brownware sherds (three body and one rim), one green metavolcanic tertiary flake, one metavolcanic core fragment and one tested cobble.

Feature 56 is located within the APE and is approximately three meters south of Feature 55. It consists of a hearth measuring three meters southwest to northeast by one northwest to southeast and is approximately one meter from Locus 55. The hearth consists of 26 medium to large cobbles and fragments of vesicular basalt in roughly an "L" shape. Artifacts observed in association with the feature include two green metavolcanic tertiary flakes and four Colorado buffware sherds (one bowl rim and three body sherds).

The following three fire-affected rock/hearth features were found in Locus 64 (exclusion area) and therefore were not individually mapped. These three features are described as the following:

A disturbed and deflated hearth that measures two meters north to south by one meter east to west. The feature is comprised of approximately 18 sandstone, metavolcanic, quartz and granite rocks, some fire-affected and some embedded along with some carbon. This feature appears to have been disturbed by modern activities.

A deflated hearth that measures one meter north to south by one meter east to west. The feature contains 22 metavolcanic, quartz and rhyolite fire affected rocks. The stones are embedded approximately six centimeters. Below the surface the stones have a carbon coating. Artifacts observed include one unifacial limestone mano and one basalt core tool with battering on two edges.

A poorly embedded (less than two centimeters) deflated hearth that measures two meters north to south by two meters east to west. The feature is comprised of, at minimum, 20 metavolcanic, quartz, quartzite and basalt fire-affected rocks.

There are a total of 126 loci identified within EBR-019. The majority of loci are largely comprised of lithic and ceramic artifacts. Although, Loci 1, 2, 8, 18, 67 through 73 and 124 through 126 are found within the APE; Loci 3 through 7, 9 through 17, 19 through 66 and 74 through 123 are located out of the Project APE. These loci are described below:

Locus 1 is located within the APE and is in the northeastern portion of the site. It measures 67 meters north to south by 40 meters east to west. Artifacts observed within

Locus 1 include: 135 ceramic body sherds (128 buffware and seven Tizon brownware), five ceramic basal sherds (two buffware and three Tizon brownware), five ceramic rim sherds (one Tizon brownware slight recurved, rounded lip; one Tizon brownware direct, flattened lip; one buffware direct, rounded lip; one buffware slightly recurved, rounded lip with horizontal incising and one buffware with beveled lip for lid fitting or is a lid fragment), eight porphyritic metavolcanic flakes (six primary and two secondary), two porphyritic metavolcanic shatter, one brown chalcedony secondary flake and one quartzite hammerstone.

Locus 2 is located within the APE and is approximately 44 meters west of Locus 1. It measures 25 meters north to south by 25 meters east to west. Artifacts observed within Locus 2 include: 21 ceramic body sherds (15 red buffware and six Tizon brownware), two Tizon brownware basal sherds, four porphyritic metavolcanic flakes (two primary and two secondary), six ceramic rim sherds (four Tizon brownware direct, rounded lips; one Tizon brownware slightly recurved, rounded lip of small olla neck vessel and one red buffware slightly recurved, rounded lip), one porphyritic metavolcanic tested cobble and one basalt multi-directional core tool.

Locus 3 is located out of the APE and is approximately 75 meters south of Locus 2. It measures 20 meters north to south by 53 meters east to west. Artifacts observed include: 23 Tizon brownware ceramic body fragments, 24 Colorado buffware ceramic body fragments, one buffware rounded lip direct rim sherd, one Colorado buffware recurved rounded top rim sherd, four brownware ceramic direct rounded lip rim sherds, seven green metavolcanic flakes (three primary, three secondary and one shatter), two brown secondary metavolcanic flakes, one exhausted gray metavolcanic uni-directional core, one gray/brown chert multi-directional core, one green metavolcanic uni-directional core, one green metavolcanic hammerstone, one fragment of a green metavolcanic hammerstone, one light gray/white quartzite bi-directional and bifacial core and one heavily weathered white granitic unifacial mano.

Locus 4 is located out of the APE and is approximately 94 meters west of Locus 3. It measures 65 meters northeast to southwest by 45 meters northwest to southeast. Artifacts observed within Locus 4 include: 57 Tizon brownware ceramic body sherds, 50 Colorado buffware ceramic body sherds, 21 green metavolcanic flakes (six primary and 15 secondary), five fragments of fire altered sandstone, five gray-white quartzite flakes (three primary and two secondary), two brown metavolcanic flakes (one primary and one secondary), one white quartz primary flake, five gray chert flakes, one brown chert flake, one Colorado buffware direct rounded lip rim sherd, one Colorado buffware slight recurved rounded lip rim sherd, one cryptocrystalline biface fragment, one Tizon brownware direct rounded lip rim sherd, one Tizon brownware rounded slight lip curve rim sherd, one Tizon brownware direct rounded lip rim sherd with a drilled mend hole and one dark gray/brown cryptocrystalline core fragment.

Locus 5 is located out of the APE and is approximately 137.5 meters south-southwest of Locus 4. It measures 90 meters north to south by 130 meters east to west. An 80 to

90% sample of surface artifacts was recorded at this location. Artifacts observed within Locus 5 include: 127 Colorado buffware ceramic body sherds, 365 Tizon brownware ceramic body sherds, 69 green metavolcanic flakes (20 primary, 40 secondary, five tertiary and four shatter), six black metavolcanic secondary flakes, five brown quartzite flakes (two primary and three secondary), three secondary gray chert flakes, six white quartz flakes (four secondary, one tertiary and one shatter), nine banded reddish-brown chert secondary flakes, one black basalt secondary flake, one drilled brownware ceramic body sherd, one black basalt multi-directional core, one green metavolcanic core tool, one unifacially modified white quartz flake, one unifacial quartzite mano fragment, two Tizon brownware direct flattened lip rim sherds, three Tizon brownware direct rounded lip rim sherds, one Tizon brownware slight recurved flattened lip, one Tizon brownware neck sherd slightly recurved flattened lip, one Colorado buffware direct rounded lip, one green metavolcanic spent core, one green metavolcanic core/hammerstone, one green metavolcanic scraper tool, one green metavolcanic unifacially modified tool, one green metavolcanic hammerstone/chopper, one green metavolcanic bifacial, one bi-directional spent core, one distal end of a red/black banded chert mid to late stage biface, one green metavolcanic bifacial, one uni-directional core, one green metavolcanic bifacial multi-directional core, one green metavolcanic early stage biface with cortex present, one brown metavolcanic edge modified flake, one green metavolcanic unifacial tool with battering, one Cottonwood Series red/brown banded chert projectile point, one green metavolcanic unifacial core, one green metavolcanic uni-directional unifacial core and one multi-directional core.

Locus 6 is located out of the APE and is approximately 160 meters northwest of Locus 5. It measures 80 meters northeast to southwest by 28 meters northwest to southeast. Locus 6 contains a linear concentration of fire altered rock. The southwest portion contains 70% of the artifacts and the remaining artifacts are concentrated in the northeast half of the locus. Artifacts observed within Locus 6 include 151 Tizon brownware ceramic body sherds, 62 Colorado buffware ceramic body sherds, 56 green metavolcanic flakes (nine primary, 17 secondary and 30 tertiary), six brown and black mottled chert flakes (two primary and four secondary), two brown metavolcanic flakes (one secondary and one shatter), one black basalt flake, four light brown quartzite flakes (one primary and three secondary), one gray and black mottled chert flake, four light brown chalcedony flakes (two secondary and two shatter), three light gray chert flakes (one primary and two secondary), one Colorado buffware recurved rounded lip rim sherd, one Colorado buffware recurved rounded lip neck fragment sherd, one Colorado buffware slightly recurved rounded lip rim sherd and one Colorado buffware direct flattened lip rim sherd.

Locus 7 is located out of the APE and is approximately 66 meters northwest of Locus 6. It measures 100 meters north to south by 75 meters east to west. The southern portion of the locus contains a two square meter area of diffusely scattered, lithic, ceramic and indeterminate bone. All artifact counts represent an 80 to 90% sample of the artifacts observed at each locus. Artifacts observed within Locus 7 include: six petrified wood primary flakes, six cryptocrystalline primary flakes, 39 green metavolcanic (primary and secondary flakes), two black metavolcanic (secondary and tertiary flakes), four quartz primary flakes, 12 basalt primary flakes, one yellow jasper primary flake, two black metavolcanic cores, two green metavolcanic cores, two green metavolcanic core tools, one basalt core tool, one petrified wood core, one green metavolcanic cobble tool, one green metavolcanic retouched flake, one petrified wood tool, one Desert Side-notched Series projectile point, 70 Tizon brownware body sherds, one Tizon brownware direct rounded lip rim sherd, one Tizon brownware flat reinforced lip rim sherd, 133 Colorado buffware ceramic vessel body sherds, two Colorado buffware direct flattened lip rim sherds, two Colorado buffware direct rounded lip rim sherds, one Colorado buffware recurved, rounded lip rim sherd, six unidentified bone fragments and 13 fragments of fire-affected rock.

Locus 8 is located within the APE and is approximately 127 meters northeast of Locus 7. It measures 60 meters north to south by 38 meters east to west. Artifacts observed within Locus 8 include: one white chert edge-modified flake, one sandstone mano fragment, one porphyritic metavolcanic hammerstone, two sandstone metate fragments, one porphyritic metavolcanic flaked stone tool, three core tools (one porphyritic metavolcanic and two quartzite), 321 ceramic body vessel sherds (223 brownware and 98 buffware), 10 basal vessel sherds (seven brownware and three buffware), 58 porphyritic metavolcanic flakes (13 primary, 30 secondary, and 15 tertiary), 10 porphyritic metavolcanic shatter pieces, three quartzite flakes (all secondary), five petrified wood flakes (one secondary, one primary and three tertiary), six fine-grained basalt flakes (one primary, four secondary and one tertiary), five white chalcedonic chert flakes (all tertiary), three red jasper flakes (all tertiary), two yellow jasper flakes (all tertiary), 10 quartz flakes (five primary, one secondary and four tertiary), 13 ceramic buffware storage or cooking vessel rim sherds (five direct flattened lips-one exhibiting drilled mend hole; two direct rounded lips; two recurved rounded lips and four recurved flattened lips), three buffware ceramic olla neck rim sherds, 24 brownware storage or cooking vessel rim sherds (12 direct flattened lips; six direct rounded lips; two recurved rounded lips; three recurved flattened lip, and one recurved reinforced rim), six porphyritic metavolcanic cores (three multi-directional, one uni-directional and two unknown), one quartz uni-directional core and two cryptocrystalline siliceous cores (one multi-directional heat-treated and one uni-directional heat-treated). Additionally, 15 fist-sized, and at minimum 50 gravel-sized fire-affected rocks (mix of granitic, metavolcanic and sandstone) were observed within Locus 8, outside feature polygons. Several pieces of desiccated faunal bone (non-calcine) were also observed within Locus 8.

Locus 9 is located out of the APE and is approximately 475 meters southeast of Locus 8. It measures 195 meters northeast to southwest by 95 meters northwest to southeast. Locus 9 includes four features (F3 through F6). Artifacts observed within Locus 9 include: 75 green metavolcanic flakes, seven black metavolcanic flakes, 30 black basalt flakes, 10 chert flakes, 20 quartz flakes, 10 quartzite flakes, one petrified wood flake, two quartzite cores, one quartzite hammerstone, one tested quartzite cobble, one unifacial quartzite tool, one quartzite mano fragment, five green metavolcanic cores, one green metavolcanic hammerstone, three green metavolcanic core tools, one green metavolcanic unifacial tool, one quartz hammerstone, three black metavolcanic discodial unifacial cores, one black metavolcanic tool, two black metavolcanic chopping tools, one chert biface, one basalt core tool, at minimum 135 Colorado buffware ceramic vessel body sherds, one Colorado buffware direct rounded lip rim sherd, one Colorado buffware recurved rounded lip rim sherd, one Colorado buffware recurved flattened lip rim sherd, at minimum 250 Tizon brownware ceramic vessel body sherds, 37 Tizon brownware rim sherds, six Tizon brownware direct flattened lip rim sherd, three Tizon brownware direct rounded lip rim sherds, five Tizon brownware recurved rounded lip rim sherds, 13 Tizon brownware recurved, flattened lip rim sherds, five Tizon brownware reinforced direct lip rim sherds, two Tizon brownware reinforced recurved lip and six fragments of bone were observed outside of Feature 3.

Locus 10 is located out of the APE and is approximately 84 meters north-northwest of Locus 9. It measures 20 meters north to south by 13 meters east to west. Locus 10 includes one feature (F7). Artifacts observed within Locus 10 include three Tizon brownware ceramic vessel body sherds and at minimum 15 primary and secondary quartz flakes.

Locus 11 is located out of the APE and is approximately 367 meters southwest of Locus 10. It measures 25 meters north to south by 42 meters east to west. Locus 11 includes one feature (F8) located along the western margin of the locus. Artifacts observed in this location include: 120 Tizon brownware ceramic vessel body sherds (approximately 25% of the sherds have stucco coating), three Tizon brownware rim sherds (two direct rims rounded lip and one direct rim flattened lip), two bifaces (one cryptocrystalline projectile point tip and one quartz biface end), 35 green metavolcanic, quartz and cryptocrystalline flakes, two green metavolcanic unifacial tools, three green metavolcanic cores and one quartz core.

Locus 12 is located out of the APE and is approximately 187 meters east of Locus 11. It measures 50 meters north to south by 30 meters east to west. Artifacts observed within Locus 12 include: six basalt flakes, eight black metavolcanic flakes, 28 green metavolcanic flakes, one petrified wood flake, one chalcedony flake, one black basalt unifacially retouched core, one green metavolcanic unifacial scraper, one Tizon brownware ceramic direct rounded lip sherd and five Tizon brownware body sherds. Ceramics are concentrated on the eastern site of the locus, adjacent to an intermittent drainage, which flows across the eastern boundary of the locus. Fire affected rocks (sandstone, granite and metavolcanic materials) were observed throughout the site, with a higher concentration in the southern half of the site.

Locus 13 is located out of the APE and measures 57 meters east to west by 67 meters north to south. Locus 13 includes two features (F12 and F13). Artifacts observed in Locus 13 include 12 Colorado buffware ceramic vessel body sherds, 150 Tizon brownware ceramic vessel body sherds, 50 green metavolcanic flakes, two cryptocrystalline silicate chert flakes, one cryptocrystalline silicate jasper flake, 30 black metavolcanic flakes, 40 black basalt flakes and two quartz flakes. A Colorado buffware ceramic pot drop with a minimum of 100 fragments of ceramics (including body and rim sherds) was observed on the southeast portion of the locus boundary. The pot drop covers an area of two meters north to south by one meter east to west. Some of the ceramics observed at the locus are blackened suggestive of cooking vessels.

Locus 14 is located out of the APE and is approximately 490 meters west-southwest of Locus 13. It measures two meters north to south by one meter east to west. Artifacts observed within Locus 14 include 10 green metavolcanic flakes.

Locus 15 is located out of the APE and is approximately 58 meters northeast of Locus 14. It measures two meters north to south by two meters east to west. Artifacts observed within Locus 15 include: two black metavolcanic hammerstones, one metavolcanic core and at minimum 20 metavolcanic flakes.

Locus 16 is located out of the APE and is approximately 38 meters southwest of Locus 15. It measures three meters north to south by two meters east to west. Artifacts observed within Locus 16 include one black metavolcanic core and at minimum 10 metavolcanic flakes.

Locus 17 is located out of the APE and is approximately 21 meters northeast of Locus 16. It measures one meter north to south by one meter east to west. Artifacts observed within Locus 17 include one black metavolcanic core and at minimum 110 black metavolcanic flakes.

Locus 18 is located within the APE and is approximately 1,213 meters northeast of Locus 17 and approximately 118 meters northeast from Locus 1 (nearest locus). Locus 18 measures 39 meters northeast to southwest by 15 meters northwest to southeast. Artifacts observed within Locus 18 include: one porphyritic metavolcanic bi-directional core, one brownware body sherd and one basalt core tool. However, upon revisit (Sept.2009), recent sheetwash flooding has obliterated 90% of locus with 25 porphyritic metavolcanic flakes that had been previously recorded not relocated.

Locus 19 is located out of the APE and is approximately 1,224 meters south-southwest of Locus 18. It measures 11 meters north to south by 17 meters east to west. Artifacts observed within Locus 19 include: four metavolcanic cores, one metavolcanic tested cobble and at minimum 50 metavolcanic flakes.

Locus 20 is located out of the APE and is approximately 14 meters northeast of Locus 19. It measures one meter north to south by one meter east to west. Artifacts observed within Locus 20 include one metavolcanic core, one tested metavolcanic cobble and 15 metavolcanic flakes.

Locus 21 is located out of the APE and is approximately 10 meters north-northwest of Locus 20. It measures two meters north to south by two meters east to west. Artifacts observed within Locus 21 include 15 metavolcanic flakes.

Locus 22 is located out of the APE and is approximately 16 meters northwest of Locus 21. Locus 22 measures one meter north to south by one meter east to west. Artifacts observed within Locus 22 include: one hammerstone, one metavolcanic core and 20 metavolcanic flakes.

Locus 23 is located out of the APE and is approximately nine meters west-northwest of Locus 22. It measures five meters north to south by five meters east to west. Artifacts observed within Locus 23 include one green metavolcanic core and at minimum 25 metavolcanic flakes.

Locus 24 is located out of the APE and is approximately 36 meters east of Locus 23. It measures one meter north to south by one meter east to west. Artifacts observed within Locus 23 include 15 black metavolcanic flakes.

Locus 25 is located out of the APE and is approximately 22 meters northeast of Locus 24. It measures two meters north to south by four meters east to west. Artifacts observed within Locus 25 include: one metavolcanic hammerstone, one metavolcanic core, one metavolcanic core tool and at minimum 25 quartzite, metavolcanic and basalt flakes.

Locus 26 is located out of the APE and is approximately 26 meters north-northwest of Locus 25. It measures one meter north to south by one meter east to west. Artifacts observed within Locus 26 include: one metavolcanic core, one tested metavolcanic cobble and five metavolcanic flakes.

Locus 27 is located out of the APE and is approximately seven meters north of Locus 26. It measures one meter north to south by one meter east to west. Artifacts observed within locus 27 include at minimum 10 metavolcanic flakes.

Locus 28 is located out of the APE and is approximately 24 meters southeast of Locus 27. It measures two meters north to south by two meters east to west. Artifacts observed within Locus 28 include: one hammerstone, one tested quartzite cobble, one metavolcanic core and at minimum15 metavolcanic flakes.

Locus 29 is located out of the APE and is approximately 26 meters northeast of Locus 28. It measures five meters north to south by five meters east to west. Artifacts observed within Locus 29 include two metavolcanic cores and at minimum 40 metavolcanic flakes.

Locus 30 is located out of the APE and is approximately 26 meters southeast of Locus 29. It measures one meter north to south by one meter east to west. Artifacts observed within Locus 30 include two metavolcanic core and at minimum five metavolcanic flakes.

Locus 31 is located out of the APE and is approximately 36 meters north-northwest of Locus 30. It measures two meters north to south by two meters east to west. Artifacts observed within Locus 31 include one brown chert core tool and at minimum five quartzite and cryptocrystalline silicate chert flakes.

Locus 32 is located out of the APE and is approximately 34 meters northeast of Locus 31. It measures one meter north to south by three meters east to west. Artifacts observed within Locus 32 include: one green metavolcanic hammerstone, one metavolcanic core and at minimum five metavolcanic flakes.

Locus 33 is located out of the APE and is approximately 11 meters northeast of Locus 32. It measures 13 meters northeast to southwest by 10 meters northwest to southeast. Artifacts observed within Locus 33 include two ceramic vessel rim fragments and at minimum15 body sherds of Tizon brownware.

Locus 34 is located out of the APE and is approximately 117 meters southwest of Locus 33. It measures one meter north to south by one meter east to west. Artifacts observed within Locus 34 include at minimum 20 metavolcanic flakes.

Locus 35 is located out of the APE and is approximately 47 meters south of Locus 34. It measures two meters north to south by three meters east to west. Artifacts observed within Locus 35 include at minimum 25 metavolcanic flakes and five or more fire-affected cobbles.

Locus 36 is located out of the APE and is approximately 116 meters north-northeast of Locus 35. It measures one meter north to south by one meter east to west. Artifacts observed within Locus 36 include one metavolcanic core and at minimum 10 metavolcanic flakes.

Locus 37 is located out of the APE and is approximately 85 meters southwest of Locus 36. It measures one meter north to south by one meter east to west. Artifacts observed within Locus 37 include one quartzite hammerstone and at minimum three basalt flakes.

Locus 38 is located out of the APE and is approximately 76 meters north of Locus 38. It measures one meter north to south by one meter east to west. Artifacts observed within Locus 38 include one metavolcanic core and six metavolcanic flakes.

Locus 39 is located out of the APE and is approximately 50 meters northwest of Locus 38. It measures 50 meters northeast to southwest by 20 meters northwest to southeast. Artifacts observed within Locus 39 include: 114 Tizon brownware ceramic vessel body fragments, 10 Tizon brownware ceramic rim sherds, 62 Colorado buffware ceramic vessel body fragments, 11 cores (10 metavolcanic and one petrified wood), one fire altered basalt core tool, one quartzite hammerstone, 64 metavolcanic flakes, 26 cryptocrystalline flakes, five quartzite flakes, three petrified wood flakes, three quartzite flakes and five unidentified marine shell fragments.

Locus 40 is located out of the APE and is approximately 99 meters south-southwest of Locus 39. It measures one meter north to south by one meter east to west. Artifacts observed within Locus 40 include one cryptocrystalline silicate core and 10 cryptocrystalline silicate flakes.

Locus 41 is located out of the APE and is approximately 26 meters northwest of Locus 40. It measures three meters north to south by two meters east to west. Artifacts observed within Locus 41 include 15 milky white quartz flakes.

Locus 42 is located out of the APE and is approximately 134 meters northeast of Locus 41. It measures one meter north to south by one meter east to west. Artifacts observed within Locus 42 include one basalt core tool and six basalt flakes.

Locus 43 is located out of the APE and is approximately 47 meters northwest of Locus 42. It measures nine meters north to south by four meters north to south. Artifacts observed within Locus 43 include: 16 Tizon brownware ceramic vessel body fragments, seven Colorado buffware ceramic vessel body fragments, one gray cryptocrystalline hammerstone and one black speckled chert flake.

Locus 44 is located out of the APE and is approximately 40 meters northeast of Locus 43. It measures five meters north to south by two meters east to west. Artifacts observed within Locus 44 include 26 Colorado buffware ceramic vessel body fragments.

Locus 45 is located out of the APE and is approximately 80 meters southwest of Locus 44. It measures three meters east to west by three meters north to south. Artifacts observed within Locus 45 include: two metavolcanic cores, 27 metavolcanic flakes and nine quartz flakes.

Locus 46 is located out of the APE and is approximately 137 meters southeast of Locus 45. It measures four meters east to west by two meters north to south . Artifacts observed within Locus 46 include one brown cryptocrystalline silicate core and at minimum 20 metavolcanic and cryptocrystalline silicate flakes.

Locus 47 is located out of the APE and is approximately 143 meters north-northwest of Locus 46 and measures six meters east to west by three meters north to south. Artifacts observed within Locus 47 include one possible basalt hammerstone and at minimum 20 metavolcanic flakes.

Locus 48 is located out of the APE and is approximately 64 meters northwest of Locus 47. It measures four meters north to south by four meters east to west. Artifacts observed within Locus 48 include two metavolcanic cores and at minimum 20 metavolcanic flakes.

Locus 49 is located out of the APE and is approximately 89 meters northeast of Locus 48. It measures one meter north to south by one meter east to west. Artifacts observed within Locus 49 include one green cryptocrystalline core and three green cryptocrystalline flakes.

Locus 50 is located out of the APE and is approximately 67 meters west-southwest of Locus 49. It measures 102 meters east to west by 50 meters north to south. Artifacts observed within Locus 50 include: 391 ceramic vessel fragments (227 Tizon brownware and 164 Colorado buffware), 36 ceramic rim sherds (17 Colorado buffware and 19 Tizon brownware), 18 cores (12 metavolcanic, five cryptocrystalline silicate and one basalt), two metavolcanic tested cobbles, 279 flakes (162 metavolcanic, 80 cryptocrystalline silicate, 17 quartz, 18 petrified wood and two basalt). A potential human cremation was also observed in this location measuring four meters north to south by five meters east to west. The cremation consists of approximately 25 or more calcined long bone and cranial bone fragments. Ceramic vessel and rim fragments were observed within the extent of the cremation.

Locus 51 is located out of the APE and is approximately 167 meters southeast of Locus 50. It measures 48 meters north to south by 38 meters east to west. Artifacts observed within Locus 51 include: 51 flakes (40 metavolcanic, eight cryptocrystalline silicate and three basalt), five cores (four metavolcanic and one cryptocrystalline silicate), 117 ceramic vessel fragments (78 Tizon brownware and 39 Colorado buffware), 10 ceramic rim sherds (five Tizon brownware and five Colorado buffware). In addition, a potential human cremation is reported but unconfirmed within this locus. A minimum of 50 calcined bong fragments were observed and included in what archaeologists interpreted to be long bone and cranial fragments. This locus also included ceramic sherds and an unidentified projectile point. The area immediately surrounding Locus 51 (possible cremation) was recorded separately from the surrounding locus. These artifact include: 22 flakes (17 metavolcanic, one cryptocrystalline silicate, three quartz and one basalt), 88 ceramic vessel fragments (14 Tizon brownware and 74 Colorado buffware) and four Colorado buffware ceramic rim sherds.

Locus 52 is located out of the APE and is approximately 56 meters southeast of Locus 51. It measures 27 meters east to west by 17 meters north to south. Artifacts observed within Locus 52 include: 30 ceramic vessel body fragments (five Tizon brownware and 25 Colorado buffware), two ceramic rim sherds (one Colorado buffware and one Tizon brownware), 18 flakes (three quartz, eight metavolcanic, five basalt and two cryptocrystalline silicate), four cores (two quartz and two metavolcanic) and one metavolcanic core tool. A possible human cremation was observed on the surface within the locus, which includes at minimum 20 high fragmented long bone and cranial calcined bones. Artifacts associated with the cremation include: five whole lively beads (four of which are fire-affected), 38 ceramic vessel sherds (15 Tizon brownware and 23 Colorado buffware), four Colorado buffware ceramic rim fragments, 10 flakes (one quartz, two metavolcanic, three basalt and four cryptocrystalline silicate) and one metavolcanic core.

Locus 53 is located out of the APE and is approximately 26 meters northeast of Locus 52. It measures 26 meters north to south by 22 meters east to west. Artifacts observed within Locus 53 include, at minimum: 60 vessel fragments (40 Colorado buffware and 20 Tizon brownware), 10 Colorado buffware ceramic rim sherds, one black metavolcanic core and 40 flakes of various materials including metavolcanic, cryptocrystalline, quartz and quartzite. A possible human cremation was observed on the surface which includes at minimum 21 pieces of highly fragmented calcined long bone and cranial bones that appear to be very weathered and splintered. A single complete Olivella shell bead and a complete Desert Side-notched Series projectile point were also observed at this location.

Locus 54 is located out of the APE and is approximately 183 meters southwest of Locus 53. It measures 16 meters north to south by 14 meters east to west. Artifacts observed within Locus 54 include, at a minimum: 35 Tizon brownware and Colorado buffware ceramic vessel body sherd fragments, one quartz Desert Side-notched Series point, one drill tip fragment, one chalcedony edge modified flake, one metavolcanic chopper, one metavolcanic core tool, and at a minimum 40 flakes of a variety of materials including metavolcanic, quartz, cryptocrystalline, basalt and petrified wood. This location also contains four articulated fish vertebrae, some of which are fire-affected, and one small stick with flat, cut edges on both sides.

Locus 55 is located out of the APE and is approximately 222 meters northeast of Locus 54. It measures 100 meters north to south by 78 meters east to west. Artifacts observed within Locus 54 include, at a minimum: 33 ceramic rim sherds (15 Colorado buffware and 18 Tizon brownware), 635 ceramic vessel sherds (595 Colorado buffware, 40 Tizon brownware - some display stucco and drilled holes), six hammerstones, 11 stone tools including core tools, scrapers, and choppers, 32 cores, one edge modified flake, one utilized flake, 297 flakes (206 green and black metavolcanic, 42 cryptocrystalline silicate, 21 basalt, 20 quartz and eight quartzite) and one stone bowl and groundstone. A possible human cremation was observed on the surface which includes at minimum 15 highly calcined bone fragments and five fire affected rock concentrations associated with it, as well as the remains of a fish, observed in a cut bank along the eastern edge of the locus.

Locus 56 is located out of the APE and is approximately 331 meters northeast of Locus 55. It measures 240 meters northeast to southwest by 73 meters northwest to southeast. Artifacts observed within Locus 56 include, at a minimum: 139 ceramic rim and body fragments (47 Colorado buffware and 92 Tizon brownware sherds with rim sherds displaying direct flat, direct round and recurved flat construction), 135 pieces of debitage (97 green metavolcanic flakes, 15 dark green metavolcanic flakes, five chert, 16 quartz/quartzite and two chalcedony flakes), six green metavolcanic tested cobbles and 40 primarily multi-directional and bifacial cores.

Locus 57 is located out of the APE and is approximately 250 meters southwest of Locus 56. It measures 73 meters north to south by 70 meters east to west. Artifacts observed within Locus 57 include, at a minimum: 395 Tizon brownware sherds, 399 sherds of Colorado buffware (rim sherds display direct flat, direct rounded, recurved flat, and recurved round construction), 215 metavolcanic flakes, 77 cryptocrystalline flakes, 20 quartzite flakes, 45 quartz flakes, 27 basalt flakes, two petrified wood flakes, 26 cores, six edge modified flakes, five hammerstones, eight core tools, one utilized flake and one tested cobble. A possible human cremation was observed on surface, consisting of 10 unidentified bone fragments. Also observed within the locus were five fish, two mammal and 62 unidentifiable bone fragments.

Locus 58 is located out of the APE and is approximately 131 meters west of Locus 57. It measures 22 meters north to south by 23 meters east to west. Artifacts observed within Locus 58 include lithic and ceramic scatter with one hearth feature. Fire-affected rock occurs throughout the locus and the site appears to have been subject to pot hunting. Artifacts observed within Locus 58 include: 88 ceramic vessel and rim sherds displaying direct flat and direct rounded construction (39 Tizon brownware and 49 Colorado buffware), 38 flakes (24 metavolcanic, five cryptocrystalline silicate, four quartz, three petrified wood and two basalt), one green metavolcanic utilized flake, one metavolcanic core tool, one cryptocrystalline edge modified flake, one metavolcanic chopping tool, one cryptocrystalline silicate core tool and one cryptocrystalline silicate Cottonwood Series projectile point (preform).

Locus 59 is located out of the APE and is approximately 127 meters northeast of Locus 58. It measures 102 meters east to west by 54 meters north to south. Artifacts observed within Locus 59 include: shell pendants, fire affected rock, 102 Tizon brownware sherds, 174 Colorado buffware sherds (rim sherds display direct, flat, direct round, and recurved flat construction), 185 flakes (146 metavolcanic, 16 cryptocrystalline silicate, four quartzite, 13 quartz and six basalt), five edge modified flakes, 19 cores (two bifacially retouched), two hammerstones, 12 core tools, one chopper and three tested cobbles. Bones include 10 fish and 13 unidentifiable fragments, some being highly calcined and possibly be human.

Locus 60 is located out of the APE and is approximately 145 meters north-northwest of Locus 59. It measures 80 meters northeast to southwest by 44 meters northwest to southeast. Artifacts observed within Locus 60 include: unidentifiable shell fragments, 81 sherds of Tizon brownware, 42 sherds of Colorado buffware (Colorado buffware rim types include direct flat, direct round and recurved flat), one drilled Colorado buffware rim sherd, 17 flakes (14 metavolcanic, two cryptocrystalline silicate and one basalt), four lithic tools, two core tools and one utilized flake.

Locus 61 is located out of the APE and is approximately 180 meters northwest of Locus 60. It measures 192 meters northeast to southwest by 52 meters northwest to southeast, forming an oval shape upon a low-lying landform divided by a drainage. Artifacts observed at Locus 61 include: 191 sherds of Tizon brownware, 250 sherds of

Colorado buffware (ceramic rim types include direct rounded, direct flat, recurved flat and rounded), 65 metavolcanic flakes, four quartz flakes, eight cores and one unidentifiable shell fragment. Locus 61 is a lithic and ceramic scatter associated with three cremation features. The first cremation contains 30 to 40 fragments of burned human bone, 40 ceramic sherds and limited lithic constituents. The second cremation contains 40 fragments of burned human bone, 20 ceramic sherds and limited lithic constituents. The third cremation is composed of 20 fragments of burned human bone, 20 ceramic sherds and limited lithic constituents. Two hearths were located in the eastern portion of the locus. On November 11, 2008 URS physical anthropologist Robert Mutaw visited this locus and identified a human infant mandible fragment, a proximal ulna fragment, and a proximal right humerus fragment; concluding that there is a 99 % certainty that this locus contains human remains.

Locus 62 is located out of the APE and is approximately 192 meters southwest of Locus 61. It measures 154 meters north to south by 126 meters east to west. Locus 62 is associated with an unconsolidated hearth feature. Artifacts observed within Locus 62 include: 180 metavolcanic flakes, 15 cryptocrystalline flakes, 14 basalt flakes, 13 quartz flakes, four quartzite flakes, two petrified wood flakes, one chalcedony flake, three sandstone groundstone fragments, four hammerstones, two edge modified flakes, 13 core tools, 20 cores, two broken unidentified projectile points, one petrified wood tool, 142 Tizon brownware sherds and 266 Colorado buffware sherds (rim types include direct flat, direct round, and recurved). Stucco coating is present on less than 10% of both ware types, and drill holes are present on one rim and one body sherd. Bones observed within Locus 62 include 10 highly calcined, possibly human fragments and some bird bones. This locus appears to have a high potential for subsurface deposits.

Locus 63 is located out of the APE and is approximately 165 meters southeast of Locus 62. It measures 96 meters northeast to southwest by 33 meters northwest to southeast. Locus 63 is associated with a hearth feature. Artifacts observed within Locus 63 include: 40 Tizon brownware sherds, 42 Colorado buffware sherds (rim types include direct flat, indirect flat and recurved flat), 88 flakes (72 metavolcanic, three basalt, seven cryptocrystalline silicate, two quartz, three quartzite one petrified wood), five cores, six core tools, one edge modified flake, one utilized flake, two hammerstones and one cryptocrystalline silicate jasper projectile point base. No bone was observed on the surface at this locus; however, given the close proximity of this locus with loci containing human bone, the potential for subsurface deposits is high.

Locus 64 is located out of the APE and is approximately 286 meters southeast of Locus 63. It measures 247 meters east to west by 90 meters north to south. Locus 64 is associated with seven hearth features and one human cremation. Artifacts observed within Locus 64 include: 247 flakes (199 metavolcanic, nine basalt, 10 quartz, six quartzite, 21 cryptocrystalline silicate, one gypsum and one petrified wood), four manos, three metate fragments, 14 tested cobbles, 18 cores, eight core tools, one edge modified flake, eight hammerstones, one Desert Side-notched Series projectile point and one Cottonwood Series projectile point. Ceramics observed within the locus include at minimum 604 ceramic rim and vessel sherds (266 Tizon brownware, 338 Colorado buffware), with rim types displaying direct flat, direct rounded, flat lipped, lipped, recurved round and recurved flat forms. Three sherds of Colorado buffware display drill holes and others have a stucco coating on the surface. One Colorado buffware sherd has a yellowish-white slip. Bone fragments include one tortoise carapace fragment, six unknown bone fragments and 12 highly calcined human bone fragments.

Locus 65 is located out of the APE and is approximately 205 meters northeast of Locus 64. It measures 115 meters north to south by 162 meters east to west. Artifacts observed within Locus 65 include: 274 ceramic rim and body sherds (164 Tizon brownware and 110 Colorado buffware; rim types include direct flat, direct rounded, and recurved flat), at a minimum 168 flakes (125 metavolcanic, 10 basalt, 12 cryptocrystalline silicate, 13 quartz, six quartzite, and two petrified wood), six tested cobbles, 12 cores, nine core tools, one edge modified flake, two quartzite hammerstones, two metate fragments, four manos and one marine shell fragment with a hinge. In addition, a minimum of 30 bone fragments were observed, including unknown species, fish and possibly human.

Locus 66 is located out of the APE and is approximately 187 meters southeast of Locus 65. It measures 20 meters northeast to southwest by 62 meters southeast to northwest. Artifacts observed within Locus 66 include: eight ceramic sherds (two Tizon brownware and six Colorado buffware), 23 flakes (16 metavolcanic, two cryptocrystalline silicate, two quartzite, one quartz, one basalt and one petrified wood), two cores and one test cobble. A mano was observed near the locus.

Locus 67 is located out of the APE and is approximately 1,276 meters northwest of Locus 66, approximately 506 meters west-southwest from Locus 18 and approximately 79 meters west from Locus 8 (nearest locus). It measures 156 meters northeast to southwest by 79 meters northwest to southeast. A total of 868 artifacts were observed within Locus 67. They include 140 brownware body vessel sherds (four fire-affected and six having a scum coat residue), 220 buffware body vessel sherds (five exhibiting horizontal incised lines and 10 fire-affected), 19 buffware body vessel sherds exhibiting a light tan, dull exterior, 28 red buffware body vessel sherds, five brownware basal vessel sherds, 13 buffware basal vessel sherds, 11 brownware storage/cooking vessel rim sherds (three direct, flattened lips; one direct, reinforced rim; three direct, rounded lips; three slightly recurved, rounded lips; and one recurved, flattened lip fire-affected), 28 buffware storage/cooking vessel rim sherds (two slightly recurved, flattened lips; 12 direct, rounded lips; one recurved, reinforced rim; four slightly recurved, rounded lips; three slightly recurved, rounded exhibiting horizontal incised lines; two slightly recurved, rounded having a mend hole; one direct, flattened lip; and three dramatically recurved, rounded lips), three buffware olla neck rim fragments (all slightly recurved, rounded), one porphyritic metavolcanic battered cobble, one quartzite battered cobble, one quartz battered cobble, two porphyritic metavolcanic hammerstones, two quartzite hammerstones, five porphyritic metavolcanic cores (four multi-directional, one uni-directional), three quartzite cores (two uni-directional, one multi-directional), one cryptocrystalline silicate multi-directional core, three porphyritic metavolcanic edge-modified flakes, two porphyritic metavolcanic flaked stone tools, one quartzite scraper, one basalt scraper, three crypto-crystalline silicate edge-modified flakes, two porphyritic metavolcanic core tools, three quartzite core tools, four Cottonwood Series type projectile points (two clear quartz crystal and two white chalcedony), seven crypto-crystalline silicate bifaces preform/point blank stage, two clear quartz crystal bifaces preform/point blank stage, one porphyritic metavolcanic utilized primary flake, one granitic unifacial mano, one gray chert knife or scraper, 160 porphyritic metavolcanic flakes (31 primary, 81 secondary and 48 tertiary), 38 porphyritic metavolcanic angular shatter pieces, one porphyritic metavolcanic tested cobble, 50 crypto-crystalline silicate flakes (nine primary, 29 secondary, and 12 tertiary), one crypto-crystalline silicate shatter piece, one crypto-crystalline silicate tested cobble, 33 quartz flakes (15 primary, 11 secondary and seven tertiary), nine quartz angular shatter pieces, five quartzite flakes (two primary, one secondary and two tertiary), two quartzite angular shatter pieces, 12 basalt flakes (five primary, six secondary and one tertiary), six fine-grained igneous flakes (three primary, one secondary and two tertiary), two petrified wood flakes (one primary and one secondary), one secondary siltstone flake, two siltstone angular shatter pieces and one wonderstone secondary flake. Additionally, 30 or more small cobble-sized fire-affected rocks can be observed across the locus, outside of the Feature 17, 19, and 20 boundaries. They are largely disarticulated from preexisting hearths or pits and subjected to redeposition. Several faunal bone pieces can be observed proximal to these fire-affected rocks. However, they are too weathered for identification of thermal alteration and much too sparsely distributed.

Locus 68 is located within the APE and is approximately 105 meters northeast from Locus 67. It measures 11 meters northwest to southeast by nine meters northeast to southwest. Artifact inventory was conducted based on a two by two meter sample study unit (SSU-3) superimposed over highest artifact density within this locus. A total of 76 artifacts were observed within SSU-3, they include: 13 red buffware body vessel sherds, 37 brownware body vessel sherds, four buffware body vessel sherds, 11 porphyritic metavolcanic flakes (two primary, three secondary, and six tertiary), one porphyritic metavolcanic angular shatter piece, two mottled chert tertiary flakes, three quartzite flakes (one secondary and two tertiary), one basalt edge-modified flake, one chert flaked stone tool, one porphyritic metavolcanic battered cobble, and two fragmented brownware cooking/storage vessel rim sherds direct, rounded lip which refit each other. Three additional brownware cooking/storage vessel rim sherds-all direct, rounded-were observed within locus, outside SSU-3. More than 50 artifacts could be observed outside SSU-3, frequencies and types consistent with those within sample inventory. 10 or more fire-affected small cobbles are scattered across locus, outside of Feature 24, two of which occur within SSU-3.

Locus 69 is located within the APE and is approximately 63 meters north-northeast from Locus 68. It measures seven meters northwest to southeast by three meters northeast to southwest. A total of 51 artifacts were observed within Locus 69, they include: 12 buffware body vessel sherds, six red buffware body sherds, five brownware body vessel sherds, 17 porphyritic metavolcanic flakes (five primary, 10 secondary and two tertiary), four porphyritic metavolcanic angular shatter pieces, five basalt flakes (four secondary and one tertiary), one porphyritic metavolcanic multi-directional core, and one buffware cooking/storage vessel direct rim sherd, flattened lip. Ten small cobbles of fire-affected sandstone and metavolcanic rock were observed scattered across locus.

Locus 70 is located within the APE and is approximately 1,483 meters southeast of Locus 69. It measures 29 meters north to south by 16 meters east to west. Artifacts observed within Locus 70 include: three metavolcanic flakes (one primary and two secondary), one fine grain quartzite secondary flake, one chalcedony shatter and one cryptocrystalline silicate chert secondary flake.

Locus 71 is located within the APE and is approximately 46 meters southeast of Locus 70. It measures six meters north to south by four meters east to west. Artifacts observed within Locus 71 include: 12 metavolcanic flakes (two primary, four secondary and six tertiary), one metavolcanic tested cobble and three fine grain quartzite secondary flakes.

Locus 72 is located within the APE and is approximately 16 meters northwest of Locus 71. It measures three meters north to south by three meters east to west. Artifacts observed within Locus 72 include two fine grain quartzite secondary flakes and one metavolcanic fire-affected rock (FAR).

Locus 73 is located within the APE approximately 18 meters north-northeast of Locus 72 and measures four meters east to west by three meters north to south. Artifacts observed within Locus 73 include: five metavolcanic flakes (one primary, two secondary, one tertiary and one shatter), one metavolcanic tested cobble, five fine grain quartzite flakes (two primary, one secondary and two tertiary) and one fine grain quartzite tested cobble.

Locus 74 is located out of the APE and is approximately six meters west-southwest of Locus 73. It measures four meters north to south by two meters east to west. Artifacts observed within Locus 74 include: approximately 35 metavolcanic flakes (23 primary, 10 secondary and two shatter), one chalcedony primary flake, three green metavolcanic multi-directional cores, one green metavolcanic uni-directional core and one tested green metavolcanic cobble.

Locus 75 is located out of the APE and is approximately eight meters east of Locus 74. It measures three meters north to south by two meters east to west. Artifacts observed within Locus 75 include approximately 40 quartz flakes (28 primary, eight secondary and four shatter) and one white/pink quartz multi-directional core.

Locus 76 is located out of the APE and is approximately 1,111 meters southwest of Locus 75. It measures two meters north to south by two meters east to west. Artifacts observed within Locus 76 include: three black metavolcanic flakes (two primary and one secondary), 10 wonderstone primary flakes and one cryptocrystalline silicate primary flake.

Locus 77 is located out of the APE and is approximately 16 meters west of Locus 76. It measures two meters north to south by two meters east to west. Artifacts observed within Locus 76 include seven cryptocrystalline silicate flakes (five primary and two secondary).

Locus 78 is located out of the APE and is approximately 46 meters north of Locus 77. It measures two meters north to south by two meters east to west. Artifacts observed within Locus 78 include 13 brown cryptocrystalline silicate flakes (six primary and seven secondary) ranging in size from two to five centimeters and one brown cryptocrystalline silicate multi-directional core.

Locus 79 is located out of the APE and is approximately 21 meters northeast of Locus 78. It measures three meters north to south by two meters east to west. Artifacts observed within Locus 79 include 15 green metavolcanic flakes (12 primary, two secondary and one shatter) and one green metavolcanic multi-directional core.

Locus 80 is located out of the APE and is approximately 40 meters east of Locus 79. It measures four meters north to south by two meters east to west. Artifacts observed within Locus 80 include: 10 green metavolcanic flakes (four primary and six secondary), one green metavolcanic bi-directional core, one green metavolcanic multi-directional core and one green metavolcanic hammerstone.

Locus 81 is located out of the APE and is approximately 14 meters northeast of Locus 80. It measures two meters north to south by two meters east to west. Artifacts observed within Locus 81 include six black metavolcanic flakes (three primary and three secondary) and one black metavolcanic bi-directional core.

Locus 82 is located out of the APE and is approximately five meters south of Locus 81. It measures one meter north to south by two meters east to west. Artifacts observed within Locus 82 include five green metavolcanic flakes (four primary and one secondary) and one green metavolcanic uni-directional core.

Locus 83 is located out of the APE and is approximately 17 meters south of Locus 82. It measures one meter north to south by two meters east to west. Artifacts observed within Locus 83 include 15 petrified wood flakes (10 primary and five secondary) and one tested petrified wood cobble.

Locus 84 is located out of the APE and is approximately 23 meters north-northeast of Locus 83. It measures two meters north to south by two meters east to west. Artifacts observed within Locus 84 include: seven green metavolcanic primary flakes, one tested green metavolcanic cobble (three fragments that refit) and two white cryptocrystalline silicate tested cobbles.

Locus 85 is located out of the APE and is approximately 38 meters south of Locus It84. It measures two meters north to south by two meters east to west. Artifacts observed within Locus 85 include: 10 green metavolcanic flakes (six primary and four secondary), two green metavolcanic bi-directional cores and one green metavolcanic multi-directional core.

Locus 86 is located out of the APE and is approximately five meters south-southeast of Locus 85. It measures one meter north to south by one meter east to west. Artifacts observed within Locus 86 include: four brown cryptocrystalline silicate flakes (three primary and one secondary), one cryptocrystalline silicate bi-directional core and seven quartz flakes (five primary and two secondary) and one quartz multi-directional core.

Locus 87 is located out of the APE and is approximately 1,010 meters northeast of Locus 86. It measures one meter north to south by one meter east to west. Artifacts observed within Locus 87 include: 10 quartz flakes (five primary and five secondary), one quartz bi-directional core and one quartz multi-directional core.

Locus 88 is located out of the APE and is approximately 44 meters southwest of Locus 87. It measures four meters north to south by two meters east to west. Artifacts observed within Locus 88 include: three gray cryptocrystalline silicate primary flakes, one cryptocrystalline silicate multi-directional core, 10 quartz flakes (five primary and five secondary) and one quartz bi-directional core.

Locus 89 is located out of the APE and is approximately 12 meters south of Locus 88. It measures two meters north to south by one meter east to west. Artifacts observed within Locus 89 include: 13 green metavolcanic flakes (eight primary and five secondary), one green metavolcanic bi-directional core and one green metavolcanic multi-directional core.

Locus 90 is located out of the APE and is approximately 12 meters east-southeast of Locus 89. It measures two meters north to south by one meter east to west. Artifacts observed within Locus 90 include: five metavolcanic primary flakes, one green metavolcanic bi-directional core and one green metavolcanic multi-directional core.

Locus 91 is located out of the APE and is approximately 52 meters west of Locus 90. It measures two meters north to south by three meters east to west. Artifacts observed within Locus 91 include: 20 cryptocrystalline silicate flakes (10 primary and 10 secondary), five green cryptocrystalline silicate primary flakes and one cryptocrystalline silicate bi-directional core.

Locus 92 is located out of the APE and is approximately 87 meters southwest of Locus 91. It measures three meters north to south by two meters east to west. Artifacts observed within Locus 92 include 30 cryptocrystalline silicate flakes (12 primary and 18 secondary) and one brown cryptocrystalline silicate multi-directional exhausted core.

Locus 93 is located out of the APE and is approximately 44 meters southeast of Locus 92. It measures three meters north to south by two meters east to west. Artifacts observed within Locus 93 include 20 metavolcanic flakes (10 primary and 10 secondary) and one black metavolcanic multi-directional core.

Locus 94 is located out of the APE and is approximately 269 meters northeast of Locus 93. It measures three meters north to south by two meters east to west. Artifacts observed within Locus 94 include 15 metavolcanic flakes (five primary and 10 secondary) and one black metavolcanic multi-directional core.

Locus 95 is located out of the APE and is approximately 125 meters south-southwest of Locus 94. It measures three meters north to south by three meters east to west. Artifacts observed within Locus 95 include 20 metavolcanic flakes (four primary and 16 secondary).

Locus 96 is located out of the APE and is approximately 90 meters northwest of Locus 95. It measures two meters north to south by one meter east to west. Artifacts observed within Locus 96 include 25 white quartz flakes (13 primary, 10 secondary and two shatter) and one white quartz uni-directional core.

Locus 97 is located out of the APE and is approximately 42 meters east-southeast of Locus 96. It measures two meters north to south by one meter east to west. Artifacts observed within Locus 97 include three black metavolcanic primary flakes and one black metavolcanic multi-directional core with three extraction scars.

Locus 98 is located out of the APE and is approximately 108 meters northeast of Locus 97. It measures six meters north to south by three meters east to west. Artifacts observed within Locus 98 include 25 black metavolcanic flakes (15 primary and 10 secondary) and one black metavolcanic multi-directional core with seven extraction scars.

Locus 99 is located out of the APE and is approximately 32 meters northeast of Locus 98. It measures two meters north to south by two meters east to west. Artifacts observed within Locus 99 include 35 metavolcanic flakes (21 primary and 14 secondary) and one green metavolcanic multi-directional core with four extraction scars.

Locus 100 is located out of the APE and is approximately 18 meters northeast of Locus 99. It measures four meters north to south by two meters east to west. Artifacts observed within Locus 100 include 10 black metavolcanic flakes (eight primary and two secondary) and one black metavolcanic multi-directional core with seven extraction scars.

Locus 101 is located out of the APE and is approximately 64 meters south-southwest of Locus 100. It measures four meters north to south by three meters east to west.

Artifacts observed within Locus 101 include 30 metavolcanic flakes (15 primary and 15 secondary) and one cryptocrystalline silicate secondary flake.

Locus 102 is located out of the APE and is approximately eight meters south of Locus 101. It measures one meter north to south by one meter east to west. Artifacts observed within Locus 102 include 10 metavolcanic flakes (seven primary and three secondary) and one green metavolcanic multi-directional core with three extraction scars.

Locus 103 is located out of the APE and is approximately 93 meters north-northeast of Locus 102. It measures two meters north to south by three meters east to west. Artifacts observed within Locus 103 include 30 green metavolcanic flakes (24 primary and six secondary) and one green metavolcanic bi-directional core with four extraction scars.

Locus 104 is located out of the APE and is approximately 48 meters northwest of Locus 103. It measures two meters north to south by one meter east to west. Artifacts observed within Locus 103 include 10 black metavolcanic flakes (nine primary and one secondary).

Locus 105 is located out of the APE and is approximately 73 meters southeast from Locus 104. It measures two meters north to south by two meters east to west. Artifacts observed within Locus 105 include: 21 basalt flakes (13 primary and eight secondary), 14 metavolcanic flakes (eight primary and six secondary), one basalt bi-directional core with six extraction scars and one black metavolcanic bi-directional core with four extraction scars.

Locus 106 is located out of the APE and is approximately 63 meters northwest of Locus 105. It measures three meters north to south by three meters east to west. Artifacts observed within Locus 106 include 20 metavolcanic flakes (16 primary and four secondary) and one green metavolcanic multi-directional core with four extraction scars.

Locus 107 is located out of the APE and is approximately 64 meters southeast of Locus 106. It measures two meters north to south by two meters east to west. Artifacts observed within Locus 107 include eight metavolcanic primary flakes and one green metavolcanic bi-directional core with three extraction scars.

Locus 108 is located out of the APE and is approximately six meters southeast of Locus 107. It measures two meters north to south by two meters east to west. Artifacts observed within Locus 108 include eight green metavolcanic primary flakes and one quartzite pebble with pressure flaking on one of its sides.

Locus 109 is located out of the APE and is approximately 42 meters east-southeast of Locus 108. It measures three meters north to south by four meters east to west. Artifacts observed within Locus 109 include: 30 metavolcanic flakes (six primary and 24 secondary), two black metavolcanic tested cobbles, one black metavolcanic uni-directional core with three extraction scars and one black metavolcanic multi-directional core with seven extraction scars.

Locus 110 is located out of the APE and is approximately 32 meters northeast of Locus 109. It measures three meters north to south by three meters east to west. Artifacts observed within Locus 110 include: 30 metavolcanic flakes (15 primary, 14 secondary and one shatter), three cryptocrystalline silicate flakes (two primary and one secondary), one cryptocrystalline silicate tested cobble, one metavolcanic tested cobble and two green metavolcanic multi-directional cores with three extraction scars.

Locus 111 is located out of the APE and is approximately eight meters north of Locus 110. It measures two meters north to south by three meters east to west. Artifacts observed within Locus 111 include 20 white quartz flakes (six primary and 14 secondary) and three brown cryptocrystalline silicate primary flakes.

Locus 112 is located out of the APE and is approximately 37 meters northeast of Locus 111. It measures five meters north to south by five meters east to west. Artifacts observed within Locus 112 include: six cryptocrystalline silicate flakes (three primary and three secondary), 36 metavolcanic flakes (18 primary and 18 secondary), eight quartz flakes (four primary and four secondary), one cryptocrystalline silicate multi-directional core fragment with five extraction scars and one metavolcanic multi-directional core with three extraction scars.

Locus 113 is located out of the APE and is approximately 29 meters southwest of Locus 112. It measures two meters north to south by two meters east to west. Artifacts observed within Locus 113 include 10 metavolcanic flakes (eight primary and two secondary).

Locus 114 is located out of the APE and is approximately 15 meters southeast of Locus 113. It measures one meter north to south by one meter east to west. Artifacts observed within Locus 114 include six black metavolcanic flakes (two primary and four secondary).

Locus 115 is located out of the APE and is approximately 97 meters south-southwest of Locus 114. It measures two meters north to south by two meters east to west. Artifacts observed within Locus 115 include: 30 metavolcanic flakes (12 primary and 18 secondary), one metavolcanic uni-directional core with three extraction scars and one black metavolcanic multi-directional core with 6 extraction scars.

Locus 116 is located out of the APE and is approximately 106 meters south of Locus 115. It measures five meters north to south by four meters east to west. Artifacts observed within Locus 116 include 19 black metavolcanic flakes (nine primary and 10 secondary).

Locus 117 is located out of the APE and is approximately 45 meters southwest of Locus 116. It measures two meters north to south by two meters east to west. Artifacts observed within Locus 117 include 24 petrified wood flakes (12 primary and 12 secondary), and one petrified wood multi-directional core with three extraction scars.

Locus 118 is located out of the APE and is approximately 82 meters north-northeast of Locus 117. It measures one meter north to south by two meters east to west. Artifacts observed within Locus 118 include: 10 metavolcanic flakes (five primary and five secondary), one metavolcanic tested cobble that refits with a primary flake and one black metavolcanic multi-directional core with four extraction scars.

Locus 119 is located out of the APE and is approximately 10 meters northwest of Locus 118. It measures three meters north to south by four meters east to west. Artifacts observed within Locus 119 include: 20 metavolcanic flakes (10 primary and 10 secondary), three basalt primary flakes and two metavolcanic uni-directional cores with three extraction scars.

Locus 120 is located out of the APE and is approximately 102 meters south of Locus 119. It measures two meters north to south by three meters east to west. Artifacts observed within Locus 120 include: 25 metavolcanic flakes (13 primary and 12 secondary), one green metavolcanic tested cobble, one black metavolcanic uni-directional core with three extraction scars and one green metavolcanic multi-directional core with 6 extraction scars.

Locus 121 is located out of the APE and is approximately 15 meters north-northwest from Locus 120. It measures two meters north to south by three meters east to west. Artifacts observed within Locus 120 include 20 black metavolcanic flakes (10 primary and 10 secondary).

Locus 122 is located out of the APE and is approximately 10 meters east of Locus 121. It measures two meters north to south by one meter east to west. Artifacts observed within Locus 122 include: 15 metavolcanic flakes (eight primary and seven secondary), one black metavolcanic tested cobble and one black metavolcanic uni-directional core with 3 extraction scars.

Locus 123 is located out of the APE and is approximately 44 meters north-northeast of Locus 122. It measures six meters north to south by six meters east to west. Artifacts observed within Locus 123 include 20 brown cryptocrystalline silicate flakes (11 primary and nine secondary) and four metavolcanic flakes (two primary and two secondary).

Locus 124 is located within the APE and is approximately 1,238 meters north-northwest of locus 123. It measures eight meters north to south by 18 meters east to west. With artifact density more than five artifacts per square meter, a two by two meter sample unit of the overall artifacts was taken and recorded. Artifacts observed within the sample unit include: two Colorado buff ware sherds, 94 Tizon brownware sherds, one brownware flattened lip rim, one brownware rim/neck sherd), 26 metavolcanic flakes (four primary, 20 tertiary and two shatter), two basalt tertiary flakes, one quartzite shatter, one metavolcanic uni-directional core, two green metavolcanic multi-directional cores, one quartzite tested cobble, one green metavolcanic hinge fractured edge modified flake, one quartzite uni-directional edge modified flake fragment, one basalt bi-directional core, one quartzite preform, one cryptocrystalline silicate edge modified flake/perform and one green/gray cryptocrystalline silicate biface preform.

Locus 125 is located within the APE and is approximately four meters northwest of Locus 124. It measures nine meters north to south by three meters east to west. Artifacts observed within Locus 125 include: 19 Tizon brownware body sherds, one Tizon brownware jar rim, one Colorado buffware body sherd, 10 green metavolcanic flakes (three primary, six tertiary and one shatter), one agate secondary flake, one white cryptocrystalline primary flake, two quartzite primary flakes, one red cryptocrystalline primary flake, one green metavolcanic bi-directional core fragment, one green metavolcanic edge modified flake and one weathered faunal long bone fragment.

Locus 126 is located within the APE and is approximately 55 meters southwest of Locus 125. It measures 80 meters east to west by 10 meters north to south. Artifacts observed within Locus 126 include: 181 brownware body sherds, seven brownware rim fragments (four flattened and three recurved), 76 green metavolcanic flakes (16 primary, six secondary, 42 tertiary and 12 shatter), 10 quartzite flakes (three secondary, four tertiary and three shatter), seven quartz tertiary flakes, 14 cryptocrystalline silicate flakes (four secondary, nine tertiary and one shatter), one petrified wood secondary flake, seven basalt flakes (three primary, two secondary and two shatter), two chalcedony secondary flakes, one wonderstone secondary flake, one metavolcanic core fragment, one metavolcanic core, one yellow/orange cryptocrystalline silicate unifacial edge modified flake, one cryptocrystalline silicate biface, one quartzite multi-directional core, one green metavolcanic spent core and one green metavolcanic multi-directional core.

The further character of artifacts found within EBR-019 is unreported.

The general physical context for EBR-019, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. Large fan aprons dominate the central portion of the Project area, where EBR-019 is located, and enter the basin floor up to three kilometers from the Lake Cahuilla high shoreline, and extend up to, and in some places, past that line. The surface consists of finer grain material eroded from the fan piedmont that has formed a number of fan “aprons” which do not individually fully cover the entire area, and which interfinger and partially bury one another and piedmont remnants. Intact desert pavement exists throughout much of the site, and consists of small to large, sub-rounded to sub-angular metavolcanic, basalt, quartz, quartzite and granite gravels and cobbles overlaying coarse sands and fine gravels. The lack of soil development within the capped alluvial unit, and the similar degree of pavement development between the two units suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time; thus, reducing the potential for extensive buried archaeology on that surface. Nonetheless, this area demonstrates the potential for (shallowly) buried preserved surfaces. As a result, there is a low to moderate, and in some places, high likelihood for subsurface deposition that has been buried by geomorphic processes.

Portions of the site to the north-northwest, south and southwest margins, and western side of this site interface with very old slightly raised fan surfaces. In addition, the southern and southwestern margins of the site border on possible fan piedmont remnant surfaces. The ground surface along these margins consists of intact desert pavement that is moderately to well developed, with larger, poorly sorted clasts (i.e. much higher frequency of sub-angular cobbles and medium to large gravels). These older remnant surfaces are frequently truncated by later Holocene inset fan aprons and active gullies or washes.

However, the more terminal northwestern, northeastern, southwestern and southeastern portions of EBR-019 are within the APE, while the vast majority of EBR-019 is not within the APE. This area is situated within or adjacent to the sub-landform interface between the lake basin, fan apron and beach zone, which correlates to the proposed Lake Cahuilla maximum 12 meter-high shoreline or ancient beach zone. These landforms indicate a Late Pleistocene/Early Holocene period of formation. The lake basin geomorphic landform consists of two distinct components: the lower lake basin and the beach zone or interface between the lake basin and the fan apron. The surface of the lower lake basin is generally very flat to very gently sloping, with a thin mantle of Late Holocene alluvium and eolian silts overlaying silts and clays. Because older surfaces have been overlain with a thin layer of more recent materials that were deposited after human occupation began in the area, there is a moderate to high likelihood for subsurface deposition within the lower-lying lake basin portion. Because episodes of filling and emptying of Lake Cahuilla that have occurred at various times in prehistory would have moved and disturbed soils at or near the surface of the lake basin landform, archaeological features preserved there will likely be disturbed or fragmentary. Soils within the lower lake basin are made up of thick deposits of gray fine sand and silt that may be a combination of Colorado River supplied lake sediments and fines flushed into the lake by streams and washes that once terminated nearby at the shoreline. The land surface of the beach zone is undulating and consists of beach flats, sand berms, and deflated beach sands that are consistent with the multiple formation and recessional events of the maximum Lake Cahuilla shoreline. Because the advance and recession of the waters of Lake Cahuilla at various times in prehistory would have moved surface soils within the beach zone, the potential for subsurface deposition is heightened. The soils within the beach zone consist of sands that are non-cohesive and vary from coarse sub-angular to rounded sand and small gravels to medium and coarse well rounded sands overlaid by fine silts and clays.

Temporally diagnostic artifacts indicate that EBR-019 was primarily inhabited during the Late Prehistoric period, likely sometime after AD 1100. Copious numbers of ceramic sherds commonly attributed to the Late Prehistoric period were identified, as well as Cottonwood and Desert Side-notched Series projectile points, which began to appear in this area around AD 1100. Though no temporally diagnostic artifacts were present that date to earlier periods due to the paucity of diagnostic artifacts it cannot be ruled out that EBR-019 could have been occupied during earlier times, such as the Archaic period.

Further analysis of the geographic location of this site reveals that it is located above and close to the high water line of the maximal potential filling of prehistoric Lake Cahuilla. Four events of maximal filling of Lake Cahuilla occurred between A.D. 700 and AD 1540 (Cleland et al. 2000). The first of these episodes began about AD 700 and the lake was fully desiccated again by AD 940. The date of the second occurrence was sometime between AD 940 and AD 1210, and the third happened between AD 1210 and AD 1430. Therefore, it is likely that EBR-019 was occupied sometime between AD 1210 and AD 1430, a time after the advent of Desert Side-notched Series and Cottonwood Series points and during a high lake stand. It also seems likely that people from surrounding regions were drawn to EBR-019 because of the site’s proximity to lacustrine and wetlands resources.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the Applicant interpret sites such as EBR-019 with rich assemblages containing ceramics in association with hearth features and artifacts, such as groundstone and lithic tools, as representing subsistence procurement and processing activities.

Based on temporally diagnostic materials found on the surface of EBR-019, there is no indication that it was occupied other than during the Late Prehistoric period; however, EBR-019 has considerable evidence of intensive and/or repeated habitation. A total of 52 hearths and scatters of fire-affected rock were identified. Of those, 30.8% have associated ceramic sherds (n=16) and 28.8% have associated lithic materials (n=15). In addition, various faunal remains were found including fish and land mammal.

Furthermore, the presence of human cremations/calcined bone suggests a long period of inhabitation and use of the area. One locus contained a total of three confirmed individual human cremations, and 13 additional loci were identified to contain potential, unconfirmed human cremations, all of which appear to have the potential for subsurface deposition. This evidence supports the hypothesis that EBR-019 was intensively inhabited episodically and/or for long periods of time, during which time, various subsistence and material resources associated with Lake Cahuilla and the surrounding area, were exploited. More significantly, the duration of occupation and/or use of this area allowed for ritual/religious practices of the deceased to be employed.

Several loci were interpreted to be expedient tool technology localities (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature with debitage, cores, angular waste/shatter and hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this prehistoric site are of the same primary stone materials (metavolcanic, basalt, petrified wood, quartzite, quartz, cryptocrystalline silicate and wonderstone) that are constituents of the surrounding area, and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent numerous stone tool reduction and manufacturing localities.

The presence of flaked stone tools within EBR-019 represent additional evidence of resource procurement and/or processing of faunal or floral resources. Other evidence can be seen in utilized flakes found within EBR-019, which show evidence of edge wear consistent with their use as an expedient cutting and/or scraping tool. The creation of flaked stone tools requires additional lithic technologies, including bifacial thinning and pressure flaking, to shape and refine cutting edges. Additionally, some of the flaked stone tools are associated both with human cremations/calcined bone and faunal bone, which may be evidence that some of the flaked stone assemblage represent grave goods and may have been considered prestige items. However, other evidence of rarity among the flaked stone tool assemblage, such as tools created from uniquely extralocal materials, was not found on the surface at EBR-019.

A large assemblage of ceramic sherds were identified at EBR-019. At least some of these sherds have potentially diagnostic surface treatments, incising, temper and/or are rim pieces. Data from such artifacts can yield information about ceramic production techniques in use at the time or can help determine the ethnic origin of the vessels they came from. Currently, the primary ethnic groups known to have occupied the region surrounding EBR-019 include the Diegueño and Kamia. Other groups known to have used/traveled/inhabited the area include the Tipai, Cocopa, Kumeyaay, Ipai, Quechan, Paipai and Cahuilla (Luomala 1978; Schaefer and Laylander 2007; URS 2009). In approximately AD 1200, the course of the Colorado River changed, refilling Lake Cahuilla and providing a stable water source that drew people from surrounding regions to repopulate the Colorado Desert. Ceramic wares which were introduced centuries before in other areas were brought into this region at that time (URS 2009). However, it has been argued that stable populations around the lake developed their own distinctive pottery formulas that became regional expressions of their families and locales (May ND). Although these groups each had specific approaches to the creation of ceramics, ceramic vessels were also traded along with subsistence resources and other items infusing some uncertainty into the use of data from ceramics to associate one particular area with a particular tribal group or family (May ND). Therefore, it is unlikely that surface data could directly relate EBR-019 or the area surrounding it to a particular tribe.

Data gathered on ceramics in the area surrounding EBR-019 show evidence of a variety of ceramic types and techniques. Though paddle-and-anvil construction techniques were common among groups using this area, the tempers employed, vessel types manufactured and decoration did vary between groups. The Diegueño used ground clay and did not add temper when manufacturing ceramics. They created a variety of vessels including ollas, bowls, cooking pots and pipes (Rogers 1973:18, URS 2009). The Kamia sometimes added rose quartz as temper and produced the greatest variety of ceramics among the Yuman bands including ollas, jars, canteens, bowls, rattles, plates, scoops, cups and parchers. Kamia ceramics were painted after firing with red and/or black designs (Gifford 1931, Rogers 1973, URS 2009, Van Camp 1979:57). The Cocopah used ground and winnowed clay tempered with ground sherds to create a variety of vessels used for storage and cooking (Alvarez de Williams 1983:99, URS 2009). Quechan vessel types include bowls, parchers, cooking pots, small figurines and large storage vessels that were used to float goods across rivers (Bee 1983:10, McGuire 1982, URS 2009).

The analysis necessary to collect all possible data from ceramics generally takes place in the laboratory, and therefore, is beyond the scope of surface survey. However, it can be generally said that the presence of amount and diversity of ceramic artifacts at EBR-019 is further evidence that subsistence resources were processed and would be consistent with intensive and/or episodic occupation possibly taking place over a long period of time. Additionally, all of the cremations identified at EBR-019 have associated ceramic sherds, which may be indicative of the offering of ceramic vessels as grave goods and/or their use to hold grave goods or for some other purpose connected with the cremation ritual.

Furthermore, archaeologists for the Applicant interpret that ground stone tools present at EBR-019 are further evidence of resource processing. Ground stone tools were made by grinding, abrading, pecking, pounding and polishing rather than chipping and flaking. Groundstone tools found in the area surrounding EBR-019 include manos, metates (sometimes referred to as milling stones) and pestles. Metates in this area are typically flat slabs; manos were smaller, soap and loaf-shaped stones were moved in a circular motion against the metate in order to grind small seeds and other food resources; pestles were elongated, club-shaped stones used for pounding and grinding in mortar. Manos, metates, and pestles were primarily constructed from coarse-grained stone such as sandstone or granite. Mortars in desert environments absent of large coarse bedrock outcrops were often made from cottonwood trees. Manos, metates, and pestles are associated with subsistence procurement and/or processing (Chartkoff and Chartkoff 1984). Such groundstone tools are associated to human and faunal bone in Locus 65, and therefore could feasibly be grave goods.

A large number of the features at EBR-019 were identified as hearths. The presence of a hearth feature or fire-affected rock is evidence of resource processing and/or other activities. Hearth features found in association with lithic debitage could be evidence of more complex lithic resource processing activities. Lithic materials intended for flaked tool production were sometimes heat treated using open hearths in order to improve the flaking characteristics of the stone. Additionally, open hearths were used in prehistory for various other purposes such as parching seeds and grains, cooking, and to provide personal warmth. Such features may also represent sacred/ritualistic activities associated with cremating the deceased and/or animals.

Extralocal materials observed within EBR-019 include Olivella shell beads, marine shell beads/pendants, shell fragments and wonderstone. Although additional testing/data is needed to determine their significance; artifacts such as these reflect direct procurement by the desert inhabitants through nomadic movements to the western and southern coastal areas or indirect procurement through exchange with other groups inhabiting the Colorado/Yuha Desert; thus indicating links with areas within and beyond the region (Schaefer and Laylander 2007).

Based on the presence of temporally diagnostic artifacts, EBR-019 can be associated with a period of time late in prehistory, when people of the Yuha desert were drawn to resources available due to episodic filling of ancient Lake Cahuilla. Data that might be gathered through further study of archaeological deposits present at EBR-019 could greatly expand our knowledge of this unique phenomenon and how desert peoples adapted to such a rapidly changing environment.

Much of EBR-019 lies on relatively stable ground surfaces and it is virtually certain that it contains buried and potentially intact archaeological resources. Loci 27, for example is adjacent to a road where subsurface deposits are visible in the road cut. Likewise, potential roasting pits were identified at Locus 20. All areas with cremations identified at EBR-019 almost certainly have subsurface cultural deposits. Therefore, it can be assumed that EBR-019 has significant additional data potential.

Additionally, EBR-019 has characteristics that qualify it as a contributing resource of the proposed Lake Cahuilla High Water Line Archaeological District.

As a result, this site, as a stand-alone or individual resource and as a contributor to a proposed district, is recommended eligible for the National Register, and is a historic property pursuant to the National Register, and a historical resource per the California Register under the criteria for eligibility. In addition, EBR-019 is considered a contributor to the proposed Lake Cahuilla High Water Line Archaeological District.

EBR-070

EBR-070 is an oblong-shaped prehistoric lithic reduction site that covers a total surface of 257 square meters. The site is located within the southern portion of the 450 MW area of the Proposed IVS Project. The surface area of the site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of intact moderately developed desert pavement, with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote, burroweed and bunch grass.

This site measures 63 meters from east to west by six meters north to south, and contains a total of 79 prehistoric artifacts. It consists of two concentrations of lithic artifacts interpreted to be single reduction loci. The prevailing cultural constituents within this site consist of prehistoric lithic reduction debitage. Artifact density at EBR-070 is low, with a calculated distribution of one artifact per 3.2 square meters. The overall condition of the site is good with no visible alterations.

This site contains two loci and a total of 79 artifacts (76 associated with loci), which include: 72 green metavolcanic flakes (seven primary, 13 secondary, 51 tertiary and one shatter), two granitic hammerstones, one quartzite hammerstone, one unifacial metavolcanic core, one multidirectional metavolcanic core, one bifacial metavolcanic core tool and one unifacial metavolcanic core tool.

Locus 1 is located at the center of the site and measures 1.5 meters north to south by two meters east to west. Artifacts observed within Locus 1 include: 64 green metavolcanic flakes (five primary, eight secondary, 50 tertiary and one shatter), one unifacial green metavolcanic core, one multidirectional metavolcanic core, one bifacial metavolcanic core tool, one unidirectional metavolcanic core tool and one quartzite hammerstone.

Locus 2 located 3.7 meters west of Locus 1 and measures one meter north to south by one meter east to west. Artifacts observed within Locus 2 include: six metavolcanic flakes (two primary, three secondary and one tertiary,) and one granite hammerstone.

Those artifacts observed within 30 meters and outside of the loci consist of one granitic hammerstone and two heavily patinated metavolcanic secondary flakes. The further character of artifacts found within EBR-70 is unreported.

The more particular physical context for EBR-070, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for Early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007); therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists primarily of secondary and tertiary flakes, uni-directional, bi-directional, and multi-directional cores, angular waste/shatter and three hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same three primary stone (metavolcanic, quartzite, granitic) materials that is a constituent of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent two single reduction localities or episodes. It should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. EBR-070 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits; therefore, data potential is considered exhausted through recordation of EBR-070.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, EBR-070 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

EBR-072

EBR-072 is a circular shaped prehistoric site lithic scatter that covers a total surface area of seven square meters. The site is located within the south, central portion of the 450 MW area of the Proposed IVS Project. The site is situated atop a very old fan surface that is covered by intact desert pavement within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The desert pavement is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposing metavolcanic and granitic gravels and cobbles. Vegetation species observed on the site include: creosote, burrowbush, bunch grass and desert trumpet.

This lithic scatter site measures two meters north to south by three meters east to west, and contains a total of five prehistoric artifacts. The prevailing cultural constituents within this site consist of lithic reduction debitage. Artifact density at EBR-072 is low, with a calculated distribution of one artifact per 1.32 square meters. The overall condition of the site is good with minor alterations by a two track off-highway vehicle

(OHV) road running in an east-west direction located approximately seven meters to the north of the site.

This prehistoric lithic scatter consists of five caramel-colored cryptocrystalline silicate chert flakes (one primary flake and four secondary flakes). Four flakes are located along the western boundary and one flake is located in the south east corner of the site. The further character of artifacts within EBR-072 is unreported.

The more particular physical context for EBR-072, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for Early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, with debitage consisting of primary and secondary flakes. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone material (cryptocrystalline silicate) that is a constituent of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent a single reduction locality or episode. It should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. EBR-072 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area there is very low likelihood for subsurface archaeological deposits; therefore, data potential is considered exhausted through recordation of EBR-072.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National

Register or a historical resource per the California Register under any of the criteria. In addition, EBR-072 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

EBR-079

EBR-079 is an amorphous-shaped prehistoric lithic scatter and rock feature site that covers a total surface area of 318 square meters. The site is located within the south central portion of the 450 MW area of the Proposed IVS Project. The site is situated atop a very old elevated fan surface covered by intact desert pavement within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The desert pavement is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands composed of decomposing metavolcanic and granitic gravels and cobbles. Vegetation species on the site include: creosote, burroweed, desert trumpet and bunch grass.

This lithic scatter and rock cluster site measures 77 meters north to south by 33 meters east to west and contains a total of 88 prehistoric artifacts. The prevailing cultural constituents within this site consist of prehistoric lithic reduction artifacts. Artifact density at EBR-079 is low, with a calculated distribution of one artifact per 3.61 square meters. The overall condition of the site is good, with some alterations caused by off-highway vehicles in the northern portion of the site location.

This site contains three concentrations interpreted by the archaeologist to be two lithic reduction loci and one quartz smash loci with three additional artifacts observed outside these loci. A total of 88 artifacts were recorded within the site boundary, which include: one quartzite hammerstone, one brown multi-directional core, one green metavolcanic multi-directional core, one green metavolcanic bi-facial core tool, 21 green metavolcanic flakes (seven primary, seven secondary, seven tertiary), 30 dark brown chert flakes (five primary 14 secondary, 10 tertiary, one shatter), approximately 30 pieces of quartz angular waste/shatter, two carmel chert secondary flakes and one metavolcanic hammerstone.

Feature 1 is located near the northern portion of the site boundary. Feature 1 measures one meter north to south by one meter east to west by 16 centimeters in height. The feature is constructed of 36 small to large sub-round to sub-angular granite metavolcanic and quartzite cobbles and is one course high. The rock cluster feature appears to be loosely stacked, lacks extensive sediment accumulation and appears to be partially imbedded/deflated. No artifacts were found associated with Feature 1.

Locus 1 is located in the central portion of the site and measures two meters north to south by one meter east to west. Artifacts observed within Locus 1 include: 21 green metavolcanic flakes (seven primary, seven secondary, seven tertiary) with one green metavolcanic bifacial core tool chopper, and one green metavolcanic multi-directional core.

Locus 2 is 25 meters southeast of Locus 1 and measures one meter north to south by three meters east to west. Artifacts observed within Locus 2 include: 30 dark brown chert flakes (five primary, 14 secondary, 10 tertiary, one piece of angular waste/shatter) and one multi-directional core.

Locus 3 is 44 meters northwest of Locus 2 and measures six meters north to south by five meters east to west. Artifacts observed within Locus 3 include approximately 30 pieces of quartz shatter and one quartzite hammerstone.

The further character of artifacts associated with Loci 1 through 3 is unreported.

One green metavolcanic hammerstone and two carmel-colored chert secondary flakes were observed within 30 meters of the identified loci.

The more particular physical context for EBR-079, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for Early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007) with a rock cluster feature of unknown age and/or function. The predominant cultural constituents of this site are lithic reduction in nature, debitage consists primarily secondary and tertiary flakes, cores, angular waste/shatter, and hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic reduction debitage are of three primary stone materials (metavolcanic, quartz, and chert) that are constituents of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least three single reduction localities/episodes. It should not be discounted that artifacts within this site may have been collected and/or used at a later point in time. Feature 1 is interpreted as a deflated prehistoric cairn or possible modern feature. Due to the frequent off-highway vehicle (OHV) traffic in this area, such rock clusters are often used to demarcate OHV trails, and as a result, the age and function of this feature cannot be determined.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. EBR-079 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform (URS 2009). This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area there is very low likelihood for subsurface archaeological deposits; therefore, data potential is considered exhausted through recordation of EBR-079.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, EBR-079 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

EBR-080

EBR-080 is an oblong-shaped lithic scatter that covers a total surface of 11.6 square meters. The site is located within the southern portion of the 450 MW area of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles. Vegetation is sparse, consisting of ocotillo, burroweed, bunch grass and desert trumpet, primarily located in adjacent gullies to the east and south.

This lithic scatter site measures four meters north to south by four meters east to west, and contains a total of three prehistoric artifacts. The prevailing cultural constituents within this site consist of prehistoric artifacts. Artifact density at EBR-080 is low, with a calculated distribution of one artifact per 3.9 square meters. The overall condition of the site is good.

This site consists of three artifacts which include one fine grain green metavolcanic multi-directional core located in the northeast corner of the site boundary and two green metavolcanic flakes (one primary and one secondary) located in the southeastern portion of the site (see attached artifact record for details). The further character of artifacts found within EBR-080 is unreported.

The more particular physical context for EBR-080, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007); therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

This site represents an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, and debitage consists of primary and secondary flakes and a single multidirectional core. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone (metavolcanic) material that is a constituent of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent a single reduction locality or episode, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. EBR-080 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area there is very low likelihood for subsurface archaeological deposits, therefore data potential is considered exhausted through recordation of EBR-080.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, EBR-080 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

EBR-092

EBR-092 is an oblong-shaped historic site that covers a total surface of 567 square meters. The site is located within southern portion of the 450 MW area of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote, burrowbush/burroweed, bunch grass, and desert trumpet. Vegetation is sparse and primarily located within the surrounding gullies to the south and east.

This historic refuse scatter and historic/modern rock cluster site measures 68 meters northwest to southeast by 17 meters northeast to southwest and contains a total of 34 historic artifacts. The prevailing cultural constituents within this site consist of two concentrations with 28 artifacts that are interpreted to be glass bottle fragment scatter loci, plus six additional historic artifacts observed outside the loci. Also present within the site are two rock cluster features. Artifact density at EBR-092 is low, with a calculated distribution of one artifact per 16.7 square meters. The overall condition of the site is good with minor disturbances by the historic road (HR-02) and two off-road vehicle two-track trails that run through the site in east to west and north to south directions.

The site contains two historic/modern rock cluster features, two broken glass loci and 34 artifacts, which include: 11 aqua hand blown bottle fragments, 17 hand blown amethyst bottle fragments, two hole-and-cap cans, one lap seam can, one can bottom lid, one bolt, and one square cut nail/spike.

Feature 1 is located at the southern boundary of the site and consists of a historic/modern rock cluster that measures 28 inches north to south by 28 inches east to west. It contains 29 sub-rounded metavolcanic, granite and quartzite cobbles stacked in two courses to a height of eight inches.

Feature 2 is located 64 meters northwest of Feature 1 and consists of a historic/modern rock cluster that measures 32 inches north to south by 26 inches east to west. It contains 23 sub-rounded basalt, granite and metavolcanic cobbles stacked in two courses to a height of seven inches.

Locus 1 is located at the south central portion of the site and measures one meter east to west by one meter north to south. Artifacts observed within Locus 1 include 11 fragments of a hand blown aqua prescription bottle which consist of a bottle neck, square base and "BLE" and "LLER" marked on both sides of bottle.

Locus 2 is located 13 meters north of Locus 1 and measures two meters north to south by one meters east to west. Artifacts observed within Locus 2 include 17 fragments of manganese decolorized (amethyst) glass.

Those artifacts observed within 30 meters and outside of the loci and features consist of two hole-and-cap cans, one lap seam can, one can bottom lid, one bolt and one square cut nail/spike. The further character of artifacts found within EBR-092 is unreported.

The more particular physical context for EBR-092, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the

Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret that although the rock cluster present at EBR-092 has characteristics similar to survey markers in the area, it cannot be conclusively identified as such. The size of the cluster and of the stones that comprise it conforms approximately to those surrounding General Land Office survey benchmarks found in the surrounding region, however the feature is not located on a current section or quarter section corner point.

Additionally, expediently constructed stone clusters can also be markers of mining claims or homestead boundaries. Mining claim markers sometimes contain tobacco tins to hold copies of official records substantiating the claim. Such a tin was not evident at this stone cluster.

No temporally diagnostic historic artifacts were found associated with the rock clusters and it seems unlikely that the feature contains cultural materials, given the structure of the rock cluster (size-sorted stones that have become tightly packed and evidence of sand accumulation/deposition amongst stones). Therefore, it is noteworthy that this stone cluster cannot be definitively determined to be either historic or prehistoric in age. The site is situated within a large recreational area which is frequently used by off-highway vehicles. It is possible that the stone cluster is modern in age and perhaps was expediently placed to provide a visible landmark to facilitate navigation.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret that deposits of historic artifacts such as the ones found at EBR-092 typically represent episodes of refuse disposal after initial discard in another location (dumping) or discard and/or loss of individual articles in situ. In the case of EBR-092, the small number of artifacts and artifact types present would more likely have resulted from in-situ disposal rather than dumping of a wide range of artifact types that would be expected in an assemblage of common household refuse. Though dates of manufacture can be determined for some of the artifacts present at EBR-092, the time between the initial use/consumption of the artifacts and their ultimate disposal cannot be known so the specific date of their disposal cannot be reliably determined.

Artifacts for which general dates of manufacture could be determined include: a patent medicine bottle with embossed lettering on the side panels that dates to sometime between 1867 and 1906 (when the passage of the Pure Food and Drug Act stopped their production) manganese decolorized glass (also known as sun colored amethyst glass, which was produced between 1880 and 1920 when manganese was added to glass to turn it from its natural aqua color to clear, but eventually reacts with sunlight to turn the glass a light shade of purple); and two hole-in-cap cans which were generally manufactured between 1840 and 1920 but persisted being manufactured in small numbers into the 1950s (Goodman 2002). Also present is a single square cut nail. The particular example at this site is larger than most nails (5.75 inches in length) such that it might accurately be described as a small spike. Square cut nails were common until the 1880s when round nails began being machine produced from wire stock (Goodman 2002). The unusual size of this nail may have required that it be hand-forged at a later time when smaller wire nails were available, so this example alone cannot be considered to be temporally diagnostic.

Based on the date ranges associated with the artifacts listed, the deposition episode at EBR-092 would have likely been the late 19th or early 20th century but may have been as late as the 1950s.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, EBR-092 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

EBR-095

EBR-095 is an oblong-shaped lithic scatter that covers a total surface area of 488.52 square meters. The site is located within the north central portion of the 450 MW area of the Proposed Solar 2 Project, on the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation (URS 2009). The surface area of the site consists of flat, open intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles overlaying coarse sands and fine gravels. Vegetation species on the site include creosote, cholla, bunch grass and ocotillo. Prehistoric trail T-003 runs east to west through northern half of site.

This lithic scatter measures 47 meters north to south by 16 meters east to west and contains a total of 51 prehistoric artifacts. It consists of concentrations interpreted to be three single reduction loci with 50 artifacts and one additional artifact located between the loci. The prevailing cultural constituents within this site consist of prehistoric lithic reduction debitage. Artifact density at EBR-095 is low, with a calculated distribution of one artifact per 9.77 square meters. The overall condition of the site is fair to good, with some alterations caused by off-road vehicle activity as is evidenced by the presence of two parallel off-road vehicle tracks that cut through the northern portion of the site. Also, recent alluvial sheetwash has impacted northern portions where it nearly overlies some artifacts within Locus 3.

The artifact types and materials present at this site include: 17 metavolcanic flakes (seven primary, eight secondary and two tertiary), four metavolcanic shatter, 17 quartz flakes (six primary, three secondary and eight tertiary), six quartz shatter, two metavolcanic cores (one uni-directional and one bi-directional), one quartz bi-directional core, one metavolcanic edge modified flake and three metavolcanic tested cobbles.

Locus 1 is located within the southwestern portion of the site and measures three meters north to south by two meters east to west. Artifacts observed within Locus 1 include: 13 green metavolcanic flakes (four primary, seven secondary, and two tertiary), four green metavolcanic shatter, one green metavolcanic bi-directional core, one green metavolcanic edge modified flake and two green metavolcanic tested cobbles.

Locus 2 is located 13 meters southeast of Locus 1 and measures two meters north to south by one meter east to west. Artifacts observed within Locus 2 include: 17 quartz flakes (six primary, three secondary, and eight tertiary), six quartz shatter and one quartz bi-directional core.

Locus 3 is located 44 meters north of Locus 2 and measures 30 centimeters north to south by 30 centimeters east to west. Artifacts observed within Locus 3 include: four green metavolcanic flakes (three primary and one secondary) and one green metavolcanic uni-directional core.

Those artifacts observed within 30 meters and outside of the loci consist of one green metavolcanic tested cobble. The further character of artifacts associated with EBR-095 is unreported.

The more particular physical context for EBR-095, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. Large fan aprons dominate the central portion of the Project area and enter the basin floor up to three kilometers from the Lake Cahuilla high shoreline, and extend up to, and in some places, past that line. The surface consists of finer grain material eroded from the fan piedmont that has formed a number of fan “aprons” which do not individually fully cover the entire area, and which interfinger and partially bury one another and piedmont remnants. The lack of soil development within the capped alluvial unit, and the similar degree of pavement development between the two units, suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time; thus reducing the potential for extensive buried archaeology on that surface. Nonetheless, this area does demonstrate the potential for (shallowly) buried preserved surfaces, but there is a high likelihood these deposits will represent the same constituents recorded on the surface. As a result, there is a very low to moderate likelihood for subsurface deposition. The particular land surface on which this site is situated, however, appears to be a smaller piedmont remnant that is relatively stable; therefore, the likelihood of the presence of subsurface archaeological deposits may be reduced. The landform that the site is situated on appears bound to the west and north by younger inset fan aprons. The fan piedmont remnant landform appears to continue beyond the southern and eastern portions of the site. Ephemeral gullies, somewhat braided but not very incised, immediately binds the site to west and east.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature. Debitage consists predominantly of that which would result from early stage reduction and uni-directional or bi-directional cores. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone (metavolcanic and quartz) material that is a constituent of the site's and surrounding area's lithology, and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent three single reduction localities or episodes; but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time. The presence of flaked stone tools edge modified flake within EBR-095 represents resource procurement and/or processing of faunal or floral resources. In addition, the creation of flaked stone tools requires additional lithic technologies, possibly including bifacial thinning and pressure flaking to shape and refine cutting edges. The metavolcanic edge modified flake appears to be a scraping implement similar to a spokeshave, and as such little energy was expended to modify it in order to increase its effectiveness.

It is possible that cultural constituents of the site may be associated with the prehistoric trail T-03 that runs through the northern portion of the site. EBR-095 is centrally located in a group of three sites and three isolates that seem roughly aligned with the direction of the trail. It seems possible that trail T-03 may have been used prehistorically as a travel route to or through resource procurement areas.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction; and analysis of artifact distribution has been accounted for during the recordation process. The particular location of this site on a remnant portion of the fan piedmont indicates that it is relatively stable and therefore reduces the likelihood of subsurface deposits. Thus, due to the low density of artifacts and low probability for significant subsurface artifacts, the data potential is considered exhausted through recordation of EBR-095.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, EBR-095 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

EBR-096

EBR-096 is a circular-shaped prehistoric lithic scatter that covers a total surface area of 13 square meters. The site is located within the northern central portion of the 450 MW area of the Proposed IVS Project. The site is situated within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation (URS 2009). The surface area of the site is comprised of an open, partially stabilized desert pavement that is weakly developed with well-sorted sub-angular to sub-rounded granitic, metavolcanic, gabbro, gneiss, quartz, and quartzite small gravels. Larger sub-angular to sub-rounded gravels and cobbles do occur but are sparsely distributed across the sub-landform. Soils contain alluvial-borne silts and sands underlain by hard pan. Vegetation species on the site include creosote, bunch grasses, ocotillo, burrowbush, and saltbush.

This lithic scatter site measures four meters north to south by four meters east to west, and contains a total of 35 prehistoric artifacts. It consists of one concentration interpreted to be a single lithic reduction locus, with 35 artifacts. The prevailing cultural constituents within this site consist of prehistoric lithics. Artifact density at EBR-096 is high, with a calculated distribution of one artifact per 0.37 square meters. The overall condition of the site is fair to good due to the displacement of artifacts by natural erosion.

This site is a single lithic reduction locus with a total of 35 green metavolcanic flakes (15 primary, 11 secondary, and nine tertiary). The further character of artifacts found within EBR-096 is unreported.

The more particular physical context for EBR-096, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be on a younger (Late Holocene) alluvial fan within the fan apron/skirt geomorphic landform, which has a Late Pleistocene/Early Holocene period of formation. Large fan aprons dominate the central portion of the Project area and enter the basin floor up to three kilometers from the Lake Cahuilla high shoreline, and extend up to, and in some places, past that line. The surface consists of finer grain material eroded from the fan piedmont that has formed a number of fan "aprons" which do not individually fully cover the entire area, and which interfinger and partially bury one another and piedmont remnants. The lack of soil development within the capped alluvial unit, and the similar degree of pavement development between the two units suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time; thus reducing the potential for extensive buried archaeology on that surface. As a result, there is a very low to moderate likelihood for subsurface deposition, and it is likely that these deposits, if any, will represent the same constituents recorded on the surface. The desert pavement at the site seems partially stabilized but is weakly developed as it is periodically subject to natural erosion via alluvial and aeolian-borne agents. The fan apron sublandform is frequently dissected by very shallow, ephemeral to intermittent gullies.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage dominated by early stage reduction. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary material (metavolcanic) that is a typical constituent of the surrounding area, and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent one single reduction locality or episode; but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction; and analysis of artifact distribution has been accounted for during the recordation process. EBR-096 is located within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. The lack of soil development within the capped alluvial unit suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time, thus reducing the potential for extensive buried archaeological deposits. As a result there is a very low to moderate likelihood for subsurface deposition. The location of the site on a younger fan combined with the presence of recent alluvium on the surface increases that likelihood. Though this area does demonstrate some potential for (shallowly) buried preserved surfaces, there is a high likelihood these deposits will represent the same constituents recorded on the surface. Therefore, due to the lack of unique or temporally diagnostic artifacts and low probability for significant subsurface artifacts, the data potential is considered exhausted through recordation of EBR-096. Additionally, there is evidence that recent erosion at the site has displaced artifacts to some degree; therefore, the integrity of surface distributions may be compromised.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, EBR-096 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

EBR-100

EBR-100 is an oblong-shaped prehistoric lithic scatter that covers a total surface of 28 square meters. The site is located within the north central portion of the 450 MW area of the Proposed IVS Project. The site is situated on a younger fan (Late Holocene formation) within the fan apron/skirt geomorphic landform, which was formed in the Late Pleistocene/Early Holocene (URS 2009). The surface area of the site consists of recent alluvium and disturbed desert pavement that is moderately to poorly developed with small sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Vegetation on the site include creosote, ocotillo and burroweed.

This lithic scatter measures 9.6 meters northeast to southwest by 3.2 meters northwest to southeast, and contains a total of 31 prehistoric artifacts. It consists of two concentrations interpreted to be two single reduction loci with 26 artifacts, and five additional artifacts observed outside the loci. The prevailing cultural constituents within this site consist of prehistoric lithic reduction debitage. Artifact density at EBR-100 is low, with a calculated distribution of one artifact per 1.16 square meters. The overall condition of the site is fair due to off-highway vehicles tracks that cross over the loci.

The site contains two lithic reduction loci and a total of 31 artifacts, which include: 29 metavolcanic flakes (five primary, 17 secondary, one tertiary and six shatter), one metavolcanic hammerstone and one metavolcanic bi-directional core.

Locus 1 is located two meters south of the site datum and measures two meters east to west by two meters north to south. Artifacts observed within Locus 1 include 15 metavolcanic flakes (two primary, 11 secondary and two shatter) and one metavolcanic hammerstone.

Locus 2 is located seven meters northeast from Locus 1 and measures two meters north to south by one meters east to west. Artifacts observed within Locus 2 include nine metavolcanic flakes (one primary, four secondary, one tertiary and three shatter) and one metavolcanic bi-directional core.

Those artifacts observed within 30 meters and outside of the loci consist of five metavolcanic flakes (two primary, two secondary and one shatter). The further character of artifacts associated with EBR-100 is unreported.

The more particular physical context for EBR-100, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. Large fan aprons dominate the central portion of the Project area and enter the basin floor up to 3 kilometers from the Lake Cahuilla high shoreline, and extend up to, and in some places, past that line. The surface consists of finer grain material eroded from the fan piedmont that has formed a number of fan “aprons” which do not individually fully cover the entire area, and which interfinger and partially bury one another and piedmont remnants. The lack of soil development within the capped alluvial unit, and the similar degree of pavement development between the two units, suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time; thus reducing the potential for extensive buried archaeology on that surface. Nonetheless, this area does demonstrate the potential for (shallowly) buried preserved surfaces, but there is a high likelihood these deposits will represent the same constituents recorded on the surface. As a result, there is a very low to moderate likelihood for subsurface deposition. The desert pavement consists of small to large, sub-rounded to sub-angular metavolcanic, basalt, quartz, quartzite and granite gravels and cobbles overlaying coarse sands and fine gravels.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature; debitage consists of primary, secondary and tertiary flakes, one bidirectional core, angular waste/shatter, with one hammerstone. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone (metavolcanic) material that is a constituent of the surrounding area, and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent two single reduction localities or episodes; but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction; and analysis of artifact distribution has been accounted for during the recordation process.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, EBR-100 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

EBR-102

EBR-102 is an amorphous-shaped prehistoric lithic scatter that covers a total surface of 2,198 square meters. The site is located within the central portion of the 450 MW area of the Proposed IVS Project. The site is situated within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation (URS 2009). The surface area of the site consists of an older fan surface mantled by younger fan apron with disturbed desert pavement that is poorly developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Vegetation species on the site include creosote, ocotillo, burroweed, bunch grass and mesquite. The site is bound by ephemeral gullies to the north, west and east.

This lithic scatter site measures 88 meters northeast to southwest by 70 meters northwest to southeast, and contains a total of 97 prehistoric artifacts. It consists of three concentrations interpreted to be one lithic scatter locus and two single reduction loci, with 90 artifacts, and six additional artifacts observed outside the loci. The prevailing cultural constituents within this site consist of prehistoric lithic reduction artifacts. Artifact density at EBR-102 is low, with a calculated distribution of one artifact per 23 square meters. The overall condition of the site is fair due to alterations caused by off-highway vehicle activity and natural erosion.

The artifact types and materials represented at the site include 76 metavolcanic flakes (15 primary, 25 secondary, 17 tertiary and 19 shatter), three metavolcanic tested cobbles, four metavolcanic cores (two uni-directional, one bi-directional and one multi-directional), eight basalt flakes (one primary, four secondary, one tertiary and two shatter), one basalt edge modified flake, two basalt uni-directional cores, one chalcedony multidirectional core and one cryptocrystalline silicate chert tertiary flake.

Additionally, prehistoric trail T-03 lies approximately 12 meters to the south of the site. This site is the easternmost of a group of three isolated artifacts and two other sites that may be associated with trail T-03.

Locus 1 is located in the southwest center of the site and measures 14 meters north to south by five meters east to west. Artifacts observed within Locus 1 include: 15

metavolcanic flakes (three primary, five secondary, four tertiary and three shatter), two metavolcanic cores (one uni-directional and one bi-directional) and one metavolcanic tested cobble.

Locus 2 is located 43 meters east of Locus 1 and measures eight meters north to south by six meters east to west. Artifacts observed within Locus 2 include 34 metavolcanic flakes (six primary, 12 secondary, 13 tertiary and three shatter) and one metavolcanic multidirectional core.

Locus 3 is located 61 meters southwest of Locus 2 and measures nine meters north to south by one meter east to west. Artifacts observed within Locus 3 include 27 metavolcanic flakes (six primary, eight secondary and 13 shatter), one metavolcanic tested cobble, one metavolcanic uni-directional core, seven basalt flakes (one primary, three secondary, one tertiary and two shatter) and one uni-directional core.

Those artifacts observed within 30 meters and outside of the loci consist of six artifacts that include one metavolcanic tested cobble, one uni-directional basalt core, one chalcedony multi-directional core, one basalt edge modified flake, one basalt secondary flake and one cryptocrystalline silicate chert tertiary flake. The further character of artifacts found with EBR-102 is unreported.

The more particular physical context for EBR-102, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. Large fan aprons dominate the central portion of the project area and enter the basin floor up to three kilometers from the Lake Cahuilla high shoreline, and extend up to, and in some places, past that line. The surface consists of finer grain material eroded from the fan piedmont that has formed a number of fan “aprons” which do not individually fully cover the entire area, and which interfinger and partially bury one another and piedmont remnants. The lack of soil development within the capped alluvial unit, and the similar degree of pavement development between the two units suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time; thus reducing the potential for extensive buried archaeology on that surface. The particular location of this site on a younger fan may increase the potential for subsurface deposits. None the less, though this area does demonstrate the potential for (shallowly) buried preserved surfaces, there is a high likelihood these deposits will represent the same constituents recorded on the surface. As a result there is a very low to moderate likelihood for significant subsurface deposition. The desert pavement consists of small to large, sub-rounded to sub-angular metavolcanic, basalt, quartz, quartzite and granite gravels and cobbles overlaying coarse sands and fine gravels.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists primarily of secondary flakes and unidirectional cores. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone material (metavolcanic) that is a constituent of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least three single reduction localities or episodes, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time. The presence of flaked stone tool (a single edge modified flake) within EBR-102 represents resource procurement and/or processing of faunal or floral resources. The creation of flaked stone tools requires additional lithic technologies, possible including bifacial thinning and pressure flaking to shape and refine cutting edges. However, the example present here shows little modification to increase its efficiency, and therefore may still be considered an expedient tool.

Additionally, this site may be associated with trail T-03 that lies approximately 12 meters off its southern boundary. That trail is approximately 438 meters long and runs through a group of three sites and three isolates. Those sites and isolates appear to be roughly aligned in the same direction as the trail, leading to the speculation that the trail may have been used for travel to and from or through areas where resources were collected.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. EBR-102 is located within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. The lack of soil development within the capped alluvial unit suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time, thus reducing the potential for extensive buried archaeological deposits. As a result there is a very low to moderate likelihood for subsurface deposition. None the less, though this area does demonstrate some potential for (shallowly) buried preserved surfaces, there is a high likelihood these deposits will represent the same constituents recorded on the surface. Therefore, due to the low density of artifacts and low probability for significant subsurface artifacts, the data potential is considered exhausted through recordation of EBR-102.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, EBR-102 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

EBR-106

EBR-106 is an oblong prehistoric lithic scatter that covers a total surface area of 6.78 square meters. The site is located within the center portion of the 450 MW area of the Proposed IVS Project. The site is situated within the fan apron/skirt geomorphic landform, which indicates a

Late Pleistocene/Early Holocene period of formation (URS 2009). The surface area of the site consists of an open, elevated, older fan surface covered by intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Vegetation species on the site include creosote and bunchgrass.

This lithic scatter site measures two meters north to south by two meters east to west, and contains a total of eight prehistoric artifacts. Artifact density at EBR-106 is medium, with a calculated distribution of one artifact per 0.85 square meters. The overall condition of the site is fair with natural erosional processes taking place.

Artifacts observed within the site include eight black metavolcanic secondary flakes with a highly weathered sheen. The further character of artifacts within the site is unreported.

The more particular physical context for EBR-106, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. Large fan aprons dominate the central portion of the Project area and enter the basin floor up to 3 kilometers from the Lake Cahuilla high shoreline, and extend up to, and in some places, past that line (URS 2009). The surface consists of finer grain material eroded from the fan piedmont that has formed a number of fan “aprons” which do not individually fully cover the entire area, and which interfinger and partially bury one another and piedmont remnants. The lack of soil development within the capped alluvial unit, and the similar degree of pavement development between the two units, suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time; thus reducing the potential for extensive buried archaeology on that surface (URS 2009). Nonetheless, this area does demonstrate the potential for (shallowly) buried preserved surfaces, but there is a high likelihood these deposits will represent the same constituents recorded on the surface. As a result there is a very low to moderate likelihood for subsurface deposition. The desert pavement consists of small to large, sub-rounded to sub-angular metavolcanic, basalt, quartz, quartzite and granite gravels and cobbles overlaying coarse sands and fine gravels.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, with debitage consisting solely of secondary flakes. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the lithic materials reduced in this lithic scatter are of one stone material (metavolcanic) that is a constituent of the surrounding area; and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent one single reduction locality or episode, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history.

Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction; and analysis of artifact distribution has been accounted for during the recordation process. EBR-106 is located within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. The lack of soil development within the capped alluvial unit suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time, thus reducing the potential for extensive buried archaeological deposits. As a result, there is a very low to moderate likelihood for subsurface deposition. Nonetheless, though this area does demonstrate some potential for (shallowly) buried preserved surfaces, there is a high likelihood these deposits will represent the same constituents recorded on the surface. Due to the low density of artifacts and low probability for significant subsurface artifacts, the data potential for this site is considered exhausted through recordation.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, EBR-106 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

EBR-222

EBR-222 is an amorphous-shaped ceramic/lithic scatter, and fire altered rock (FAR)/ hearth feature, that covers a total surface area of 1033 square meters. The site is located within the eastern portion of the 450 MW area of the Proposed IVS Project. The site is situated within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation (URS 2009). The surface area of the site consists of disturbed moderately stabilized desert pavement with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Vegetation species on the site includes creosote, ocotillo, burroweed and bunch grass.

This ceramic/lithic scatter and FAR feature site measures 39 meters north to south by 48 meters east to west, and contains a total of six prehistoric artifacts. It consists of one FAR feature interpreted to be a deflated hearth with six associated artifacts within 30 meters. The artifacts are scattered along the edges of the site boundary. The areas between the feature and site boundary are void of artifacts. The prevailing cultural constituents within this site consist of prehistoric artifacts. Artifact density at EBR-222 is low, with a calculated distribution of one artifact per 172.17 square meters. The overall condition of the site is fair with some disturbances due to off-highway vehicles.

Six artifacts are observed outside the feature that consist of one weathered petrified wood tested cobble, four buffware ceramic body sherds and one green metavolcanic primary flake. The further character of artifacts associated with EBR-222 is unreported.

Feature 1 is located on the western boundary of the site and measures two meters north to south by two meters east to west. Feature 1 is interpreted to be a deflated hearth, which includes approximately 50 fire altered granitic and metavolcanic cobbles.

The more particular physical context for EBR-222, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. The surface consists of finer grain material eroded from the fan piedmont that has formed a number of fan “aprons” which do not individually fully cover the entire area, and which interfinger and partially bury one another and piedmont remnants. The lack of soil development within the capped alluvial unit, and the similar degree of pavement development between the two units, suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time; thus reducing the potential for extensive buried archaeology on that surface. Nonetheless, this area does demonstrate the potential for (shallowly) buried preserved surfaces, but there is a high likelihood these deposits will represent the same constituents recorded on the surface. As a result there is a very low to moderate likelihood for subsurface deposition.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret that sites such as EBR-222 with richer assemblages containing ceramics and lithics in association with hearth features, to represent subsistence procurement, processing activities, and potentially temporary encampment and/or sacred or ritual activities.

The flaked stone assemblage of this site appears to represent an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature; debitage consists of one metavolcanic secondary flake and one tested petrified wood cobble. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the lithic materials reduced in this lithic scatter are of two materials (metavolcanic and petrified wood) that are constituents of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent a single reduction locality or episode; but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Ceramics such as those represented by the four buffware body sherds present at EBR-222 offer insight into a specific time in prehistory, vessel type, ware, clay origin, and possibly the ethnic group who constructed them. Currently, the primary ethnic groups known to have occupied the region surrounding EBR-222 include the Diegueño and Kamia. Other groups known to have used/traveled/inhabited the area include the Tipai, Cocopa, Kumeyaay, Ipai, Quechan, Paipai and Cahuilla (Luomala 1978; Schaefer and Laylander 2007; URS 2009). In approximately AD 1200, the course of the Colorado River changed, refilling Lake Cahuilla and providing a stable water source, and drawing people from surrounding regions to repopulate the Colorado Desert. Ceramic wares, which were introduced centuries before in other areas, were brought into this region at that time (URS 2009). However, it has been argued that stable populations around the lake developed their own distinctive pottery formulas that became regional expressions of their families and locales (May ND). Although these groups each had specific approaches to the creation of ceramics, ceramic vessels were also traded along with subsistence resources and other items, infusing some uncertainty into the use of data from ceramics to associate one particular area with a particular tribal group or family. Therefore, it is unlikely that surface data could directly relate EBR-222 or the area surrounding it to a particular tribe.

Data gathered on ceramics in the area surrounding EBR-222 show evidence of a variety of ceramic types and techniques. Though paddle-and-anvil construction techniques were common among groups using this area, the tempers employed, vessel types manufactured, and decoration did vary between groups. The Diegueño used ground clay and did not add temper when manufacturing ceramics. They created a variety of vessels, including ollas, bowls, cooking pots, and pipes. The Kamia sometimes added rose quartz as temper and produced the greatest variety of ceramics among the Yuman bands, including ollas, jars, canteens, bowls, rattles, plates, scoops, cups, and parchers. Kamia ceramics were painted after firing with red and/or black designs. The Cocopah used ground and winnowed clay tempered with ground sherds to create a variety of vessels used for storage and cooking. Quechan vessel types include bowls, parchers, cooking pots, small figurines, and large storage vessels that were used to float goods across rivers (URS 2009).

The ceramic assemblage, although minimal in type and quantity, has the potential to provide data relative to research questions regarding use, manufacturing technologies and distribution of ceramics in the prehistoric Lake Cahuilla region.

This site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. Because this site contains artifacts with unique or temporally diagnostic characteristics, the material remains have the potential to be associated with a specific portion of prehistory. EBR-222 is located within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation (URS 2009). As a result there is a very low to moderate likelihood for subsurface deposition. Nonetheless, though this area does demonstrate some potential for (shallowly) buried preserved surfaces, there is a high likelihood these deposits will represent the same constituents recorded on the surface.

Because of the nature of potentially informative and diagnostic characteristics of artifacts found at EBR-222, the recordation of all potential data that might be derived from them requires the work of a ceramics specialist. It is recommended that the ceramics at EBR-222 be studied by such a specialist, so it can be determined if they do provide any additional data potential, and, if so, such data can be recorded.

Due to the presence of temporally diagnostic artifacts (ceramics), further data is necessary to determine if this site, as a stand-alone or individual resource, should be recommended as eligible or not eligible for the National Register, and if it is or is not a historic property pursuant to the National Register or a historical resource per the California Register under the criteria for eligibility. In addition, results of additional data are necessary to determine if EBR-222 is considered a contributor to an existing and/or proposed archaeological district or landscape

JF-005

JF-005 is an amorphous-shaped lithic scatter that covers a total surface area of 193.5 square meters. The site is located within the western portion of the 450 MW area of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of an open, elevated, very old fan surface covered by intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote, burrowbush and bunch grass.

This lithic scatter site measures 18 meters north to south by 21 meters east to west, and contains a total of 74 prehistoric artifacts. It consists of three concentrations interpreted to be three single reduction loci, with 70 artifacts plus four additional artifacts that were observed outside the loci. The prevailing cultural constituents within this site consist of prehistoric artifacts. Artifact density at JF-005 is low, with a calculated distribution of one artifact per 2.61 square meters. The site is bound by two ephemeral gullies to the north and south that flow in a westward direction into a large ephemeral gully running in a north northeast by south southwest direction. The overall condition of the site is good, with minor alterations due to natural erosion.

The site contains three lithic reduction loci and a total of 74 artifacts (70 associated with the loci), which include 36 metavolcanic flakes (four primary, 20 secondary, and 12 tertiary), 33 cryptocrystalline silicate chert flakes (12 primary, 13 secondary, and eight tertiary), two cryptocrystalline silicate chert shatter, one quartz hammerstone, one quartzite hammerstone, and one metavolcanic unidirectional core.

Locus 1 is located at the south center of the site and measures two meters east to west by three meters north to south. Artifacts observed within Locus 1 include: 15 green metavolcanic flakes (three primary, nine secondary, and three tertiary), one green metavolcanic unidirectional core, and one quartz hammerstone.

Locus 2 is located 11 meters northwest from Locus 1 and measures two meters east to west by three meters north to south. Artifacts observed within Locus 2 include 21 green metavolcanic flakes (one primary, 11 secondary, and nine tertiary).

Locus 3 is located 11 meters east from locus 2 and measures seven meters east to west by six meters north to south. Artifacts observed within locus 3 include: 29 brown cryptocrystalline silicate chert flakes (nine primary, 12 secondary, and eight tertiary), two brown cryptocrystalline silicate chert shatter, and one quartzite hammerstone.

Located outside the loci and within 30 meters are four individual brown cryptocrystalline silicate chert flakes (three primary and one secondary).The further character of artifacts associated with JF-005 is unreported.

The more particular physical context for JF-005, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists primarily of secondary flakes, a uni-directional core and two hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the two primary stone materials reduced in this lithic scatter (green metavolcanic and brown cryptocrystalline silicate chert) are typical constituents of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least three single reduction localities or episodes, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. JF-005 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area there is very low likelihood for subsurface archaeological deposits, therefore data potential is considered exhausted through recordation of JF-005.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, JF-005 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

CA-IMP-3752/3753/8731 (JM-001)

This is an update to previously recorded sites CA-IMP-3752/3753/8731, which have been combined due to the presence of sparse assemblages of artifacts within 30 meters of one another. CA-IMP-3752/3753/8731 is an oblong-shaped lithic and ceramic scatter that covers a total surface area of 1,117.08 square meters. The site is located within the eastern portion of the 450 MWarea of the Proposed IVS Project. The site is situated within a younger fan (formed in the Late Holocene) fan apron/skirt geomorphic landform, which was formed in the Late Pleistocene/Early Holocene (URS, 2009). The site is situated atop an intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles overlaying coarse sands and fine gravels. The site is partially located in an ephemeral gully. Vegetation species on the site include creosote and bunch grass.

This lithic and ceramic scatter site measures 29 meters north to south by 58 meters east to west, and contains a total of 24 prehistoric artifacts. It consists of one concentration interpreted to be a single reduction locus, with 16 artifacts. Eight additional artifacts were observed outside the locus. The prevailing cultural constituents within this site consist of prehistoric artifacts. Artifact density at JM-001 is low, with a calculated distribution of one artifact per 46.55 square meters. The overall condition of the site is fair with some alterations due to off-highway vehicles.

The artifact types and materials present at the site include: 19 metavolcanic flakes (eight primary, five secondary, six tertiary), one white cryptocrystalline silicate secondary flake, one metavolcanic hammerstone, one yellow-brown cryptocrystalline silicate core, and two ceramic Tizon brownware rim sherds.

Locus 1 is located in the western central portion of the site and measures one meter north to south by 0.3 meters east to west. Artifacts observed within Locus 1 include 16 green metavolcanic flakes (eight primary, five secondary and three tertiary).

Those artifacts observed within 30 meters and outside of the locus consist of three green metavolcanic tertiary flakes, one white cryptocrystalline silicate secondary flake, one metavolcanic hammerstone, one yellow-brown cryptocrystalline silicate core and two ceramic Tizon brownware rim sherds. The further character of artifacts associated within CA-IMP-3752/3753/8731 is unreported.

The more particular physical context for CA-IMP-3752/3753/8731, extrapolating information from Data Response 112 Figure 4 (URS 2009), to the location of the site, appears to be within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. Large fan aprons dominate the central portion of the project area and enter the basin floor up to three kilometers from the Lake Cahuilla high shoreline, and extend up to, and in some places, past that line. The surface consists of finer grain material eroded from the fan piedmont that has formed a number of fan “aprons” which do not individually fully cover the entire area, and which intermingle and partially bury one another and piedmont remnants. The lack of soil development within the capped alluvial unit, and the similar degree of pavement development between the two units suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time; thus reducing the potential for extensive buried archaeology on that surface. However, the site is located on a younger fan which was likely formed in the late Holocene, which would increase that potential. None the less, though this area does demonstrate the potential for (shallowly) buried preserved surfaces, there is a high likelihood these deposits will represent the same constituents recorded on the surface.

The primary constituents of the artifact assemblage at CA-IMP-3752/3753/8731 are flaked stone debitage. Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret the lithic component of this site as representing expedient tool technology (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists of primary, secondary, and tertiary flakes, cores, and hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this site are of two primary stone materials (metavolcanic and cryptocrystalline silicate) that are constituents of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least two single reduction localities or episodes, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time

Ceramic sherds such as the two present at CA-IMP-3752/3753/8731 that are identified as Tizon brownware can possibly provide information ceramic production technology and the ethnic origin of the vessels they can from. The presence of ceramics at this site place it in the Late Prehistoric period. Currently, the primary ethnic groups known to have occupied region surrounding CA-IMP-3752/3753/8731 include the Diegueño and Tipai (Kamia). Other groups known to have used/traveled/inhabited the area include the Cocopa, Kumeyaay, Ipai, Quechan, Paipai and Cahuilla (Luomala 1978; Schaefer and Laylander 2007, URS 2009). In approximately AD 1200, the course of the Colorado River changed, refilling Lake Cahuilla and providing a stable water source and drawing people from surrounding regions to repopulate the Colorado Desert. Ceramic wares which were introduced centuries before in other areas were brought into this region at that time (URS 2009). However, it has been argued that stable populations around the lake developed their own distinctive pottery formulas that became regional expressions of their families and locales (May ND). Although these groups each had specific approaches to the creation of ceramics, ceramic vessels were also traded along with subsistence resources and other items, infusing some uncertainty into the use of data from ceramics to associate one particular area with a particular tribal group or family. Therefore, it is unlikely that surface data could directly relate CA-IMP-3752/3753/8731 or the area surrounding it to a particular tribe.

Data gathered on ceramics in the area surrounding CA-IMP-3752/3753/8731 show evidence of a variety of ceramic types and techniques. Though paddle-and-anvil construction techniques were common among groups using this area, the tempers employed, vessel types manufactured, and decoration did vary between groups. The Diegueño used ground clay and did not add temper when manufacturing ceramics. They created a variety of vessels including ollas; bowls, cooking pots, and pipes. The Kamia sometimes added rose quartz as temper and produced the greatest variety of ceramics among the Yuman bands, including ollas, jars, canteens, bowls, rattles, plates, scoops, cups, and parchers. Kamia ceramics were painted after firing with red and/or black designs. The Cocopah used ground and winnowed clay tempered with ground sherds to create a variety of vessels used for storage and cooking. Quechan vessel types include bowls, parchers, cooking pots, small figurines, and large storage vessels that were used to float goods across rivers. (URS 2009).

The analysis necessary to derive all possible data from these sherds is best accomplished by a specialist and therefore beyond the scope of typical fieldwork. Therefore it is recommended that the four ceramic sherds present at CA-IMP-3752/3753/8731 be further analyzed prior to making a final determination of eligibility.

Based on currently available data, this site, with the exception of ceramics (discussed below), lacks artifacts with unique or temporally diagnostic characteristics; therefore the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. CA-IMP-3752/3753/8731 is located within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. The lack of soil development within the capped alluvial unit suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time, thus reducing the potential for extensive buried archaeological deposits. As a result, there is a very low to moderate likelihood for subsurface deposition. Nonetheless, though this area does demonstrate some potential for (shallowly) buried preserved surfaces, there is a high likelihood these deposits will represent the same constituents recorded on the surface.

Due to the presence of temporally diagnostic artifacts (ceramics) further data is necessary to determine if this site, as a stand-alone or individual resource, should be recommended as eligible or not eligible for the National Register and if it is or is not a historic property pursuant to the National Register or a historical resource per the California Register under the criteria for eligibility. In addition, results of additional data are necessary to determine if JM-001 is considered a contributor to an existing and/or proposed archaeological district or landscape.

JM-005

JM-005 is an amorphous-shaped lithic scatter that covers a total surface area of 98 square meters. The site is located within the eastern portion of the 450 MW area of the Proposed IVS Project. The site is situated on a slightly elevated, older remnant surface of the piedmont within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation (URS 2009). The surface area of the site consists of intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Vegetation species on the site include creosote, burroweed and salt bush.

This lithic reduction site measures 32 meters northeast to southwest by 13 meters northwest to southeast, and contains a total of 11 prehistoric artifacts. It consists of a single concentration interpreted to be a single reduction locus with eight artifacts and three additional artifacts observed outside the locus. The prevailing cultural constituents within this site consist of prehistoric artifacts. Artifact density at JM-005 is low, with a calculated distribution of one artifact per 8.9 square meters. The overall condition of the site is fair due to off-highway vehicle activity and alluvial scouring.

This site consists of one single reduction locus and a total of 11 artifacts, which include: eight metavolcanic flakes (three primary, three secondary and two tertiary), one unifacial quartz mano and two metavolcanic multi-directional cores.

Locus 1 is located within the southern boundary of the site and measures two meters north to south by two meters east to west. Artifacts observed within Locus 1 include seven metavolcanic flakes (2 primary, 3 secondary and 2 tertiary) and one metavolcanic multi-directional core. Those artifacts observed within 30 meters and outside of the locus consist of: one green metavolcanic primary flake, one quartz unifacial mano and one battered core. The further character of artifacts found within JM-005 is unreported.

The more particular physical context for JM-005, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be on an older fan remnant mantled by a younger fan apron within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. The surface consists of finer grain material eroded from the fan piedmont that has formed a number of fan "aprons" which do not individually fully cover the entire area, and which interfinger and partially bury one another and piedmont remnants. The lack of soil development within the capped alluvial unit, and the similar degree of pavement development between the two units, suggests this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time; thus reducing the potential for extensive buried archaeology on that surface. Nonetheless, this area does demonstrate the potential for (shallowly) buried preserved surfaces, but there is a high likelihood these deposits will represent the same constituents recorded on the surface. As a result, there is a very low to moderate likelihood for subsurface deposition.

The desert pavement consists of small to large, sub-rounded to sub-angular metavolcanic, basalt, quartz, quartzite and granite gravels and cobbles overlaying coarse sands and fine gravels.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature; debitage consists primarily of primary, secondary, and tertiary flakes, and two cores. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone material (metavolcanic) that is a constituent of the surrounding area, and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent a single reduction locality or episode; but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Archaeologists for the applicant interpret that ground stone tools such as the single mano present at this site were made by grinding, abrading, pecking, pounding, and polishing rather than chipping and flaking. Manos were smaller, soap and loaf-shaped stones that were moved in a circular motion against a metate or grinding slab in order to grind small seeds and other food resources. Manos are associated with subsistence procurement and/or processing (Chartkoff and Chartkoff 1984). However, the particular mano present at this site shows no visible characteristics that might provide additional information regarding regional subsistence activities.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction; and analysis of artifact distribution has been accounted for during the recordation process. JM-005 is located within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. The lack of soil development within the capped alluvial unit suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time, thus reducing the potential for extensive buried archaeological deposits. As a result, there is a very low to moderate likelihood for subsurface deposition. Nonetheless, though this area does demonstrate some potential for (shallowly) buried preserved surfaces, there is a high likelihood these deposits will represent the same constituents recorded on the surface. Therefore, due to the low density of artifacts and low probability for significant subsurface artifacts, the data potential is considered exhausted through recordation of JM-005.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, JM-005 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

JM-008

JM-008 is a circular-shaped lithic scatter that covers a total surface area of 16 square meters. The site is located within the northern portion of the 450 MW area of the Proposed IVS Project. The site is situated within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation (URS 2009). Portions of the surface area of the site consist of intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels. The desert pavement once covering other portions of the site has since been disturbed. The landform appears to be an older remnant that is heavily deflated and bound on all sides by active seasonal drainages. Vegetation species on the site include creosote and burroweed.

This lithic scatter site measures 5 meters north to south by 6 meters east to west, and contains a total of nine prehistoric artifacts. Artifact density at JM-008 is low, with a calculated distribution of one artifact per 1.74 square meters. The overall condition of the site is good with recent disturbance from emphemeral gullies, off-highway vehicle activity and alluvial erosion.

This site consists of nine green metavolcanic flakes (one primary flake, five secondary flakes, two tertiary flakes, and one piece of angular waste/shatter). The further character of artifacts found within JM-008 is unreported.

The more particular physical context for JM-008, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. The surface consists of finer grain material eroded from the fan piedmont that has formed a number of fan "aprons" which do not individually fully cover the entire area, and which interfinger and partially bury one another and piedmont remnants. The lack of soil development within the capped alluvial unit, and the similar degree of pavement development between the two units, suggests this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time; thus reducing the potential for extensive buried archaeology on that surface. Nonetheless, this area does demonstrate the potential for (shallowly) buried preserved surfaces, but there is a high likelihood these deposits will represent the same constituents recorded on the surface. As a result, there is a very low to moderate likelihood for subsurface deposition. The desert pavement consists of small to large, sub-rounded to sub-angular metavolcanic, basalt, quartz, quartzite and granite gravels and cobbles overlaying coarse sands and fine gravels.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists of metavolcanic flakes. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because all the lithic materials reduced in this lithic scatter are of the same primary stone material (metavolcanic) that is a constituent of the surrounding area, and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent a single reduction locality or episode; but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction; and analysis of artifact distribution has been accounted for during the recordation process. JM-008 is located within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. The lack of soil development within the capped alluvial unit suggests this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time, thus reducing the potential for extensive buried archaeological deposits. As a result there is a very low to moderate likelihood for subsurface deposition. Nonetheless, though this area does demonstrate some potential for (shallowly) buried preserved surfaces, there is a high likelihood these deposits will represent the same constituents recorded on the surface. Therefore, due to the low density of artifacts and low probability for significant subsurface artifacts, the data potential is considered exhausted through recordation of JM-008.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, JM-008 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

CA-IMP-2083 (JM-009)

This record is an update to a previously recorded site CA-IMP-2083. CA-IMP-2083 was originally recorded by Howard Pritchett in January of 1978. Pritchett described the site as a "chipping station with core, chopper, and debitage." He further described the debitage as consisting of four large pieces and four small pieces and described the core as a "good core." Pritchett gave no further details about the characteristics of artifacts found at the site.

CA-IMP-2083 is an oblong-shaped lithic scatter that covers a total surface area of 375.5 square meters. The site is located within the eastern portion of the 450 MW area of the Proposed IVS Project. The site is situated within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation (URS 2009). The surface area of the site consists of open elevated older fan remnants mantled by younger fan surfaces covered by disturbed desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Vegetation species on the site include creosote, burrow bush, and saltbush.

This lithic scatter site measures 40 meters northeast to southwest by 13 meters northwest to southeast, and contains a total of 52 prehistoric artifacts. It consists of two concentrations interpreted to be two single reduction loci, with 50 artifacts and two additional artifacts observed outside the loci. The prevailing cultural constituents within this site consist of prehistoric lithic debitage. Artifact density at CA-IMP-2083 is low, with a calculated distribution of one artifact per 7.2 square meters. The overall condition of the site is fair with alterations from off-highway vehicles observed.

CA-IMP-2083 consists of two single reduction loci and a total of 50 artifacts, which include: 47 gray metavolcanic flakes (12 Primary, 18 secondary, 13 tertiary and five shatter), one gray metavolcanic multi-directional core, one gray metavolcanic tested cobble and two yellow chert flakes (one tertiary and one shatter).

Locus 1 is located in the northeastern portion of the site and measures 6 meters north to south by 3 meters east to west. Artifacts observed within Locus 1 include 18 gray metavolcanic flakes (seven primary flakes, seven secondary flakes, three tertiary flakes and one shatter) and one gray metavolcanic multi-directional core.

Locus 2 is located 32 meters southwest of Locus 1 and measures 4 meters north to south by 5 meters east to west. Artifacts observed within Locus 2 include 29 gray metavolcanic flakes (five primary flakes, 10 secondary flakes, 10 tertiary flakes, and four shatter) and two yellow cryptocrystalline silicate chert flakes (one tertiary flake and one shatter).

Those artifacts observed within 30 meters and outside of the loci consist of one gray metavolcanic secondary flake and one gray metavolcanic tested cobble. The further character of artifacts found within CA-IMP-2083 is unreported.

The more particular physical context for CA-IMP-2083, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. The surface consists of finer grain material eroded from the fan piedmont that has formed a number of fan "aprons" which do not individually fully cover the entire area, and which intermingle and partially bury one another and piedmont remnants. The lack of soil development within the capped alluvial unit, and the similar degree of pavement development between the two units, suggests this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time; thus reducing the potential for extensive buried archaeological deposits. Nonetheless, this area does demonstrate the potential for (shallowly) buried preserved surfaces, but there is a high likelihood these deposits will represent the same constituents recorded on the surface. As a result, there is a very low to moderate likelihood for subsurface deposition. The desert pavement consists of small to large, sub-rounded to sub-angular metavolcanic, basalt, quartz, quartzite and granite gravels and cobbles overlaying coarse sands and fine gravels.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, and debitage consists primarily of metavolcanic primary, secondary, tertiary flakes, a single metavolcanic multi-directional core, and angular waste/shatter. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone (metavolcanic) material that is a constituent of the surrounding area, and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent two single reduction localities or episodes; but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction; and analysis of artifact distribution has been accounted for during the recordation process. CA-IMP-2083 is located within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. The lack of soil development within the capped alluvial unit suggests this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time; thus reducing the potential for extensive buried archaeological deposits. As a result, there is a very low to moderate likelihood for subsurface deposition. Nonetheless, though this area does demonstrate some potential for (shallowly) buried preserved surfaces, there is a high likelihood these deposits will represent the same constituents recorded on the surface. Therefore, due to the low density of artifacts and low probability for significant subsurface archaeological deposits, the data potential is considered exhausted through recordation of CA-IMP-2083.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, CA-IMP-2083 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

JM-020

JM-020 is an oblong-shaped archaeological deposit that covers a total surface area of 315.4 square meters. The site is located within the northern portion of the waterline 100-foot buffer of the Proposed IVS Project. The site is situated within the older fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation (URS 2009). The surface area of the site consists of intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposing granitic gravels and cobbles. Vegetation species on the site include creosote.

This lithic scatter and historic refuse deposit site measures 63 meters northwest to southeast by seven meters northeast to southwest, and contains a total of 97 prehistoric and two historic artifacts. The prehistoric component consists of five concentrations interpreted to be five single reduction loci, with 93 artifacts. Four additional prehistoric artifacts were observed outside the loci. The historic component consists of two artifacts. The prevailing cultural constituents within this site consist of prehistoric artifacts. Artifact density at JM-020 is low, with a calculated distribution of one artifact per 3.22 square meters. The overall condition of the site is good though there are several off-road vehicle tracks in the area.

The artifact types and materials present at the site include: 49 metavolcanic flakes (23 primary, 20 secondary and six shatter), 43 quartz flakes (12 primary, 23 secondary and eight shatter), one cryptocrystalline silicate chert secondary flake, two metavolcanic multi-directional cores, one quartzite hammerstone, one quartz tested cobble, one broken colorless glass jar with 25 fragments including the base with an Owens-Illinois maker's mark, and one hole-in-top milk can (3.9375 inches by 2.9375 inches).

Locus 1 is located 10.5 meters north of the site datum and measures two meters east to west by one meter north to south. Artifacts observed within Locus 1 include 43 quartz flakes (12 primary, 23 secondary and eight shatter) and one quartz tested cobble.

Locus 2 is located 22 meters north of Locus 1 and measures one meter east to west by one meter north to south. Artifacts observed within Locus 2 include eight metavolcanic flakes (six primary and two secondary).

Locus 3 is located 45 meters east of Locus 2 and measures two meters east to west by one meter north to south. Artifacts observed within Locus 3 include 12 metavolcanic flakes (five primary, six secondary and one shatter).

Locus 4 is located two meters northeast of Locus 3 and measures two meters east to west by 0.5 meters north to south. Artifacts observed within Locus 4 include five metavolcanic flakes (two primary and three secondary).

Locus 5 is located 17 meters southeast of Locus 4 and measures one meter north to south by one meter east to west. Artifacts observed within Locus 5: include 22 metavolcanic flakes (nine primary, eight secondary and five shatter), one metavolcanic multidirectional core and one quartzite hammerstone.

Those artifacts observed within 30 meters and outside the loci include: two metavolcanic flakes (one primary and one secondary), one cryptocrystalline silicate chert secondary flake, one metavolcanic multi-directional core, one broken colorless glass jar with 25 fragments including the base with an Owens Illinois maker's mark, and one hole-in-top milk can (3.9375 inches by 2.9375 inches). The further character of artifacts associated with JM-020 is unreported.

The more particular physical context for JM-020, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. Large fan aprons dominate the central portion of the Project area and enter the basin floor up to 3 kilometers from the Lake Cahuilla high shoreline, and extend up to, in some places, past that line. The surface consists of finer grain material eroded from the fan piedmont that has formed a number of fan “aprons” which do not individually fully cover the entire area, and which interfinger and partially bury one another and piedmont remnants. The lack of soil development within the capped alluvial unit, and the similar degree of pavement development between the two units, suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time; thus reducing the potential for extensive buried archaeology on that surface. Nonetheless, this area demonstrates the potential for (shallowly) buried preserved surfaces, but there is a high likelihood these deposits will represent the same constituents recorded on the surface. As a result, there is a very low to moderate likelihood for subsurface deposition. The desert pavement consists of small to large, sub-rounded to sub-angular metavolcanic, basalt, quartz, quartzite and granite gravels and cobbles overlaying coarse sands and fine gravels.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret the lithic component of this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists primarily metavolcanic and quartz flakes, with two metavolcanic cores and one quartzite hammerstone. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced at this site are of two primary stone materials (metavolcanic and quartz) that are constituents of the surrounding area, and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least five single reduction localities or episodes. It should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Deposits of historic artifacts such as these typically represent episodes of refuse disposal after initial discard and/or loss of individual articles in-situ. In the case of JM-020, the small number of artifacts and artifact types present would more likely have resulted from in-situ disposal rather than dumping of the wide range of artifact types that would be expected in an assemblage of common household refuse. Though dates of manufacture can be determined for some of the artifacts present at JM-020, the time between the initial use/consumption of the artifacts and their ultimate disposal cannot be known; so the specific date of their disposal cannot be reliably determined. Hole-in-cap cans such as the lap-seam cans present at this site were initially introduced in the mid-19th century, were common in the late 19th to early 20th century, and fell out of favor in the 1920s when most manufacturers switched to sanitary cans (Goodman 2002). The single bottle base present bears an Owens-Illinois maker's mark with a date code of "0", indicating that it was manufactured in 1930 or 1940. Two digit date codes were not in use at Owens-Illinois until the 1950s, so the exact year cannot be known (Lockwood 2004). Based on this data it would follow that the deposition of historic artifacts at JM-020 occurred sometime after1930.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction; and analysis of artifact distribution has been accounted for during the recordation process. JM-020 is located within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. As a result, there is a very low to moderate likelihood for subsurface deposition. Nonetheless, though this area does demonstrate some potential for (shallowly) buried preserved surfaces, there is a high likelihood these deposits will represent the same constituents recorded on the surface. Therefore, due to the low density of artifacts and low probability for significant subsurface artifacts, the data potential is considered exhausted through recordation of JM-020.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, JM-020 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

JM-026

JM-026 is an amorphous-shaped archaeological deposit that covers a total surface area of 14,335 square meters. The site is located within the northeastern portion of the 450

MW area of the Proposed IVS Project. The site is situated within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation (URS 2009). The surface area of the site consists of moderately developed intact desert pavement with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Much of the site is situated atop an older, relatively stable piedmont remnant, with portions of the southern margin eroding into an adjacent wash. Throughout the site, particularly in the south and east, are shallow, ephemeral gullies and drainages. Vegetation species on the site include: creosote, ocotillo, burrobush/burroweed and bunch grass.

This archaeological deposit measures 305 meters north to south by 306 meters east to west, and contains a total of 1,319 prehistoric and 676 historic artifacts. The prehistoric component consists of two possible deflated hearth features and 69 concentrations interpreted to be 49 single lithic reduction loci and 20 multiple lithic reduction loci. The historic component consists of one rock collection pile and three artifact concentrations interpreted to be historic refuse disposal (dumping) loci. The prevailing cultural constituents within this site consist of prehistoric lithic reduction debitage and historic household refuse. Artifact density at JM-026 is low, with a calculated distribution of one artifact per 7.19 square meters. The overall condition of the site is fair due to several off-highway vehicle tracks that cross the site.

The artifact types and materials that comprise the prehistoric component of JM-026 include: 428 metavolcanic flakes (148 primary, 182 secondary, 60 tertiary and 38 angular waste/shatter), 500 quartz flakes (112 primary, 217 secondary, 98 tertiary and 73 angular waste/shatter), 88 quartzite flakes (52 primary, 33 secondary, one tertiary and two angular waste/shatter), 100 chert flakes (49 primary, 43 secondary, six tertiary and two angular waste/shatter), 30 cryptocrystalline flakes (six primary, 17 secondary and seven tertiary), 12 chalcedony (eight primary, one secondary, two tertiary and one angular waste/shatter), 24 petrified wood flakes (13 primary, nine secondary and two tertiary), 13 rhyolite flakes (seven primary, five secondary and one tertiary), five wonderstone flakes (two primary, two secondary and one tertiary), one basalt primary flake, 51 tested cobbles (19 quartz, 12 quartzite, 13 metavolcanic, five chert, one chalcedony and one petrified wood), 10 uni-directional cores (five metavolcanic, three quartz, one quartzite and one chert), 10 bi-directional cores (five metavolcanic, three quartz, one quartzite and one chert), 16 multi-directional cores (six metavolcanic, four quartz, three quartzite, two chert and one wondertstone), two exhausted cores (one metavolcanic and one quartz), 10 hammerstones (two metavolcanic and eight quartzite), three choppers (two metavolcanic and one quartzite), six edge modified flakes (two metavolcanic and four quartz), seven bifaces (one metavolcanic, two quartz, one quartzite and three chert) and three core tools (two metavolcanic and one chert).

The artifact types and materials that comprise the historic component of JM-026 include: 426 cans/can fragments, 212 whole glass fragments, 29 miscellaneous metal artifacts, seven historic ceramic sherds (including terracotta, white hardpaste earthenware and porcelain), one duct tape fragment, one bundle of finely braided wire and several organic items, including milled lumber, burned faunal bone and eggshell.

Feature 1 is located at the eastern edge of the site and measures two meters north to south by one meter east to west. Feature 1 consists of 29 granitic, quartzite and metavolcanic cobbles that are embedded in a semi-circular pattern and appear to be fire-affected. Feature 1 is interpreted to be a deflated hearth feature.

Feature 2 is located approximately 100 meters southwest of Feature 1 and measures two meters north to south by 140 centimeters east to west. Feature 2 consists of 35 irregular-shaped granitic and quartzite cobbles, which appear to be fire-affected and are eroding out of a gentle slope above an ephemeral drainage. Feature 2 is interpreted to be a deflated hearth feature.

Feature 3 is located approximately 51 meters southwest of Feature 2 and measures 75 centimeters north to south by 60 centimeters east to west. Feature 3 is a collection of rocks piled and embedded under a small creosote bush. The rocks include: 31 petrified wood cobbles, two chalcedony cobbles, one tested low grade chert cobble and one fossilized oyster shell. The rock pile contains one prehistoric artifacts. Feature 3 is interpreted to be a collection location or cache where lithic materials were aggregated prior to use.

Also present at JM-026 are 69 concentrations of prehistoric artifacts interpreted to be loci that are described as follows:

Locus 1 is located near the western boundary of the site and measures one meter north to south by one meter east to west. Artifacts observed within Locus 1 include five quartzite flakes (two secondary, one tertiary and two quartzite angular waste/shatter) and three tested quartzite cobbles.

Locus 2 is located five meters northeast of Locus 2 and measures 48 centimeters north to south by 38 centimeters east to west. Artifacts observed within Locus 2 include 11 low-grade chert flakes (eight primary and three secondary).

Locus 3 is located 27 meters west of Locus 2 and measures two meters northeast to southwest by one meter northwest to southeast. Artifacts observed within Locus 3 include 19 green porphyritic metavolcanic flakes (seven primary, nine secondary and three tertiary) and one green porphyritic metavolcanic multi-directional core.

Locus 4 is located 56 meters southeast of Locus 3 and measures one meter northeast to southwest by one meter northwest to southeast. Artifacts observed within Locus 4 include eight green porphyritic metavolcanic flakes (two primary, three secondary and three angular waste/shatter) and two green porphyritic metavolcanic tested cobbles.

Locus 5 is located 19 meters north of Locus 4 and measures one meter north to south by 14 centimeters east to west. Artifacts observed within Locus 5 include: two green porphyritic metavolcanic primary flakes, one green chert secondary flake and one green porphyritic metavolcanic bi-directional core.

Locus 6 is located nine meters east of Locus 5 and measures one meter northeast to southwest by one meter northwest to southeast. Artifacts observed within Locus 6 include 24 quartz crystal flakes (two primary, 15 secondary and seven tertiary).

Locus 7 is located 22 meters north of Locus 6 and measures two meters north to south by two meters east to west. Artifacts observed within Locus 7 include 20 quartz crystal flakes (three primary, five secondary and 12 tertiary).

Locus 8 is located 21 meters east of Locus 7 and measures four meters east to west by two meters north to south. Artifacts observed within Locus 8 include 18 green porphyritic metavolcanic flakes (four primary, 12 secondary and two shatter) and one quartzite hammerstone.

Locus 9 is located 23 meters southeast of Locus 8 and measures one meter northwest to southeast by one meter northeast to southwest. Artifacts observed within Locus 9 include: 16 quartz flakes (two primary, nine secondary, one tertiary and four angular waste/shatter), one tested quartz cobble and one tested chert cobble.

Locus 10 is located eight meters northeast of Locus 9 and measures one meter northwest to southeast by one meter northeast to southwest. Artifacts observed within Locus 10 include 13 quartzite flakes (seven primary and six secondary) and one green porphyritic metavolcanic unidirectional core.

Locus 11 is located four meters north of Locus 10 and measures one meter east to west by 58 centimeters north to south. Artifacts observed within Locus 11 include 12 green porphyritic metavolcanic flakes (four primary and eight secondary).

Locus 12 is located five meters northeast of Locus 11 and measures one meter northeast to southwest by 26 centimeters northwest to southeast. Artifacts observed within Locus 12 include 14 quartz flakes (two primary, five secondary, three tertiary and four angular waste/shatter).

Locus 13 is located 14 meters southeast of Locus 12 and measures 40 centimeters northwest to southeast by 22 centimeters northeast to southwest. Artifacts observed within Locus 13 include one quartzite primary flake and one quartzite tested cobble.

Locus 14 is located 11 meters east of Locus 13 and measures four meters north to south by three meters east to west. Artifacts observed within Locus 14 include: 17 white cryptocrystalline flakes (two primary, 10 secondary and five tertiary), nine quartzite flakes (six primary and three secondary), one green porphyritic metavolcanic tested cobble, one quartzite multi-directional core and one quartzite hammerstone.

Locus 15 is located 41 meters south of Locus 14 and measures two meters northwest to southeast by one meter northeast to southwest. Artifacts observed within Locus 15 include 17 quartz flakes (two primary, 10 secondary, three tertiary and two angular waste/shatter) and one quartz multi-directional core.

Locus 16 is located 54 meters north of Locus 15 and measures two meters east to west by one meter north to south. Artifacts observed within Locus 16 include five green porphyritic metavolcanic flakes (two primary and three secondary).

Locus 17 is located five meters southeast of Locus 16 and measures 48 centimeters east to west by 25 centimeters north to south. Artifacts observed within Locus 17 include two green porphyritic metavolcanic primary flakes and one green porphyritic metavolcanic tested cobble.

Locus 18 is located 16 meters east of Locus 17 and measures six meters north to south by six meters east to west. Artifacts observed within Locus 18 include: 28 green porphyritic metavolcanic flakes (15 primary, 11 secondary and two angular waste/shatter), three green porphyritic metavolcanic tested cobbles, one green porphyritic metavolcanic multidirectional core, six brown chert flakes (three primary and three secondary), one tested brown chert cobble, one chert core tool, eight quartzite flakes (five primary and three secondary), two tested quartzite cobbles, one quartzite multidirectional core, two petrified wood flakes (one primary and one secondary) and one tested petrified wood cobble.

Locus 19 is located 10 meters south of Locus 18 and measures one meter northeast to southwest by 27 centimeters northwest to southeast. Artifacts observed within Locus 19 include: one primary chert flake, one chert biface, one quartz tested cobble, one exhausted quartz core and one quartzite hammerstone.

Locus 20 is located 10 meters northwest of Locus 19 and measures two meters northeast to southwest by one meter northwest to southeast. Artifacts observed within Locus 20 include five quartzite flakes (two primary and three secondary).

Locus 21 is located 26 meters southeast of Locus 20 and measures one meter northwest to southeast by 48 centimeters northeast to southwest. Artifacts observed within Locus 21 include 11 quartz flakes (six primary, three secondary and two tertiary) and two tested quartz cobbles.

Locus 22 is located 16 meters southeast of Locus 21 and measures one meter northwest to southeast by one meter northeast to southwest. Artifacts observed within Locus 22 include: 12 chalcedony flakes (eight primary, one secondary, two tertiary and one angular waste/shatter), 11 petrified wood flakes (eight primary and three secondary) and four chert flakes (three primary and one secondary).

Locus 23 is located four meters south of Locus 22 and measures two meters northeast to southwest by one meter northwest to southeast. Artifacts observed within Locus 23 include nine brown chert flakes (seven primary and two secondary).

Locus 24 is located 15 meters east of Locus 23 and measures two meters northeast to southwest by 20 centimeters northwest to southeast. Locus 24 consists of a single lithic reduction locus. Artifacts observed within Locus 24 include four quartz flakes (two primary, one secondary and one angular waste/shatter) and one tested quartz cobble.

Locus 25 is located 39 meters southwest of Locus 24 and measures one meter north to south by one meter east to west. Artifacts observed within Locus 25 include 17 quartz flakes (three primary, 10 secondary, two tertiary and two angular waste/shatter).

Locus 26 is located 32 meters northwest of Locus 25 and measures 50 centimeters north to south by 39 centimeters east to west. Artifacts observed with Locus 26 include 11 quartzite flakes (seven primary and four secondary) and one quartzite uni-directional core.

Note: There is no Locus 27. In the process of data collection this number was inadvertently skipped.

Locus 28 is located 26 meters southwest of Locus 26 and measures one meter north to south by one meter east to west. Artifacts observed within Locus 28 include 13 quartz flakes (five primary, six secondary, one tertiary and one angular waste/shatter) and one tested quartz cobble.

Locus 29 is located 44 meters northeast of Locus 28 and measures three meters east to west by three meters north to south. Artifacts observed within Locus 29 include: 20 brown chert flakes (eight primary, seven secondary, three tertiary and two angular waste/shatter), two quartzite flakes (one primary and one secondary) and two tested quartzite cobbles.

Locus 30 is located 51 meters northeast of Locus 29 and measures two meters east to west by one meter north to south. Artifacts observed within Locus 30 include: 37 green porphyritic metavolcanic flakes (13 primary, 11 secondary, four tertiary and nine angular waste/shatter), one green porphyritic metavolcanic unidirectional core and one green porphyritic metavolcanic hammerstone.

Locus 31 is located nine meters southeast of Locus 30 and measures one meter northwest to southeast by 42 centimeters northeast to southwest. Artifacts observed within Locus 31 include five wonderstone flakes (two primary, two secondary and one tertiary) and one wonderstone multidirectional core.

Locus 32 is located nine meters east of Locus 31 and measures four meters east to west by 94 centimeters north to south. Artifacts observed within Locus 32 include: nine quartz flakes (three primary, five secondary and one shatter), one quartz uni-directional core, two tested quartz cobbles, five quartzite flakes (three primary and two secondary), eight green porphyritic metavolcanic flakes (three primary, two secondary and three shatter) and one green porphyritic metavolcanic bi-directional core.

Locus 33 is located 18 meters north of Locus 32 and measures two meters east to west by one meter north to south. Artifacts observed within Locus 33 include: 17 quartz flakes (three primary, 11 secondary and three shatter), one basalt primary flake and one quartz bi-directional core.

Locus 34 is located two meters north of Locus 33 and measures 30 centimeters north to south by 18 centimeters east to west. Artifacts observed within Locus 34 include one brown chert primary flake and one brown chert bi-directional core.

Locus 35 is located seven meters northeast of Locus 34 and measures one meter east to west by 30 centimeters north to south. Artifacts observed within Locus 35 include: four green porphyritic metavolcanic primary flakes, one green porphyritic metavolcanic bidirectional core and one quartzite hammerstone.

Locus 36 is located 36 meters northwest of Locus 35 and measures 56 centimeters northwest to southeast by 38 centimeters northeast to southwest. Artifacts observed within Locus 36 include three quartz primary flakes and two tested quartz cobbles.

Locus 37 is located 11 meters west of Locus 36 and measures one meter north to south by one meter east to west. Artifacts observed within Locus 37 include: nine quartz flakes (five primary, three secondary and one shatter), one quartz tested cobble and one quartz edge modified flake.

Locus 38 is located three meters north of Locus 37 and measures three meters north to south by one meter east to west. Artifacts observed within Locus 38 include six green porphyritic metavolcanic flakes (two primary and four secondary) and one green porphyritic metavolcanic multidirectional core.

Locus 39 is located two meters west of Locus 38 and measures 50 centimeters east to west by 44 centimeters north to south. Artifacts observed within Locus 39 include three quartzite flakes (two primary and one secondary) and one quartzite multidirectional core.

Locus 40 is located eight meters north of Locus 39 and measures three meters northeast to southwest by two meters northwest to southeast. Artifacts observed within Locus 40 include 25 green porphyritic metavolcanic flakes (eight primary, 16 secondary and one shatter).

Locus 41 is located five meters west of Locus 40 and measures 52 centimeters north to south by 48 centimeters east to west. Artifacts observed within Locus 41 include six low-grade chert flakes (three primary and three secondary) and one low-grade chert multidirectional core.

Locus 42 is located 30 meters southwest of Locus 41 and measures two meters northeast to southwest by one meter northwest to southeast. Artifacts observed within Locus 42 include: 30 chert flakes (nine primary, 18 secondary and three tertiary), one chert multidirectional core, 16 quartz flakes (three primary, seven secondary and six shatter), four quartzite flakes (three primary and one secondary) and one tested quartzite cobble.

Locus 43 is located one meter northeast of Locus 42 and measures one meter northeast to southwest by one meter northwest to southeast. Artifacts observed within Locus 43 include 11 petrified wood flakes (four primary, five secondary and two tertiary) and one green porphyritic metavolcanic secondary flake.

Locus 44 is located 65 meters northeast of Locus 43 and measures two meters north to south by one meter east to west. Artifacts observed within Locus 44 include: nine black porphyritic metavolcanic flakes (two primary, four secondary, one tertiary and two shatter), one green porphyritic metavolcanic primary flake, one green porphyritic metavolcanic tested cobble, one quartzite primary flake and one tested quartzite cobble.

Locus 45 is located 18 meters southeast of Locus 44 and measures three meters northeast to southwest by one meter northwest to southeast. Artifacts observed within Locus 45 include: 51 quartz flakes (five primary, 24 secondary, eight tertiary and 14 shatter), one tested quartz cobble, one quartz multidirectional core and nine rhyolite flakes (three primary, five secondary and one tertiary).

Locus 46 is located six meters north of Locus 45 and measures one meter northwest to southeast by one meter northeast to southwest. Artifacts observed within Locus 46 include seven rose quartz flakes (four primary and three secondary).

Locus 47 is located four meters east of Locus 46 and measures two meters east to west by one meter north to south. Artifacts observed within Locus 47 include five rose quartz flakes (three primary and two secondary).

Locus 48 is located 29 meters southeast of Locus 47 and measures two meters northwest to southeast by 72 centimeters northeast to southwest. Artifacts observed within Locus 48 include 33 green porphyritic metavolcanic flakes (12 primary, 12 secondary, seven tertiary and two shatter) and one green porphyritic metavolcanic bi-directional core.

Locus 49 is located one meter west of Locus 48 and measures one meter north to south by one meter east to west. Artifacts observed within Locus 49 include five green porphyritic metavolcanic flakes (three primary and two secondary).

Locus 50 is located 12 meters east of Locus 49 and measures one meter east to west by one meter north to south. Artifacts observed within Locus 50 include eight fine grain quartzite flakes (six primary and two secondary).

Locus 51 is located 30 meters northeast of Locus 50 and measures six meters northeast to southwest by four meters northeast to southwest. Artifacts observed within Locus 51 include: 70 quartz crystal flakes (nine primary, 23 secondary, 28 tertiary and 10 shatter), three green porphyritic metavolcanic flakes (two secondary and one tertiary), one tested green porphyritic metavolcanic cobble and one quartzite hammerstone.

Locus 52 is located 81 meters west of Locus 51 and measures two meters north to south by one meter east to west. Artifacts observed within Locus 52 include: 71 quartz flakes (nine primary, 30 secondary, 20 tertiary and 12 shatter), one quartz multi-directional core and one quartzite hammerstone.

Locus 53 is located 28 meters west of Locus 52 and measures 11 meters northeast to southwest by four meters northwest to southeast. Artifacts observed within Locus 53 include: 11 quartz flakes (three primary, seven secondary and one quartz shatter), one quartz multi-directional core, one quartz biface, one quartz edge modified flake, 57 green porphyritic metavolcanic flakes (12 primary, 18 secondary, 19 tertiary and eight shatter), one green porphyritic metavolcanic multi-directional core, one green porphyritic metavolcanic chopper, one green porphyritic metavolcanic edge modified flake and one fine grain quartzite biface (in three pieces).

Locus 54 is located 27 meters south of Locus 53 and measures two meters north to south by one meter east to west. Artifacts observed within Locus 54 include 29 green porphyritic metavolcanic flakes (11 primary, 10 secondary, five tertiary and three shatter) and one quartz tertiary flake.

Locus 55 is located one meter southwest of Locus 54 and measures five meters northeast to southwest by three meters northwest to southeast. Artifacts observed within Locus 55 include: 26 quartz flakes (eight primary, eight secondary, two tertiary and eight shatter), three tested quartz cobbles, one green porphyritic metavolcanic primary flake and one green porphyritic metavolcanic bi-directional core.

Locus 56 is located 11 meters west of Locus 55 and measures three meters north to south by two meters east to west. Artifacts observed within Locus 56 include 27 green porphyritic metavolcanic flakes (12 primary, 14 secondary and one tertiary) and one green porphyritic metavolcanic unidirectional core.

Locus 57 is located nine meters northwest of Locus 56 and measures one meter northwest to southeast by one meter northeast to southwest. Artifacts observed within Locus 57 include four green porphyritic metavolcanic flakes (one primary, two secondary and one tertiary).

Locus 58 is located 176 meters southwest of Locus 57 and measures 48 centimeters east to west by 34 centimeters north to south. Artifacts observed within Locus 58 include six quartz flakes (three primary and three secondary) and one quartz uni-directional core.

Locus 59 is located 214 meters northeast of Locus 58 and measures one meter east to west by one meter north to south. Artifacts observed within Locus 59 include: 10 green porphyritic metavolcanic flakes (four primary, five secondary and one tertiary), one green porphyritic metavolcanic tested cobble and one green porphyritic metavolcanic hammerstone.

Locus 60 is located three meters southeast of Locus 59 and measures 28 centimeters north to south by 24 centimeters east to west. Artifacts observed within Locus 60 include: three low-grade chert flakes (one primary and two secondary), one low-grade chert tested cobble and one fine grain quartzite chopper.

Locus 61 is located 57 meters north of Locus 60 and measures two meters east to west by two meters north to south. Artifacts observed within Locus 61 include: four cryptocrystalline flakes (two primary and two secondary), one green porphyritic metavolcanic secondary flake, one tested green porphyritic metavolcanic cobble, one green porphyritic metavolcanic chopper and one tested chalcedony cobble.

Locus 62 is located 23 meters northwest of Locus 61 and measures four meters northeast to southwest by two meters northwest to southeast. Artifacts observed within Locus 62 include: 47 green porphyritic metavolcanic flakes (13 primary, 15 secondary, 17 tertiary and two shatter), one green porphyritic metavolcanic biface and one green porphyritic metavolcanic core tool.

Locus 63 is located two meters south of Locus 62 and measures four meters north to south by two meters east to west. Artifacts observed in Locus 63 include 13 green porphyritic metavolcanic flakes (five primary and eight secondary) and one exhausted green porphyritic metavolcanic core.

Locus 64 is located 13 meters west of Locus 63 and measures five meters northwest to southeast by four meters northeast to southwest. Artifacts observed within Locus 64 include: seven green porphyritic metavolcanic flakes (one primary, five secondary and one shatter), one green porphyritic metavolcanic edge modified flake, one quartz primary flake, one quartzite primary flake and one tested quartzite cobble.

Locus 65 is located 23 meters southeast of Locus 64 and measures two meters east to west by 86 centimeters north to south. Artifacts observed within Locus 65 include 38 quartz flakes (12 primary, 18 secondary, six tertiary and two quartz shatter) and one quartz bi-directional core.

Locus 66 is located 80 centimeters southwest of Locus 65 and measures one meter northeast to southwest by one meter northwest to southeast. Artifacts observed within Locus 66 include nine black cryptocrystalline flakes (two primary, five secondary and two tertiary).

Locus 67 is located 42 meters west of Locus 66 and measures one meter northeast to southwest by 48 centimeters northwest to southeast. Artifacts observed within Locus 67 include: seven brown chert flakes (five primary and two secondary), one tested brown chert cobble, one chert bi-directional core and one quartzite hammerstone.

Locus 68 is located 35 meters south of Locus 67 and measures one meter northeast to southwest by 50 centimeters northwest to southeast. Artifacts observed within Locus 68 include four quartz flakes (three primary and one secondary).

Locus 69 is located 37 meters south of Locus 68 and measures one meter east to west by one meter north to south. Artifacts observed within Locus 69 include 15 quartz flakes (five primary, seven secondary, two tertiary and one shatter) and one tested quartz cobble.

Locus 70 is located 14 meters west of Locus 69 and measures two meters northeast to southwest by one meter northwest to southeast. Artifacts observed within Locus 70 include: nine fine grain quartzite flakes (five primary and four secondary), one fine grain quartzite bi-directional core and one quartzite hammerstone.

Those prehistoric artifacts observed within 30 meters and outside of the loci and features consist of: six green porphyritic metavolcanic flakes (four primary and two secondary), one tested green porphyritic metavolcanic cobble, two green porphyritic metavolcanic uni-directional cores, one green porphyritic metavolcanic multi-directional core, one black porphyritic metavolcanic core tool, three quartzite flakes (two primary and one secondary), one tested quartzite cobble, four rhyolite primary flakes, four quartz flakes (three primary and one secondary), three tested quartz cobbles, one quartz biface, one quartz uni-directional core, one quartz spall with a modified edge, one quartz edge modified flake, one rose quartz bi-directional core, one brown chert biface, one highly weathered chert biface, one chert secondary flake, one tested chert cobble and one chert uni-directional core.

The historic component of JM-026 contains three concentrations interpreted to be loci that are described as follows:

Locus 71 is located 100 meters south of Locus 70 and measures six meters east to west by three meters north to south and consists of a deposit of household trash. A total of 313 artifacts were observed within Locus 71 including: 149 tin can and can fragments, approximately 133 glass fragments, four whole glass artifacts, 24 miscellaneous metal artifacts, two fragments of a porcelain plate with a scalloped edge, several fragments of milled lumber, one bundle of finely braided wire and several fragments of burned faunal bone. The organic artifacts and a few of the glass artifacts appear burned, but overall the deposit does not appear to have burned in-situ.

A total of 149 cans and can fragments were identified in Locus 71 including: 14 church key-opened hole-in-top cans with a diameter of 2 and 15/16 inches and a height of 3 and 15/16 inches, 38 church key-opened beverage cans with a diameter 2 and 11/16 inches and a height of 6 and 4/16 inches, 43 rotary-opened sanitary cans (three with a diameter of 2 and 12/16 inches and a height of 4 inches, nine with a diameter of 2 and 10/16 inches and a height of 3 and 4/16 inches, seven with a diameter of 2 and 11/16 inches and a height of 2 and 10/16 inches, six with a diameter of 3 inches and a height of 4 and 6/16 inches, eight with a diameter of 3 and 6/16 inches and a height of 1 and 13/16 inches, one with a diameter of 3 and 2/16 inches and a height of 4 and 6/16 inches, four with a diameter of 3 and 4/16 inches and a height of 4 and 6/16 inches, one with a diameter of 4 inches and a height of 6 and 2/16 inches, one with a diameter of 2 and 12/16 inches and a height of 2 and 12/16 inches, two with a diameter of 2 and 13/16 inches and a height of 4 and 14/16 inches and one with a diameter of 3 and 5/16 inches and a height of 4 and 9/16 inches), nine rotary removed sanitary can lids, one sanitary can with an unknown opening that has a diameter of 2 and 11/16 inches and a height of 4 and 14/16 inches, 28 crushed sanitary cans, one aerosol can with a diameter of 2 and 12/16 inches and an approximate height of 5 and 4/16 inches, one rectangular key wind and strip can with a length of 3 inches a width of 2 and 4/16 inches and an approximate height of 3 and 8/16 inches, one key wind and strip can with a diameter of 2 and 12/16 inches and a height of 1 and 14/16 inches, one key wind and strip can with a diameter of 2 and 14/16 inches and an unknown height, one rectangular key wind and strip removed lid with an approximate width of 5 inches and an unknown length, one key wind and strip removed deviled ham lid with an approximate width of 6 inches and an approximate length of 9 and 4/16 inches, seven key wind and strips, one fragment of an external friction seal can, one internal friction seal coffee can lid fragment with a diameter of 5 and 4/16 inches that is embossed with REGULAR GRIND and COFFEEPOT and one cardboard tube lid with a diameter of 2 and 2/16 inches.

Of the 133 glass fragments in Locus 71, approximately 100 are colorless glass from an estimated minimum of 19 bottles or jars, 10 are aquamarine window pane glass, 13 are green glass from one beverage bottle, one is a screw top bottle neck from a brown glass chemical bottle, nine are colorless glass bottle or jar bases (one with the marks Revlon in cursive and 1, one with the marks 1063-S, MG and 32, one with the marks of an H over an A, 6590, and 4, one with the marks of an H over A and 5298, one with the marks C, a G interconnected with a C, 5, 3656 and 5, one with the marks M-25B78, D-9, 101, an I inside an O, 57 and 4A, one with the marks 101, an I inside an O, 56, D-9, 25, B and 9, one with the marks DIXIE and 8 and one with the marks 3502 an I in a square 56 and C). Of the four whole glass artifacts one is a colorless glass open mouth jar with the base marks C-4139, 9, an I inside an O, 7 and 2, one is a colorless glass jar with no base mark, one is a colorless glass tumbler with the base mark of an H over an A and one is a colorless cosmetic or medicine jar with the base mark 3.

Twenty-four miscellaneous metal artifacts were identified in Locus 71 including: 17 crown caps, one metal wire spool that has a diameter of 2 and 6/16 inches and a height of 10/16 inches, one aluminum battery with a wire connection for a battery pack, three battery cores, one fragment of galvanized steel pipe and one fragment of a decorative unknown metal object.

Locus 72 is located 180 meters northeast of Locus 71. Locus 72 measures six meters northwest to southeast by three meters northeast to southwest and consists of a deposit of household trash. A total of 101 artifacts were observed within Locus 72 including: 94 cans and can fragments, one external friction jar lid with a diameter of 2 and 6/16 inches, four whole glass artifacts and two white porcelain tableware fragments. Of the 94 can and can fragments, 60 are sanitary cans (buried), two are beverage cans with an unknown opening that have a diameter of 2 and 11/16 inches and a height of 6 and 4/16 inches, one is a church key-opened sanitary can with a diameter of 4 and 4/16 inches and an unknown height, one is a church key-opened beverage can (buried), six are beverage cans (buried), one is a key wind and strip can with a diameter of 5 and 2/16 inches and an unknown height, one is a hole-in-top can with a diameter of 2 and 5/16 inches and a height of 3 and 15/16 inches, seven are hole-in-top cans (buried), four are crushed beverage cans, one is a rotary-opened sanitary can with a diameter of 2 and 11/16 inches and a height of 2 and 10/16 inches, four are crushed sanitary cans, one is a crushed hole-in-top can, one is a crushed large external friction can, one is a deviled ham lid fragment, one is an internal friction seal lid with a diameter of 3 and 13/16 inches and two are key wind and strip removed coffee lid fragments (one embossed REGULAR and one embossed with GRIND and PERCOLATOR).

A total of 25 artifacts were observed in a dispersed scatter around Locus 72 including: one crushed rectangular can, 23 whole glass or glass fragments and one white porcelain plate fragment with a gold band. Of the 23 whole glass or glass fragments, seven are colorless glass jars, three are colorless glass medicine or liquor bottles, two are colorless glass bottles or jars marked on the base with 0-9, three are colorless glass jars marked on the base with BALL, one is a colorless glass bottle or jar marked on the base with an I in an O, two are brown glass household chemical bottles, one is a brown glass medicine or liquor bottle, two are brown glass bottles or jars marked on the base with LM and two are green glass beverage bottles.

Locus 73 is located 88 meters southwest of Locus 72. Locus 73 measures three meters northwest to southeast by two meters northeast to southwest and consists of a deposit of household trash, primarily food related. A total of approximately 180 artifacts were observed within Locus 73 including: 57 cans and 50 to 100 can fragments, 19 glass fragments, four miscellaneous artifacts (one cone shaped terracotta flower pot with a diameter of 3 and 6/16 inches and a height of 3/16 inches, one duct tape fragment, one screw top jar lid with a diameter of 2 and 8/16 inches and one external friction jar lid with a diameter of 2 and 1/16 inches) and several eggshell fragments. Of the 57 cans and 50 to 100 can fragments, one is a lid (buried), 32 are sanitary cans (buried), one is an external friction can with lid with a diameter of 5 and 2/16 inches and a height of 6 and 4/16 inches, one is an external friction lid with a diameter of 5 and 4/16 inches, 17 are beverage cans (buried), four are hole-in-top cans (buried), one is a rectangular spice can (buried), and 50 to 100 are small fragments of rusted tin cans. Of the 19 whole glass or glass fragments, two are colorless glass condiment jars, one is a colorless glass cosmetic or medicine bottle, five are colorless glass beverage bottles, three are colorless glass baby food jars, three are colorless glass fragments with the base mark I inside an O, one is a colorless glass bottle with the base mark BEST FOODS, one is a colorless glass bottle with a the base mark of two interlocking diamonds, one is a colorless glass bottle with the base mark DES. POT. 94824, two are green glass beverage bottles and one is a brown glass Clorox bottle with the base marks I inside an O, 80, CLOROX in a diamond and 28.

Those historic artifacts observed within 30 meters and outside of the concentrations and features consist of: nine hole-in-top cans with a diameter of 2 and 15/16 inches and a height of 3 and 15/16 inches, three sanitary cans (one with a crimp seam and rotary opened that has a diameter of 2 and 11/16 inches and a height of 2 and 10/16 inches, one with a 3 inch diameter and a height of 4 and 4/16 inches and one with a diameter of 3 and 2/16 inches and a height of 4 and 6/16 inches), one pull-tab beverage can with a diameter of 2 and 8/16 inches and a height of 4 and 13/16 inches, one coffee can with a diameter of 5 inches and a height of 6 and 8/16 inches, one coffee can with a height of 7 inches and an unknown diameter, one aluminum top can with a diameter of 2 and 8/16 inches and a height of 6 and 7/16 inches, one beverage can, one buried beverage can, one meat/fish can with a diameter of 3 and 7/16 inches and a height of 1 and 5/16 inches, one meat can lid, one internal friction seal lid with a diameter of 4 and 10/16 inches, one external friction seal lid with a diameter of 5 and 6/16 inches, one key wind removed lid with a diameter of 3 inches, two coffee cans with a diameter of 6 inches and a height of 3 and 7/16 inches, 27 fragments of an aqua colored cup and mold bottle with the base mark ROOT, two colorless glass condiment jars with the base marks M-25B75, D-9, 101, I inside an O, 57 and 2A, one blue glazed white hardpaste earthenware cup and one aluminum wash tub.

The further character of artifacts associated with JM-026 is unreported.

The more particular physical context for JM-026, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. Large fan aprons dominate the central portion of the Project area and enter the basin floor up to 3 kilometers from the Lake Cahuilla high shoreline, and extend up to, and in some places, past that line. The surface consists of finer grain material eroded from the fan piedmont that has formed a number of fan “aprons” which do not individually fully cover the entire area, and which interfinger and partially bury one another and piedmont remnants. The lack of soil development within the capped alluvial unit, and the similar degree of pavement development between the two units, suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time; thus reducing the potential for extensive buried archaeological deposits beneath that surface. Additionally, much of the site is situated atop an older, relatively stable piedmont remnant, the surface of which is mostly intact and moderately developed desert pavement, which further reduces the likelihood of buried surfaces. Nonetheless, this area does demonstrate the potential for (shallowly) buried preserved surfaces, but there is a high likelihood these deposits will represent the same constituents recorded on the surface. As a result, there is a very low to moderate likelihood for significant subsurface deposition.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret the prehistoric component of JM-026 as primarily an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, with debitage consisting of primary, secondary and tertiary flakes, uni-directional, bi-directional and multi-directional cores, angular waste/shatter and 10 hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same three primary stone materials (quartz, metavolcanic and quartzite) that are constituents of the surrounding area, and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least 97 single reduction localities or episodes. It should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

The presence of flaked stone tools such as the edge modified flakes and bifaces found at JM-026 is evidence of resource procurement and/or processing of faunal or floral resources. The creation of flaked stone tools requires additional lithic technologies, possibly including bifacial thinning and pressure flaking to shape and refine cutting edges.

Furthermore, archaeologists for the applicant interpret the presence of the hearth features or fire-affected rock as further evidence of resource processing and/or other activities. Hearth features found in association with lithic debitage could be evidence of more complex lithic resource processing activities. Lithic materials intended for flaked tool production were sometimes heat treated using open hearths in order to improve the flaking characteristics of the stone. Feature 2 may be one such hearth feature and may have been constructed to heat treat the chert found in nearby Locus 67. Additionally, open hearths were used in prehistory for various other purposes, such as parching seeds and grains, cooking and to provide personal warmth. Such features may also represent sacred/ritualistic activities associated with cremating the deceased and/or animals, although no calcined bone of any kind was found in association with these features. The conspicuous absence of any evidence of carbon residue and the paucity of artifacts would support the hypothesis that the hearth features associated with JM-026 are surface phenomenon that each resulted from a single episode of use.

Additionally, based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret that deposits of historic artifacts such as the ones found in the historic component of JM-026 typically represent episodes of refuse disposal (dumping). Though dates of manufacture can be determined for some of the artifacts present at JM-026, the time between the initial use/consumption of the artifacts and their ultimate disposal cannot be known, so the specific date of their disposal cannot be reliably determined.

Temporally diagnostic maker's marks were identified on 23 glass artifacts including: three with a Hazel-Atlas Glass Company mark that was used between 1920 and 1964

(Goodman 2002), one with Maywood Glass Company mark that was used between 1930 and 1961 (Goodman 2002), two with a Latchford-Marble Glass Company mark that was used between 1939 and 1957 (Goodman 2002), two with a Glass Containers mark that was in use between 1945 and circa 1971 (Goodman 2002), four with a Ball Brothers mark that has been in use since 1888 up though current times and 11 with an Owens-Illinois mark that has been in use since 1954. One of the Owens Illinois maker's marks carried a date code of "57", indicating it was manufactured in 1957, and another had a date code of "7", indicating that it was made in 1937 or 1947 (Owens Illinois did not change to two-digit date codes until the 1950s) (Lockhart 2004).

Other artifacts present at the site can be attributed to general date ranges. For example, hole-in-top cans such as the lap-seam cans present at this site were initially introduced in the mid-19th century, were common in the late 19th to early 20th century, and fell out of favor in the 1920s when most manufacturers switched to sanitary cans. In the western United States, sites such as this, where sanitary cans outnumber hole-in-cap cans, typically date to post 1922 (Goodman 2002). Also identified were glass bottle shards of a particular aqua color that was common between 1880 and 1920 (Goodman 2002). Additionally, there are beverage cans and hole-in-top cans that were opened with a large (3/4") church key, reflecting a date of consumption sometime between 1935 and the 1950s.

The combination of these maker's marks and artifact types indicate that the trash was likely deposited sometime after 1957. Additionally, there is virtually no refuse that can be attributed to the 1960s or after, so it seems likely that the time of disposal for all three refuse piles was soon after 1957.

Even though this site has artifacts with temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history.

Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction; and analysis of artifact distribution has been accounted for during the recordation process. JM-026 is located within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. The lack of soil development within the capped alluvial unit suggests this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time; thus reducing the potential for extensive buried archaeological deposits. As a result, there is a very low to moderate likelihood for subsurface deposition. Nonetheless, though this area does demonstrate some potential for (shallowly) buried preserved surfaces, there is a high likelihood these deposits will represent the same constituents recorded on the surface. Therefore, due to the low density of artifacts and low probability for significant subsurface artifacts, the data potential is considered exhausted through recordation of JM-026.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, JM-026 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

JM-029

JM-029 is an oblong shaped prehistoric site that covers a total surface area of 59.37 square meters. The site is located within the southeastern portion of the 450 MW area of the Proposed IVS Project. The site is situated within the fan piedmont remnant geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of desert pavement that is moderate to well-developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote and bunch grass.

This lithic scatter site measures 20 meters northwest to southeast by three meters northeast to southwest and contains a total of 28 prehistoric artifacts. It consists of two concentrations interpreted to be two single reduction loci. The areas between the loci are void of artifacts. The prevailing cultural constituents within this site consist of prehistoric lithic debitage. Artifact density at JM-029 is low, with a calculated distribution of one artifact per 2.12 square meters. The overall condition of the site is good.

The site contains two lithic reduction loci and a total of 28 artifacts, which include: 22 green metavolcanic flakes (five primary, 12 secondary and five tertiary), three green metavolcanic cores (two multi-directional and one bi-directional) and three hammerstones (one green metavolcanic, one gray metavolcanic and one granitic).

Locus 1 is located at the southeast edge of the site approximately six meters southeast of the site datum and measures two meters east to west by one meter north to south. Artifacts observed within Locus 1 include one gray metavolcanic hammerstone, one granitic hammerstone, two green metavolcanic multi-directional cores, and seven green metavolcanic flakes (two primary, three secondary and two tertiary).

Locus 2 is located 16 meters northwest of Locus 1 and measures two meters southwest to northeast by one meter northwest to southeast. Artifacts observed within Locus 2 consist of one gray/green metavolcanic bi-directional core, one green metavolcanic hammerstone, and 15 gray/green metavolcanic flakes (three primary, nine secondary and three tertiary).

The area outside the two loci is devoid of artifacts and features. The further character of artifacts associated with JM-029 is unreported.

The more particular physical context for JM-029, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be a very old fan surface within the fan piedmont remnant landform. The fan piedmont remnant landform is an isolated exposure surrounded by the fan apron landform that has been determined to have the same geomorphological characteristics as the fan piedmont (URS 2009: CUL-6). The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the

Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007); therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature; debitage consists of primary, secondary and tertiary flakes, multi-directional and bi-directional cores, with hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone (metavolcanic) material that is a constituent of the surrounding area, and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent two single reduction localities or episodes; but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. JM-029 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area there is very low likelihood for subsurface archaeological deposits. Therefore, data potential is considered exhausted through recordation of JM-029.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, JM-029 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

JM-030

JM-030 is a circular-shaped prehistoric lithic scatter site that covers a total surface area of 3.1 square meters. The site is located within the southeastern portion of the 450 MW area of the Proposed IVS Project. The site is situated within the fan piedmont remnant geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial silts and sands comprised of decomposing metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote, desert trumpet and bunch grasses.

This lithic scatter site measures one meter east to west by one meter north to south, and contains a total of 27 prehistoric artifacts. The site is one concentration interpreted to be a single lithic reduction locus. The prevailing cultural constituents within this site consist of prehistoric lithic reduction debitage. Artifact density at JM-030 is medium, with a calculated distribution of one artifact per 0.11 square meter. The overall condition of this site is good with minor natural erosion due to an adjacent ephemeral gully.

The site is a single lithic reduction locus that includes 26 green metavolcanic flakes (six primary, 12 secondary and eight tertiary) and one green metavolcanic bi-directional core. The further character of artifacts found within site JM-030 is unreported.

The more particular physical context for JM-030, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be a very old fan surface within the fan piedmont remnant geomorphic landform. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont remnant. The moderately consolidated or developed pavement is subject to natural erosion due to its proximity to an ephemeral gully.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature; debitage consists of primary, secondary, and tertiary flakes, and a single core. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this site are of the same primary stone material (metavolcanic) that is a constituent of the surrounding area, and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent a single reduction locality or episode. It should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction; and analysis of artifact distribution has been accounted for during the recordation process. JM-030 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands comprised of decomposing metavolcanic and granitic gravels and cobbles within the fan piedmont remnant geomorphic landform. This geomorphic landform indicates a Pleistocene (or older) period of formation, and because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits; therefore, data potential is considered exhausted through recordation of JM-030.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, JM-030 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

JM-042

JM-042 is an amorphous-shaped lithic scatter that covers a total surface of 7,179 square meters. The site is located within the southwest portion of the 450 MW area of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of relatively flat, disturbed desert pavement with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote, bunch grass and mesquite.

This lithic scatter site measures 90 meters north to south by 160 meters east to west, and contains a total of 200 prehistoric artifacts. It consists of nine concentrations interpreted to be single reduction loci, with no artifacts observed outside the loci. The prevailing cultural constituents within this site consist of prehistoric lithic artifacts. Artifact density at JM-042 is low, with a calculated distribution of one artifact per 24 square meters. The site also includes segments of a prehistoric trail (T-52). The overall condition of the site is fair.

The artifact types and materials present at JM-042 include: 157 green metavolcanic flakes (63 primary, 60 secondary, 34 tertiary), 22 quartz flakes, 13 cryptocrystalline silicate chert flakes, two green metavolcanic cores, two metavolcanic hammerstones, two cryptocrystalline silicate chert hammerstones, one quartz hammerstone, and one metavolcanic tested cobble.

Locus 1 is located within the southwest portion of the site boundary and is situated atop disturbed desert pavement. Locus 1 measures six meters north to south by five meters east to west. Artifacts observed within Locus 1 include 23 metavolcanic flakes (11 primary, 11 secondary and one tertiary) and one cryptocrystalline silicate core tool.

Locus 2 is located 38 meters west of Locus 1. Locus 2 measures two meters north to south by two meters east to west. Artifacts observed within Locus 2 include 22 quartz flakes (eight primary, eight secondary and six tertiary).

Locus 3 is located 33 meters west of Locus 2. Locus 3 measures three meters north to south by three meters east to west. Artifacts observed within Locus 3 include 20 metavolcanic flakes (eight primary, seven secondary and five tertiary) and one core tool.

Locus 4 is located 13 meters west of Locus 3. Locus 4 measures three meters north to south by four meters west to east. Artifacts observed within Locus 4 include 55 metavolcanic flakes (14 primary, 22 secondary, 19 tertiary).

Locus 5 is located 17 meters southwest from Locus 4. Locus 5 measures three meters north to south by four meters east to west. Artifacts observed within Locus 5 include 13 cryptocrystalline silicate chert flakes (four primary, five secondary, four tertiary) and one quartz hammerstone.

Locus 6 is located 88 meters northeast of Locus 5. Locus 6 measures six meters north to south by two meters east to west. Artifacts observed within Locus 6 include 37 metavolcanic flakes (17 primary, 14 secondary, six tertiary) and one green metavolcanic core tool.

Locus 7 is located 16 meters northeast of Locus 6. Locus 7 measures seven meters north to south by five meters east to west. Artifacts observed within Locus 7 include seven metavolcanic flakes (six primary, one secondary) and one metavolcanic tested cobble.

Locus 8 is located 34 meters northeast of Locus 7. Locus 8 measures three meters north to south by three meters east to west. Artifacts observed within Locus 8 include eight metavolcanic flakes (four primary, one secondary, three tertiary) and two metavolcanic bidirectional cores.

Locus 9 is located three meters northeast of Locus 6. Locus 9 measures two meters north to south by 1 meter east to west. Artifacts observed within Locus 9 include seven metavolcanic flakes (three primary, four secondary) and one metavolcanic uni-directional core tool.

No artifacts were observed outside the loci. The further character of artifacts associated with JM-042 is unreported.

The more particular physical context for JM-042, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007); therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature; debitage consists primarily of primary and secondary flakes with unifacial cores, core tools, angular waste/shatter, and a hammerstone. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of three primary stone materials (green metavolcanic, quartz, and cryptocrystalline silicate) that are constituents of the surrounding area, and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least nine single reduction localities or episodes; but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction; and analysis of artifact distribution has been accounted for during the recordation process. This geomorphic landform indicates a Pleistocene (or older) period of formation, and because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits; therefore, data potential is considered exhausted through recordation of JM-042.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, JM-042 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

JMR-004

JMR-004 is an oval-shaped, fire-altered rock feature and a single prehistoric core that covers a total surface area of 14 square meters. The site is located within the southeastern portion of the 450 MW area of the Proposed IVS Project. The site is situated within the fan piedmont remnant geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of well developed, intact pavement comprised of small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils at this site contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include: creosote, burrowbush, bunch grass, and desert trumpet.

This site measures five meters northwest to southeast by five meters northeast to southwest and contains a total of one feature and one prehistoric artifact. The prevailing cultural constituents within this site consist of a cluster of fire-affected rock interpreted to be a hearth feature, and a single uni-directional core. Artifact density at JMR-004 is low, with a calculated distribution of one artifact per 14 square meters. The overall condition of the site is good with no visible alterations.

Feature 1 is a fire affect rock/deflated hearth feature that is partially disarticulated but retains a rough circular pattern. Feature 1 measures approximately five meters northwest to southeast by five meters northeast to southwest. It is comprised of over 40 small granitic and metavolcanic cobbles, which measure five centimeters to eight centimeters in diameter and show evidence of being fire-affected. A single green cryptocrystalline silicate unidirectional core was observed in association with Feature 1. The further character of artifacts associated with Feature 1 is unreported.

The more particular physical context for JMR-004, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be a very old fan surface within the fan piedmont remnant land form. The fan piedmont remnant land form is an isolated exposure surrounded by the fan apron land form that has been determined to have the same geomorphological characteristics as the fan piedmont (URS 2009:CUL-6). The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007); therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret the presence of a hearth feature or fire-affected rock as evidence of resource processing and/or other activities. Hearth features found in association with lithic debitage could be evidence of more complex lithic resource processing activities. Lithic materials intended for flaked tool production were sometimes heat treated using open hearths in order to improve the flaking characteristics of the stone. Additionally, open hearths were used in prehistory for various other purposes such as parching seeds and grains, cooking, and to provide personal warmth. Such features may also represent sacred/ritualistic activities associated with cremating the deceased and/or animals. The conspicuous absence of any evidence of carbon residue and the paucity of artifacts would support the hypothesis that JM-004 is a surface phenomenon that likely resulted from a single episode of use.

This site cannot reliably be associated with any distinctive or significant event, person, design, or construction; and analysis of artifact distribution has been accounted for during the recordation process. JMR-004 is situated atop a subordinate landform characterized as a very old fan surface within the fan piedmont remnant landform. The fan piedmont remnant landform is an isolated exposure surrounded by the fan apron landform that has been determined to have the same geomorphological characteristics as the fan piedmont (URS 2009: CUL-6). In addition, there is no visible charcoal or staining on the surface, so no carbon-14 sample can be extracted for chronometric dating, given the high deflation rate of the hearth situated atop the piedmont remnant removes subsurface potential. This geomorphic landform indicates a Pleistocene (or older) period of formation, and because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits; therefore, data potential is considered exhausted through recordation of JMR-004.

As a result, JMR-004 is recommended not eligible for the National Register and is not a historical resource pursuant to National Register and California Register under any of the criteria for eligibility. In addition, JMR-004 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

JMR-008

JMR-008 is a circular-shaped prehistoric lithic scatter that covers a total surface area of 2.62 square meters. The site is located within the south central portion of the 450 MW area of the Proposed IVS Project. The site is situated within the fan piedmont remnant geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of intact desert pavement that is well developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote and bunch grass.

This lithic scatter site measures 3 meters east to west by 1 meters north to south, and contains a total of 16 prehistoric artifacts. The prevailing cultural constituents within this site consist of lithic reduction debitage. Artifact density at JMR-008 is low, with a calculated distribution of one artifact per 0.19 square meters. The overall condition of the site is good.

The artifact types and materials present at the site include: 14 quartz flakes (four primary, seven secondary and three tertiary), one uni-directional quartz core and one bi-directional quartz core. The further character of artifacts associated with JMR-008 is unreported.

The more particular physical context for JMR-008, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be a very old fan surface mantled by a younger fan apron within the fan piedmont remnant landform. The fan piedmont remnant land form is an isolated exposure surrounded by the fan apron landform that has been determined to have the same geomorphological characteristics as the fan piedmont (URS 2009: CUL-6). The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for Early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007); therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont. However, areas of active erosion, such as the younger fan where this site is located, do have a slightly greater potential for the presence of subsurface deposits where recent alluvium has been deposited. Given the highly erosive nature of the fan piedmont remnant landform, it seems unlikely that such subsurface deposits would have been preserved. Furthermore, if subsurface cultural deposits were to be preserved under such isolated inset pediments, they will most likely be similar in quality and quantity of artifacts to those sites found on the surface in nearby remnant portions of the fan piedmont (URS 2009: CUL-8).

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists primarily of secondary flakes and cores. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone quartz material that is a constituent of the surrounding area, and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent one single reduction locality or episode. It should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction; and analysis of artifact distribution has been accounted for during the recordation process. JMR-008 is situated atop a subordinate landform characterized as a very old fan surface mantled by a younger fan apron within the fan piedmont remnant landform. This geomorphic landform indicates a Pleistocene (or older) period of formation, and because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits. The presence of a younger fan such as where this site is located increases that likelihood slightly. If shallowly buried archaeological deposits are present, it is unlikely that they would have been preserved; therefore, data potential is considered exhausted through recordation of JMR-008.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, JMR-008 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

JMR-012

JMR-012 is an oblong-shaped lithic scatter that covers a total surface area of 59 square meters. The site is located within the south central portion of the 450 MW area of the Proposed IVS Project. The site is situated within the fan piedmont remnant geomorphic landform, cut through by a gully/active wash, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of intact desert pavement that is well developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote.

This lithic scatter site measures 22 meters northeast to southwest by 4 meters northwest to southeast, and contains a total of 42 prehistoric artifacts. It consists of one concentration interpreted to be a single reduction locus, with 41 artifacts and one additional artifact observed outside the locus. The prevailing cultural constituents within this site consist of prehistoric artifacts. Artifact density at JMR-0 12 is low, with a calculated distribution of one artifact per 1.4 square meters. The overall condition of the site is fair due to off-highway vehicle tracks running in a north to south direction, located 10 meters north.

The artifact types and materials present at the site include 41 quartz flakes (seven primary, 17 secondary, 17 tertiary) and one unifacially retouched edge modified quartz flake.

Locus 1 is located in the northeast portion of the site and measures three meters east to west by two meters north to south. Artifacts observed within Locus 1 include 41 quartz flakes (seven primary, 17 secondary and 17 tertiary).Those artifacts observed within 30 meters and outside of the locus consists of one unifacially retouched edge modified quartz flake. The further character of artifacts within JMR-012 is unreported.

The more particular physical context for JMR-012, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont remnant landform. The fan piedmont remnant land form is an isolated exposure surrounded by the fan apron landform that has been determined to have the same geomorphological characteristics as the fan piedmont (URS 2009: CUL-6). The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature; debitage consists primarily of secondary and tertiary flakes. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the lithic materials reduced in JMR-012 are of the same primary stone (quartz) material that is a constituent of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent a single reduction localities or episodes. It should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

The presence of flaked stone tools such as the unifacially retouched flake found within JMR-012 represents resource procurement and/or processing of faunal or floral resources. The creation of flaked stone tools requires additional lithic technologies, possible including bifacial thinning and pressure flaking to shape and refine cutting edges, but this particular tool was expediently produced such that it is likely little time was spent modifying it to increase its efficiency.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. JMR-012 is situated atop a subordinate landform characterized as a very old fan surface within the fan piedmont remnant landform. The fan piedmont remnant landform is an isolated exposure surrounded by the fan apron land form that has been determined to have the same geomorphological characteristics as the fan piedmont (URS 2009: CUL-6). This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits, therefore data potential is considered exhausted through recordation of JMR-012.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, JMR-012 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

LL-018

LL-018 is an amorphous-shaped lithic scatter that covers a total surface of 200 square meters. The site is located within the eastern portion 450 MW area of the Proposed IVS Project. The site is situated within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation (URS 2009). Most of the site is on older fan remnant with a small portion of the site being located on recent alluvium within an active wash. The portions of the site that are on older fan surfaces are covered by intact desert pavement that is well developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. The portions of the site which are located on the active wash have no desert pavement. Vegetation species on the site include creosote, bunch grass and mesquite.

This lithic scatter site measures 31 meters north to south by 26 meters east to west, and contains a total of 26 prehistoric artifacts. It consists of three concentrations interpreted to be lithic scatters, containing 21 artifacts and five additional artifacts observed outside the loci. The prevailing cultural constituents within this site consist of prehistoric lithic debitage. Artifact density at LL-018 is low, with a calculated distribution of one artifact per eight square meters. The overall condition of the site is good, with minor alterations from wash/road on the western edge of the site and evidence of modern human activity on site.

The site contains three lithic scatters and a total of 26 artifacts, which include: eight quartz flakes (seven secondary and one tertiary), 14 cryptocrystalline silicate chert flakes (one primary, six secondary and seven tertiary), two cryptocrystalline silicate chert cores and one quartzite secondary flake.

Locus 1 is located in the southwestern portion of the site and measures one meter north to south by one meter east to west. Artifacts observed within Locus 1 include three quartzite secondary flakes and one unidirectional cryptocrystalline silicate gray chert core.

Locus 2 is located 14 meters northeast of Locus 1, and measures one meter north to south by one meter east to west. Artifacts observed within Locus 2 include four quartz flakes (three secondary and one tertiary).

Locus 3 is located seven meters northeast of Locus 2 and measures one meter north to south by three meters east to west. Artifacts observed within Locus 3 include 12 cryptocrystalline silicate chert flakes (five secondary and seven tertiary) and one quartzite secondary flake.

Those artifacts observed within 30 meters and outside the loci consist of two cryptocrystalline silicate chert flakes (one primary and one secondary), one green cryptocrystalline silicate chert scraper, one gray cryptocrystalline silicate chert core and one quartz secondary flake. The further character of artifacts found within LL-018 is unreported.

The more particular physical context for LL-018, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, the majority of the site appears to be on an older fan surface within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. The surface consists of finer grain material eroded from the fan piedmont that has formed a number of fan "aprons," which do not individually fully cover the entire area, and which interfinger and partially bury one another and piedmont remnants. The lack of soil development within the capped alluvial unit, and the similar degree of pavement development between the two units suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time; thus reducing the potential for extensive buried archaeological deposits.

Nonetheless, this area does demonstrate the potential for (shallowly) buried preserved surfaces, but there is a high likelihood these deposits will represent the same constituents recorded on the surface. As a result there is a very low to moderate likelihood for subsurface deposition. The western margin of the site has been cut through by an ephemeral wash. Areas of active erosion such as this do have a slightly greater potential for the presence of subsurface deposits such as would occur where recent alluvium was deposited. Given the highly erosive nature of active and ephemeral washes, it seems unlikely that such subsurface deposits within those contexts would have been preserved. The desert pavement for the majority of the site is intact and well-developed, consisting of small to large, sub-rounded to sub-angular metavolcanic, basalt, quartz, quartzite and granite gravels and cobbles overlaying coarse sands and fine gravels. The western margin of the site is composed of recent alluvium with no desert pavement present.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists primarily secondary and tertiary flakes with three chert cores. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the two primary stone materials (chert and quartz) that are constituents of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least two single reduction localities or episodes. It should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. LL-018 is located within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. The lack of soil development within the capped alluvial unit suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time, thus reducing the potential for extensive buried archaeological deposits. The western margin of this site extends into an ephemeral wash. As a result, there is a very low to moderate likelihood for subsurface deposition. Nonetheless, though this area does demonstrate some potential for (shallowly) buried preserved surfaces, there is a high likelihood these deposits will represent the same constituents recorded on the surface, or the context of the artifacts is likely to be disturbed. Therefore, due to the low density of artifacts and low probability for significant subsurface artifacts, the data potential for this site is considered exhausted through recordation.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, LL-018 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

LL-019

LL-019 is an oval-shaped prehistoric lithic scatter site that covers a total surface of 11,417 square meters. The site is located within the eastern portion of the 450 MW area of the Proposed IVS Project. The site is situated within the fan piedmont remnant geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of disturbed desert pavement with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote and burrobush.

This lithic scatter site measures 150 meters east to west by 98 meters north to south, and contains a total of 200 prehistoric artifacts. It consists of two rock cluster features and four concentrations interpreted to be three single reduction loci and one lithic scatter locus with 160 artifacts. There were an additional seven artifacts associated with Feature 1 and another 33 artifacts observed outside the loci and features. The prevailing cultural constituents within this site consist of prehistoric artifacts and features. Artifact density at LL-019 is low, with a calculated distribution of one artifact per 57 square meters. The overall condition of the site is fair with disturbances caused by off road vehicle tracks.

Artifact types and materials present at the site include: 112 metavolcanic flakes (31 primary, 45 secondary, 36 tertiary), eight metavolcanic cores (two uni-directional, two multi-directional); 62 quartz flakes (33 primary, 23 secondary, six tertiary), two tested cobbles, five uni-directional quartz cores, and one quartzite hammerstone; seven cryptocrystalline silicate brown chert flakes (three primary, four secondary), one chert core, tested cobble, as well as one cryptocrystalline silicate chalcedony primary flake.

Feature 1 is located in the southwest corner of the site boundary. Feature 1 consists of a prehistoric rock cluster measuring one meter north to south by two meters east to west by 0.25 meters high and is constructed of approximately 50 angular rocks of metavolcanic material. Artifacts associated with this feature consist of one chalcedony primary flake and six quartz flakes (two primary, four secondary).

Feature 2 is located 59 meters north of Feature 1 within Locus 2. Feature 2 consists of a prehistoric rock cluster measuring two meters north to south by one meter east to west by 28 centimeters high and is constructed of approximately 50 angular rocks of metavolcanic material. Artifacts associated with this feature consist of sparse concentrations of metavolcanic and quartzite flakes.

Locus 1 is located 45 meters north from Feature 1 and measures three meters north to south by three meters east to west. Artifacts observed within Locus 1 include 23 green metavolcanic flakes (six primary, 13 secondary, four tertiary).

Locus 2 is located 20 meters northwest of Locus 1 and measures eight meters north to south by 17 meters east to west. Artifacts observed within Locus 2 include: 37 total artifacts consisting of eight green metavolcanic flakes (five primary, three tertiary), 25 quartz flakes (11 primary, eight secondary, six tertiary), three uni-directional quartz cores and one uni-directional metavolcanic core.

Locus 3 is located nine meters east of Locus 2 and measures six meters east to west by three meters north to south. Artifacts observed within Locus 3 include: 28 total artifacts consisting of 14 green metavolcanic flakes (four primary, four secondary, six tertiary), five quartz flakes (four primary, one secondary), six brown chert flakes (three primary and three secondary), one green metavolcanic multi-directional core, one brown chert uni-directional core and one quartz hammerstone.

Locus 4 is located 45 meters west of Locus 3 and measures 11 meters north to south by 10 meters east to west. Artifacts observed within Locus 4 include: 72 total artifacts consisting of 47 green metavolcanic flakes (five primary, 22 secondary, 20 tertiary), eight black metavolcanic flakes (two primary, five secondary, one tertiary), 14 quartz flakes (7 primary, 7 secondary), two green metavolcanic multi-directional cores and one green metavolcanic uni-directional core.

Those artifacts observed outside the loci consist of 33 artifacts including 12 green metavolcanic flakes (nine primary, one secondary, two tertiary), 12 quartzite flakes (nine primary, three secondary), one cryptocrystalline silicate chert secondary flake, three metavolcanic cores, two quartzite cores, two quartz tested cobbles and one chert tested cobble. The further character of artifacts associated with LL-019 is unreported.

The more particular physical context for LL-019, extrapolating information from Data Response 112 Figure 4 (URS 2009), to the location of the site, appears to be a very old fan surface within the fan piedmont remnant landform. The fan piedmont remnant landform is an isolated exposure surrounded by the fan apron landform that has been determined to have the same geomorphological characteristics as the fan piedmont (URS 2009:CUL-6). The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists primarily of primary, secondary, and tertiary flakes, cores, and a single hammerstone. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic reduction site are of the same primary stone materials (metavolcanic, quartz, and cryptocrystalline silicate) that are constituents of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least three single reduction localities or episodes and one lithic scatter, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Also present at LL-019 are two rock cluster features. Though neither cluster has any temporally diagnostic characteristics, evidence seems to support the hypothesis that they are prehistoric in age. Both clusters are spatially associated with lithic debitage and both clusters are predominantly made up of the same stone material (metavolcanic) that also predominates in the greater artifact assemblage at EBR-019. Therefore, it seems likely that the two rock cluster features present at EBR-019 are localities where lithic raw material was collected in order to increase the efficiency of stone tool manufacture.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. LL-019 is situated atop a subordinate landform characterized as a very old fan surface within the fan piedmont remnant landform. The fan piedmont remnant land form is an isolated exposure surrounded by the fan apron landform that has been determined to have the same geomorphological characteristics as the fan piedmont (URS 2009: CUL-6). This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits. Therefore data potential is considered exhausted through recordation of LL-019.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, LL-019 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

RAN-005

RAN-005 is a triangular-shaped historic site containing a US General Land Office (GLO) survey benchmark that covers a total surface of 145 square meters. The site is located within the northwest portion of the 450 MW area of the Proposed IVS Project. The site is within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site largely consists of alluvial sediments bound to the east and west by intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote, desert trumpet and bunch grass.

This historic site measures 26 meters north to south by 11 meters east to west, and contains a total of one historic artifact and one historic feature. The prevailing cultural constituents within this site consist of a single historic artifact and a single historic feature. Artifact density at RAN-005 is low, with a calculated distribution of one artifact per 72.2 square meters. The overall condition of the site is good.

The site contains a single historic feature and one historic artifact. The historic artifact is located approximately 25 meters north of the feature and is a tobacco can made of ferrous metal with a curved base shape and no diagnostic marks. The base of the tobacco can measures three inches by one inch. Modern wooden lathe stake fragments and bailing wire were also observed. The further character of the artifacts associated with RAN-005 is unreported.

Feature 1 is a United State General Land Office corner section benchmark. It consists of a single metal pipe extending vertically from the ground surface approximately one foot and topped with a brass cap that measures 3.5 inches in diameter. The brass cap is stamped with the words, "US GENERAL LAND OFFICE SURVEY 1912", "PENALTY $250 FOR REMOVAL", "T16S"," R10E", "S12/S13", "R11E" and "S17/S18".

The more particular physical context for RAN-005, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Because the surface of the site is situated within the fan piedmont and consists of a single episode of installing a US GLO benchmark there is a very low likelihood for subsurface deposition.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret that General Land Office cadastral benchmarks such as the one found in RAN-005 were placed by surveyors as a part of the Public Lands Survey System (PLSS). That system divided public lands into sections of one square mile (640 acres) and into quarter sections of 160 acres. The PLSS was created by the Land Ordinance of 1785, which declared that lands outside the then-existing states could not be sold, otherwise distributed, or opened for settlement prior to being surveyed (Stewart 1935). Along with the Homestead Act of 1862 and the Desert Land Act of 1877, the PLSS helped facilitate the U.S. expansion westward in the late 19th and early 20th centuries. Destruction is still prohibited under federal law; therefore, it is recommended that the US GLO benchmark be left undisturbed during construction activities.

The single upright oval-shaped tobacco can present shows no temporally diagnostic characteristics. Such cans began being manufactured around 1913 and continued into production until at least 1988 when R.J. Reynolds abandoned tin packaging in favor of paper pouches (Rock 1988).

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. Therefore, data potential is considered exhausted through recordation of RAN-005.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, RAN-005 is not considered a contributor to an existing and/or proposed archaeological district or landscape. However, destruction of US GLO benchmarks is still prohibited by law and therefore it is recommended that this benchmark be left undisturbed.

RAN-006

RAN-006 is an oblong-shaped historic refuse deposit site that covers a total surface area of 1,300 square meters. The site is located within the northwest portion of the 450 MW area of the Proposed IVS Project. The site is situated within an active gully (wash) surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of disturbed desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles. Vegetation on the site include creosote and bunch grass.

This historic refuse deposit site measures 70 meters east to west by 38 meters north to south, and contains a total of 113 historic artifacts. It consists of one concentration interpreted to be one locus, with 44 artifacts plus 69 additional artifacts observed outside the locus. The prevailing cultural constituents within this site consist of historic artifacts. Artifact density at RAN-006 is low, with a calculated distribution of one artifact per 40.63 square meters. The overall condition of the site is fair.

This site contains a total of 113 historic artifacts, which includes: 21 historic cans (one Eastside cone top beer, 17 church key, one roll top and two sanitary food), 23 colorless glass fragments, two colorless "White Magic" bottle fragments (one base and one top), 52 brown Owens-Illinois Duraglas bottle fragments (including base and neck), two aqua bottle fragments (base and neck), one colorless coke bottle base from El Centro California, one colorless Parsons Ammonia bottle base, 17 colorless "Double Cola" bottle glass fragments, and one braided cable. Also noted, but not included in the total artifact count, are three modern pull tab cans.

Locus 1 is located at the head of an ephemeral gully immediately adjacent to the wash near the southern central boundary of the site and measures 14 meters north to south by seven meters east to west. Artifacts observed within Locus 1 include: 15 historic cans (13 church key-opened cans and two sanitary food tins) and 29 colorless glass fragments of one or more bottles (including a "White Magic" bottle base and neck). Three modern "Budweiser" pull tab cans are also noted within Locus 1.

Those artifacts observed within 30 meters, outside of the loci and feature consist of two historic beverage cans (one Eastside cone top beer can and one roll top can), 66 glass fragments belonging to an estimated minimum of six bottles (including one brown Owens-Illinois Duraglas bottle base and neck, one colorless "Parsons Ammonia" bottle base, one "Coca-Cola" bottle base and associated fragments embossed with "El Centro, CA", 15 fragments from two "Double Cola" 16 oz. bottles with a red and white applied color label and one aqua bottle base and neck), and one braided cable (0.75 inch diameter by approximately 20 inches in length).

The more particular physical context for RAN-006, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be within an active wash surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont. Areas of active erosion within the fan piedmont, such as where this site is located, do have a slightly greater potential for the presence of subsurface deposits such as would occur where recent alluvium was deposited. Given the highly erosive nature of the fan piedmont it seems unlikely that such subsurface deposits would have been preserved. Furthermore, if subsurface cultural deposits were to be preserved under such isolated inset pediments, they will most likely be similar in quality and quantity of artifacts to those sites found on the surface in nearby remnant portions of the fan piedmont (URS 2009: CUL-8).

Specific maker's marks found on artifacts at RAN-006 include two "Double Cola" clear glass bottles with a red and white applied color label and a "Parsons Ammonia" bottle base manufactured by the Owens-Illinois Glass Company post-1954. A brown Duraglas bottle base and neck also manufactured by Owens-Illinois dates from 1940 to 1971. A "White Magic" bleach bottle base and neck manufactured by Glass Containers dates from 1945 to 1971 (Goodman 2002). Cone top beer cans such as the one present at RAN-006 were first introduced in 1935 and continued being produced into the 1950s (Goodman 2002).

Deposits of historic artifacts, such as the one found at RAN-006, typically represent episodes of refuse disposal and/or loss of individual articles in situ. In the case of RAN-006, the relatively large number of artifact types present would more likely have resulted from dumping of a wide range of artifact types that would be expected in an assemblage of common household refuse rather than in-situ disposal. Though approximate dates of manufacture can be determined for some of the artifacts present at RAN-006, the time between the initial use/consumption of the artifacts and their ultimate disposal cannot be known so the specific date of their disposal cannot be reliably determined. Based on the datable material it is plausible that this historic refuse deposit date between the 1940s and 1950s.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. RAN-006 is situated within an active wash within the fan piedmont. This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area there is very low likelihood for subsurface archaeological deposits. Areas of active erosion within the fan piedmont such as where this site is located do have a slightly greater potential for the presence of subsurface archaeological deposits such as might occur where recent alluvium was deposited. Given the highly erosive nature of active washes within the fan piedmont, it seems unlikely that such subsurface deposits would have been preserved. Furthermore, if subsurface cultural deposits were to be preserved under such isolated inset pediments, they will most likely be similar in quality and quantity of artifacts to those sites found on the surface in nearby remnant portions of the fan piedmont (URS 2009:CUL-8). Therefore, data potential is considered exhausted through recordation of RAN-006.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, RAN-006 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

RAN-008

RAN-008 is an historic oblong-shaped site containing a US General Land Office (GLO) benchmark feature that covers a total surface of 17.5 square meters. The site is located within the western portion of the 450 MW area of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands composed of decomposed metavolcanic and granitic gravels and cobbles. No vegetation species were observed on the site.

This site measures six meters east to west by four meters north to south, and contains one feature with no associated historic artifacts. Also present are three modern lathe stakes. The overall condition of the site is fair due to alterations by off highway vehicle tracks.

Feature 1 is a United States Government Land Office survey quarter benchmark. It is a single metal pipe that extends vertically 6.5 inches from the ground surface and is topped with a brass cap that measures 1.5 inches in diameter. The brass cap is stamped with the words, "US GENERAL LAND OFFICE SURVEY 19__", "PENALTY $250 FOR REMOVAL", and "1/4 S14/S13". The further character of artifacts associated with Feature 1 is unreported.

The more particular physical context for RAN-008, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009).

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret that General Land Office cadastral benchmarks such as the one found in RAN-008 were placed by surveyors as a part of the Public Lands Survey System (PLSS). That system divided public lands into sections of one square mile (640 acres) and into quarter sections of 160 acres. The PLSS was created by the Land Ordinance of 1785, which declared that lands outside the then-existing states could not be sold, otherwise distributed, or opened for settlement prior to being surveyed (Stewart 1935). Along with the Homestead Act of 1862 and the Desert Land Act of 1877, the PLSS helped facilitate the U.S. expansion westward in the late 19th and early 20th centuries. The date stamp on this benchmark was left blank. Based on observations of similar benchmarks in the project area that are dated 1912, it seems likely that this benchmark was placed during that same survey effort and therefore also dates back to 1912.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. RAN-008 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform and historic feature (single episode activity) have a very low likelihood for subsurface archaeological deposits, therefore data potential is considered exhausted through recordation of RAN-008.

As a result, this site as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, RAN-008 is not considered a contributor to an existing and/or proposed archaeological district or landscape. However, destruction of US GLO benchmarks is prohibited by law and therefore it is recommended that this benchmark be left undisturbed.

RAN-012

RAN-012 is an amorphous-shaped archaeological deposit that includes both prehistoric and historic components and covers a total surface of 1,569 square meters. The site is located within the northwestern portion of the 450 MW area of the Proposed IVS Project. The site is situated within an active wash surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of an east facing slope of a dissected fan piedmont covered by intact desert pavement that is heavily disturbed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote and salt bush.

This archaeological deposit measures 53 meters north to south by 88 meters east to west and contains a total of 229 prehistoric and seven historic artifacts. The prehistoric component consists of three concentrations interpreted to be three single reduction loci, with 42 artifacts and 187 additional prehistoric artifacts observed outside the loci, including ceramic sherds, which are interpreted to be flaked stone and ceramic scatters. The historic component consists of six rock cluster features and seven historic/modern artifacts interpreted to be historic period refuse discard and mining/clearing push piles. The prevailing cultural constituents within this site consist of prehistoric artifacts. Artifact density at RAN-012 is low, with a calculated distribution of one artifact per 7.44 square meters. The overall condition of the site is fair; additionally, the site is eroding downslope into a large ephemeral gully that runs through the south margin of the site.

The artifact types and materials present at RAN-012 include 153 metavolcanic flakes (55 primary, 49 secondary and 49 tertiary), five red rhyolite flakes (three secondary and two tertiary), four tertiary cryptocrystalline silicate flakes, two primary chert flakes, nine quartzite flakes (four primary, two secondary and three tertiary), twelve quartz flakes (six primary, three secondary and three tertiary), nine basalt flakes (four primary and five secondary), eleven metavolcanic cores, one cryptocrystalline silicate core, two quartzite cores, four quartz cores, one basalt core, one petrified wood core, one unspecified material core, six metavolcanic tested cobbles, one quartzite tested cobble, one quartz tested cobble, one basalt tested cobble and five Colorado buffware (fire affected) body sherds. Also present were seven historic/modern artifacts, including one oil can, one aluminum pull tab beer can, one unidentified metal can body fragment, two pieces of weathered cut large mammal bone, one modern continuous thread "Budweiser" brown glass bottle and one bullet casing.

Feature 1 is a pile of small white quartz pebbles located in the western part of the central portion of the site approximately 30 meters away from a sandy wash. Feature 1 measures one meter north to south by two meters east to west and is partially deflated. The feature is comprised of approximately 100 sub-rounded to sub-angular weathered quartz pebbles that range between three centimeters and 10 centimeters in size and contains one green metavolcanic secondary flake.

Feature 2 is a low cluster of rounded to sub-angular pebbles that measures one meter north to south by one meter east to west and is located 48 meters east of

Feature 1. Feature 2 is made up of approximately 60 pebbles that range in size from nine centimeters to 15 centimeters. Feature 2 is located near the northern boundary of the site and appears to be related to gravel mining.

Feature 3 is a cluster of cobbles that measures approximately two meters north to south by one meter east to west by 15 centimeters high and is located 56 meters south of Feature 2. Feature 3 is made up of approximately 60 pebbles that range in size from nine centimeters to 15 centimeters.

Feature 4 is a pile of cobbles that have been widely scattered. Feature 4 measures approximately two meters north to south by two meters east to west and is located four meters south of Feature 3.

Feature 5 is a cluster of cobbles that measures approximately one meter in diameter and is located five meters south of Feature 4. Feature 5 is roughly circular in plan and is made up of approximately 60 pebbles that range in size from nine centimeters to 15 centimeters.

Feature 6 is a scatter of sub-angular to sub-rounded quartz pebbles that measures approximately two meters north to south by two meters east to west and is located 82 meters east of Feature 5. The scatter is made up of approximately 100 pebbles that range in size from two centimeters to seven centimeters.

Locus 1 is 27 meters is located in the southwestern portion of the site and measures 90 centimeters north to south by 50 centimeters east to west. Artifacts observed within Locus 1 include: six gray metavolcanic flakes (four primary, one secondary and one tertiary) and one unidirectional core.

Locus 2 is located 29 meters northeast of Locus 1 and measures three meters east to west by two meters north to south. Artifacts observed within Locus 2 include: 26 green metavolcanic flakes (5 primary, 6 secondary and 15 tertiary) and one red rhyolite tertiary flake.

Locus 3 is located 23 meters southwest of Locus 2 and measures two meters northeast to southwest by 40 centimeters northwest to southeast. Locus 3 has a total of eight green metavolcanic flakes (three primary, one secondary and 4 tertiary).

Those artifacts observed outside the loci and within 30 meters consist of 187 prehistoric artifacts and seven historic/modern artifacts including 113 metavolcanic flakes (43 primary, 41 secondary and 29 tertiary), four red rhyolite flakes (three secondary and one tertiary), four tertiary cryptocrystalline silicate, two primary chert flakes, nine quartzite flakes (four primary, two secondary and three tertiary), twelve quartz flakes (six primary, three secondary and three tertiary), nine basalt flakes (four primary and five secondary), eleven metavolcanic cores, one cryptocrystalline silicate core, two quartzite cores, four quartz cores, one basalt core, one petrified wood core, six metavolcanic tested cobbles, one quartzite tested cobble, one quartz tested cobble, one basalt tested cobble and five Colorado buffware (fire affected) body sherds. Potentially modern artifacts include one oil can, one aluminum pull tab beer can, one unidentified metal can body fragment, two pieces of weathered cut large mammal bone, one modern continuous thread

"Budweiser" brown glass bottle and one bullet casing. The further character of artifacts associated with RAN-012 is unreported.

The more particular physical context for RAN-012, extrapolating information from Data Response 112 Figure 4 (URS 2009), to the location of the site, appears to be along the slope of a large erosional gully (active wash) surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and redeposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont. Areas of active erosion within the fan piedmont, such as where this site is located, do have a slightly greater potential for the presence of subsurface deposits such as would occur where recent alluvium was deposited. Given the highly erosive nature of the fan piedmont it seems unlikely that such subsurface deposits would have been preserved. Furthermore, if subsurface cultural deposits were to be preserved under such isolated inset pediments, they will most likely be similar in quality and quantity of artifacts to those sites found on the surface in nearby remnant portions of the fan piedmont (URS 2009: CUL-8).

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret the lithic component of this site primarily as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists of primary, secondary and tertiary flakes, cores and hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this site are of the same primary stone material (metavolcanic), that is a constituent of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least three single reduction localities or episodes, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

The presence of flaked stone tools (two edge modified flakes) within RAN-012 represents resource procurement and/or processing of faunal or floral resources. The creation of flaked stone tools requires additional lithic technologies, possibly including bifacial thinning and pressure flaking to shape and refine cutting edges. Additionally, there is one core tool and one utilized flake present, which would have been expedient tools, with little energy spent on them to modify their forms for greater effectiveness.

Ceramic sherds such as the five Colorado buffware found at this site result from the accidental or intentional fracture of a ceramic vessel. Analysis of artifacts such as these may have the potential to provide data pertinent to research questions regarding prehistoric ceramic production technology, and/or the regional ceramic ware information.

The presence of ceramics indicates a Late Prehistoric era site. Currently, the primary ethnic groups known to have occupied region surrounding RAN-012 include the Diegueño and Kamia. Other groups known to have used/traveled/inhabited the area include the Tipai, Cocopa, Kumeyaay, Ipai, Quechan, Paipai and Cahuilla (Luomala 1978; Schaefer and Laylander 2007; URS 2009). In approximately AD 1200, the course of the Colorado River changed, refilling Lake Cahuilla and providing a stable water source that drew people from surrounding regions to repopulate the Colorado Desert. Ceramic wares which were introduced centuries before in other areas were brought into this region at that time (URS 2009). However, it has been argued that stable populations around the lake developed their own distinctive pottery formulas that became regional expressions of their families and locales (May ND). Although these groups each had specific approaches to the creation of ceramics, ceramic vessels were also traded along with subsistence resources and other items, infusing some uncertainty into the use of data from ceramics to associate one particular area with a particular tribal group or family (May ND). Therefore, it is unlikely that surface data could directly relate RAN-012 or the area surrounding it, to a particular tribe.

Data gathered on ceramics in the area surrounding RAN-012 shows evidence of a variety of ceramic types and techniques. Though paddle-and-anvil construction techniques were common among groups using this area, the tempers employed, vessel types manufactured, and decoration did vary between groups. The Diegueño used ground clay and did not add temper when manufacturing ceramics. They created a variety of vessels including ollas; bowls, cooking pots, and pipes (Rogers 1973:18; URS 2009). The Kamia sometimes added rose quartz as temper and produced the greatest variety of ceramics among the Yuman bands, including ollas, jars, canteens, bowls, rattles, plates, scoops, cups, and parchers. Kamia ceramics were painted after firing with red and/or black designs (Gifford 193; Rogers 1973; URS 2009; Van Camp 1979:57). The Cocopah used ground and winnowed clay tempered with ground sherds to create a variety of vessels used for storage and cooking (Alvarez de Williams 1983:99; URS 2009). Quechan vessel types include bowls, parchers, cooking pots, small figurines, and large storage vessels that were used to float goods across rivers (Bee 1983:10; McGuire 1982; URS 2009).

The rock clusters present (Features 1 through 6) are somewhat anomalous. None of the features have any characteristics or associated artifacts that could provide evidence of their antiquity or lack thereof, therefore; they cannot be definitively associated with the prehistoric, historic or modern eras. It also seems unlikely that the features contains cultural materials, given the structure of the rock clusters (size-sorted stones that have become tightly packed and evidence of sand accumulation/deposition amongst stones).

Features 2 through 5 all appear to be similar, in that they are made up of stones that are of similar size and materials. The general appearance of the clusters seems consistent with that which would be expected, if they were remainder piles left over from small-scale gravel mining and sorting operations. The desert pavement on the surface of the site appears to have been disturbed in the past by mechanical scraping, which would support that hypothesis. The features present show no discernable alignment or intentional spatial relationship to each other so it seems unlikely that they are prehistoric trail markers or resulted from ritual practices. Native American monitors Clint Linton and Gabe Kitchen were present on site and voiced agreement.

Features 1 and 6 are similar to each other in that the majority of stones of which they are comprised are small quartz stones or pebbles. The uniformity of the materials employed seems to reflect intentional selection but no additional evidence was noted to allow the discernment of that original intention. Clint Linton and Gabe Kitchen, the Native American monitors present, gave no opinion regarding possible interpretations of these two features.

It may be important to note that off-highway vehicle trails are present along the eastern edge of the site, so it is possible that some or all of the rock clusters present at this site could have once served to mark the course.

Archaeologists for the applicant interpret that deposits of historic or potentially modern artifacts, such as the ones found at RAN-0 12, typically represent episodes of refuse disposal/discard and/or loss of individual articles in-situ. In the case of RAN-012, the small number of historic artifacts and artifact types present would more likely have resulted from in-situ disposal rather than dumping. Though precise dates of manufacture cannot be determined for the artifacts present at RAN-012, temporally diagnostic refuse artifacts present at RAN-012 (such as an aluminum pull-top can and a continuous thread finish Budweiser beer bottle) have modern characteristics.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, with the exception of the ceramics (discussed below), the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction and analysis of artifact distribution has been accounted for during the recordation process. RAN-012 is situated within an active wash within the fan piedmont. This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area there is very low likelihood for subsurface archaeological deposits. Areas of active erosion within the fan piedmont such as where this site is located do have a slightly greater potential for the presence of subsurface archaeological deposits such as might occur where recent alluvium was deposited. Given the highly erosive nature of active washes within the fan piedmont, it seems unlikely that such subsurface deposits would have been preserved. Regardless, because there remains a slight possibility that subsurface deposits may have become buried by recent alluvium within the wash due to erosional processes, and given the presence of temporally diagnostic artifacts limited subsurface testing is recommended for this site.

Ceramics present at RAN-012 could provide additional data pertinent to studies of prehistory. The analysis necessary to derive all possible data from the sherds at this site, requires the services of a ceramics specialist, therefore, it is recommended that further studies of the ceramic artifacts present be conducted by such a specialist before a final determination of eligibility can be made.

Due to the presence of temporally diagnostic artifacts (ceramics) further data is necessary to determine if this site, as a stand-alone or individual resource, should be recommended as eligible or not eligible for the National Register and if it is or is not a historic property pursuant to the National Register or a historical resource per the California Register under the criteria for eligibility. In addition, results of additional data are necessary to determine if RAN-012 is considered a contributor to an existing and/or proposed archaeological district or landscape.

RAN-015

RAN-015 is an oblong-shaped historic site that covers a total surface area of 300 square meters. The site is located within the northwest portion of the 450 MW area of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of an intact desert pavement that is poorly to moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Moderate off highway vehicle use has disturbed the desert pavement within the site. Vegetation species on the site includes creosote and bunch grass.

This historic refuse scatter measures 37 meters east to west by 11 meters north to south and contains a total of 170 historic artifacts. It consists of two concentrations interpreted to be two historic refuse disposal loci. The site also includes additional refuse scattered throughout the site that lacked temporally diagnostic information. The prevailing cultural constituents within this site consist of historic artifacts. Artifact density at RAN-015 is low, with a calculated distribution of one artifact per 1.76 square meters. The overall condition of the site is fair due to off-road vehicle use.

The site contains two historic refuse scatters (loci) and a total of 170 historic artifacts (all associated with the loci), which include 101 glass shards (65 colorless, 25 brown, seven Purex/colorless, three aqua glass fragments, one milk jar fragment), seven brown bottle body shards (six Clorox bottle fragments and one amber bottle fragment), 10 flat colorless glass fragments, nine finish glass fragments (two jugs with small handles, one jar, four mason jars, two glass bottle fragments with threading), 26 metal cans (two spam, one tobacco, six condensed milk, 14 sanitary, two coffee, one paint thinner), four screw cap/lids, one rubber fragment, two plastic fragments, one shoe sole, three bottle bases (one colorless base with stippling, one green hexagonal base, one colorless circular base with stippling), one rectangular wire fragment, one bandage spool and four coat hanger wires. Six of the artifacts are temporally diagnostic artifacts consisting of cans and bottle fragments.

Locus 1 is located in the western portion of the site and measures four meters north to south by four meters east to west. Artifacts observed within Locus 1 consists of 10 shards of colorless window glass, 35 colorless bottle body shards, six brown bottle shards, one amber bottle shard, one mason jar rim, one colorless glass jug with small finger handle, one colorless bottle with continuous external thread, two spam cans, 12 sanitary cans, one matchstick filler can, one double hinged tobacco can and a metal clothes hanger.

Locus 2 is located 27 meters east of Locus 1 and measures eight meters north to south by six meters east to west. Artifacts observed within Locus 2 include approximately 30 unidentifiable shards of colorless glass, 25 shards of brown glass, seven shards of colorless Pyrex glass, three shards of aqua glass, one colorless milk jug shard, one colorless glass tumbler body fragment (drinking glass) , three colorless mason jar shards (with rim external continuous thread), one colorless jug with small finger handle, eight sanitary cans, two coffee cans, one bandage spool, four metal coat hangers, one complete paint thinner can labeled "RADIENT", three jar screw top lids, one small screw cap, one piece desiccated rubber, two pieces desiccated plastic, one shoe sole, one colorless bottle base with stippling, one green hexagonal bottle base and one colorless circular bottle base with stippling.

The further character of artifacts found within RAN-015 is unreported.

The more particular physical context for RAN-015, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Because the nature of the land surface and absence of evidence of any subsurface deposition, there is a very low likelihood that buried archaeological deposits will be present within this site or the fan piedmont.

Deposits of historic artifacts such as these typically represent episodes of refuse disposal after initial discard and/or loss of individual articles in situ. In the case of RAN-015, the large number of artifacts and the diversity of household products represented are consistent with what would be expected of a household refuse dumping episode or episodes. Though dates of manufacture can be determined for some of the artifacts present at RAN-015, the time between the initial use/consumption of the artifacts and their ultimate disposal cannot be known, so the specific date of their disposal cannot be reliably determined.

Artifacts present for which approximate dates of manufacture could be determined include: tobacco tin with hinge - 1910-1919; sanitary cans - 1922 to present; amber bottle fragment with maker's mark indicating it was manufactured by Maywood Glass Company between 1932-1942; one clear base with stippling and maker's mark "LM/Purex/Des. Pat. App. For" indicating that it was manufactured by Latchford-Marble Glass Company between 1939 to 1957; one Duraglas bottle base 1940-1963 with a maker's mark indicating that it was manufactured by the Hazel Atlas Glass Company between 1920 to 1964, mason jars dating back to post 1900, Clorox bottle neck with cork which would have been manufactured before 1920 (Goodman 2002). Also present was one amber bottle base, unstippled, with an Owens Illinois maker's mark that exhibits a sans serif "I" within an oval overlaid onto a diamond. Based on that maker's mark configuration, the date code "5" that appears to the right of the diamond would indicate a manufacturing date of 1935 (Lockhart 2004). This site also contains modern trash scattered throughout the site. Based on the dates listed above it can be determined that the episode of deposition occurred sometime after 1940.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. RAN-015 is situated atop a subordinate landform not conclusive for significant sub surface deposits within the fan piedmont geomorphic landform. And due to the absence of any surface evidence that would indicate buried historic refuse there appears to be a very low likelihood for subsurface archaeological deposits, therefore data potential is considered exhausted through recordation of RAN-0 15.

As a result, this site as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, RAN-015 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

RAN-018

RAN-018 is a circular-shaped historic aerial marker site that covers a total surface area of 342 square meters. The site is located within the eastern portion of the 450MW area of the Proposed IVS Project. The site is situated within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation (URS 2009). The surface area of the site consists of an open, elevated fan surface covered by intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. The site is bound by ephemeral gullies to the north, south, and west and there is evidence of occasional off highway vehicle use. Vegetation species on the site include creosote, cholla and bunch grass.

This historic aerial marker site measures six meters north to south by six meters east to west, and contains a total of one historic aerial marker feature and 13 historic (modern) artifacts. It consists of one concentration, interpreted to be a single feature. The cultural constituents within this site consist of a single historic feature and historic (modern) artifacts. The overall condition of the site is fair with alterations due to weathering and deterioration over time.

The artifact assemblage present includes five round nails, seven pieces of lathe, and fragments of white plastic.

Feature 1 is the remnants of a cross-shaped surface construction consisting of seven pieces of wood lathe and plastic lined with small rocks, apparently to hold the lathe and plastic in place. The assemblage of associated artifacts include five round nails (5.5 inches long, 0.25 inch diameter), seven pieces of lathe (1.375 inches by 0.375 inches) and fragments of white plastic material. No artifacts were observed within 30 meters or outside of the feature. The further character of artifacts found within RAN-018 is unreported.

The more particular physical context for RAN-01 8, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. The surface consists of finer grain material eroded from the fan piedmont that has formed a number of fan “aprons” which do not individually fully cover the entire area, and which interfinger and partially bury one another and piedmont remnants. The lack of soil development within the capped alluvial unit, and the similar degree of pavement development between the two units suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time; thus reducing the potential for extensive buried archaeology on that surface. Nonetheless, this area demonstrates the potential for (shallowly) buried preserved surfaces, but there is a high likelihood these deposits will represent the same constituents recorded on the surface. As a result, there is a very low to moderate likelihood for subsurface deposition. The desert pavement consists of small to large, sub-rounded to sub-angular metavolcanic, basalt, quartz, quartzite and granite gravels and cobbles overlaying coarse sands and fine gravels.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this feature as an aerial photography target. Such targets are used in order to parallax correct and geo-reference aerial photographs. No temporally diagnostic artifacts are present to determine if this particular target dates to the historic era. In addition, based on the presence of fragments of plastic it seems possible that this target is modern.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. RAN-018 is located within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. The lack of soil development within the capped alluvial unit suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time, thus reducing the potential for extensive buried archaeological deposits. As a result there is a very low to moderate likelihood for subsurface deposition. Nonetheless, though this area demonstrates some potential for (shallowly) buried preserved surfaces, there is a high likelihood these deposits will represent the same constituents recorded on the surface. Therefore, due to the low density of artifacts and low probability for significant subsurface artifacts, the data potential is considered exhausted through recordation of RAN-018.

As a result, RAN-018 as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, RAN-018 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

RAN-034

RAN-034 is a circular-shaped archaeological deposit that includes both prehistoric and historic components and covers a total surface area of 30,958 square meters. The site is located within the northwestern portion of the 450 MW of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface of the site consists of intact desert pavement that is poorly developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. The desert pavement in parts of the site has been disturbed. Soils contain alluvial sands made up of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote and smoketree.

This multicomponent historic refuse prehistoric scatter site measures 181 meters north to south by 171 meters east to west, and contains an estimated minimum of 400 historic and prehistoric artifacts. It consists of six concentrations interpreted to be five historic refuse scatters and one historic refuse and prehistoric lithic scatters. Within the loci there is a minimum of 350 artifacts and approximately 50 additional artifacts were observed outside the loci. The prevailing cultural constituents within this site consist of historic artifacts. Artifact density at RAN-034 is low, with a calculated distribution of one artifact per 77.4 square meters. The overall condition of the site is fair with some alterations caused by prospect mining, natural erosion and by off-highway vehicle activity as is evidenced by a single off highway vehicle track which runs through the site.

The site contains five historic refuse scatters and one multi-component locus (historic refuse and lithic scatter) with an estimated minimum of 400 artifacts (approximately 350 associated with loci), which include approximately 100 cans (church key-opened beverage, tobacco tins, hole-in-top, milk, coffee, kerosene, sanitary, fruit juice, paint, pepper, fish, meat, one spice tin). An estimated 25 ceramic fragments (plates, cups, one stoneware bowl, one tea pot), fragments from two "Clorox" bottles, one "Best Foods" bottle, one "Purex" bottle, one "Heinz" bottle, a minimum of 100 fragments from several liquor bottles, several soda bottles, around 25 fragments of "Vencill Dairy" milk bottles, a minimum of 100 fragments of thick pane glass, various other glass fragments from miscellaneous bottles and/or jars (colorless, brown, green, aqua, pink, manganese decolorized), one large rubber tire fragment, and tile fragments. Prehistoric artifacts include: one petrified wood secondary flake, one white cryptocrystalline silicate chalcedony secondary flake, and four nodules of fire affected sandstone. In addition seven marine shells (five Pismo clam shells, one abalone shell, and one conch shell) were observed within the historic refuse deposit. Based on the condition and variety, these shells are interpreted to be apart of the historical period refuse and are not prehistoric.

Locus 1 is located 198 feet southeast from the datum and measures 321 feet north to south by 27 feet east to west. Artifacts observed within Locus 1 include a glass scatter consisting of fragments from two "Clorox" bottles, one "Purex" bottle, four liquor bottles, one "Heinz" bottle, one "Best Foods" bottle, and various other fragments of green glass, colorless glass, pink glass and brown glass.

Locus 2 is located 46 feet south from Locus 1 and measures 37 feet north to south by 18 feet east to west. Artifacts observed within Locus 2 include: crushed and fragmentary metal cans (fish, meat, coffee, condensed milk, kerosene, pepper, and food), glass fragments (green glass, milk bottle, colorless glass, aqua glass, and manganese decolorized) and ceramic stoneware fragments.

Locus 3 is located 43 feet southeast from Locus 2 and measures 29 feet east to west by 20 feet north to south. Artifacts observed within Locus 3 include: crushed and fragmentary metal cans (milk, coffee, kerosene, tobacco, cocoa, beverages and food cans), fragments of ceramic dinnerware (cups, plates, bowls), one ceramic stoneware tea pot spout, one "Dixie Peach" pomade glass jar, and glass fragments (beverage glasses, dinnerware and window glass).

Locus 4 is located 141 feet southeast from Locus 3 and measures 37 feet north to south by 35 feet east to west. Artifacts observed within Locus 4 include whole and fragmentary metal cans (milk, fruit juice, meat, tobacco tin A14 and paint), 25 glass fragments of "Vencill Dairy" milk bottles, glass fragments (condiments, liquor bottles and beverage bottles) and ceramics (whiteware faux porcelain and a stoneware bowl).

Locus 5 is located 33 feet northwest from Locus 1 and measures 52 feet east to west by 10 feet north to south. Artifacts observed within Locus 5 include mostly thick pane glass fragments, crushed and fragmentary cans, and condiment bottle fragments, including one "Best Foods" bottle fragment.

Locus 6 is located 119 feet southwest from Locus 5 and measures 17 feet north to south by 13 feet east to west. Locus 6 is a multi-component locus with both historic and prehistoric artifacts which include a concentration of large shells (five pismo clams, one abalone shell and a small conch shell), four nodules of fire affected sandstone, one large rubber tire fragment, tile fragments, one white cryptocrystalline silicate chalcedony secondary flake, and one petrified wood secondary flake.

Those artifacts observed within 30 meters and outside the loci consist of approximately 50 can and glass fragments. The further character of artifacts found within RAN-034 is unreported.

The more particular physical context for RAN-034, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore, no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene is apparent. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret that deposits of historic artifacts such as the ones found at RAN-034 typically represent episodes of refuse dumping after initial discard and/or loss of individual articles in situ. In the case of RAN-034, the large number of artifacts and artifact types would more likely have resulted from dumping of the wide range of artifact types that would be expected in an assemblage of common household refuse. Though dates of manufacture can be determined for some of the artifacts present at RAN-034, the time between the initial use/consumption of the artifacts and their ultimate disposal cannot be known so the specific date of their disposal cannot be reliably determined.

Beginning circa 1880 manganese was added to glass to change its natural aqua color to clear. That addition had the unintended effect of turning the glass a particular amethyst color when exposed to ultraviolet light for extended periods of time. Such glass is termed "sun-colored-amethyst" glass (SCA) (Goodman 2002:1) and its manufacture predates 1920 when the practice of adding manganese ended. Hole-in-cap cans such as the lap-seam cans present at this site were initially introduced in the mid-19th century, were common in the late 19th to early 20th century, and fell out of favor in the 1920s when most manufacturers switched to sanitary cans (Goodman 2002). Also present is a colorless glass bottle base with a maker's mark that was used by the Knox Glass Company from 1932 to 1951 (Goodman 2002). Two other bottle bases bear the Owens Illinois maker's mark with a date code of "4", which indicates that it was manufactured in 1934 or 1944 (Owens Illinois did not switch to two-digit date codes until the 1950s). Yet another clear bottle had an Owens Illinois maker's mark and a date code of "0" dating its manufacture to 1930 or 1940 (Lockhart 2004). A tobacco tin present is of a style that was common beginning just after the turn of the 19th to 20th century and continued in production until R.J. Reynolds switched from cans to paper and plastic pouches in 1988 (Rock 1988). Based on this data, it would follow that the deposition of historic artifacts at RAN-034 would have taken place sometime after 1934.

The prehistoric component of RAN-034 consists of lithic flakes. Characteristics of this locus seem to support the interpretation that this is a modern dump of historic material collected from the area or historic refuse that has been deposited atop a prehistoric isolate. The most telling evidence is the vehicle tracks that enter the site from the south and stop at the locus. Additionally, the marine shells present seem far too well preserved to have remained on the surface since prehistoric times in this harsh environment. The shells show no patina and retain their original surfaces when the glossy surfaces of historic era glass artifacts found nearby have been sandblasted to a matte finish. Therefore, it would seem spurious to interpret the marine shells present at RAN-034 as prehistoric.

The lithic flakes present are of materials readily available in the surrounding area and display evidence of expedient methods of reduction, it might be possible to interpret the lithic component of the site as an expedient lithic reduction episode or locality (Jones and

Klar 2007). However, the fact that these two flakes appear in such an isolated and historic context, and their proximity to the likely modern marine shells described above supports the interpretation that the site does not represent a single reduction locality or episode, but rather a more recent deposition of residential trash that included these two lithic artifacts, or that these artifacts were present on the surface at the time of refuse disposal and are merely coincidental.

Although this site has artifacts with temporally diagnostic characteristics, the material remains cannot definitively be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. Therefore, data potential is considered exhausted through recordation of RAN-034.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, RAN-034 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

RAN-057

RAN-057 is an amorphous-shaped prehistoric lithic and ceramic scatter that covers a total surface of 222 square meters. The site is located within the eastern portion of the 450 MW area of the Proposed IVS Project. The site is situated within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation (URS 2009). The surface area of the site consists of a younger fan apron cut by ephemeral gullies and covered by intact desert pavement poorly developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Vegetation species on the site include creosote and ocotillo.

This lithic and ceramic scatter site measures 51 meters north to south by 20 meters east to west, and contains a total of 24 prehistoric artifacts. It consists of one concentration of lithic and ceramic artifacts, interpreted to be a ceramic scatter with a lithic component, with 15 artifacts. Nine additional artifacts were observed outside the locus. The prevailing cultural constituents within this site consist of prehistoric ceramic sherds. Artifact density at RAN-057 is low, with a calculated distribution of one artifact per 9.2 square meters. The overall condition of the site is fair, due to alterations caused by the presence of ephemeral gullies within the site location.

Locus 1 is a ceramic scatter with a lithic component measuring six meters northeast to southwest by four meters northwest to southeast. Locus 1 is located within the northernmost portion of the site boundary. Artifacts observed within Locus 1 include: 10 Tizon brownware sherds, one Tizon brownware rim sherd, one lower Colorado buffware sherd, one petrified wood multidirectional core and two petrified wood secondary flakes. Those artifacts observed within 30 meters and outside the locus consist of eight lower Colorado buffware sherds and one quartz tertiary flake. The further character of artifacts found within the site is unreported.

The more particular physical context for RAN-057, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. The surface consists of finer grain material eroded from the fan piedmont that has formed a number of fan “aprons” which do not individually fully cover the entire area, and which interfinger and partially bury one another and piedmont remnants (URS 2009). The lack of soil development within the capped alluvial unit, and the similar degree of pavement development between the two units suggest that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time; thus reducing the potential for extensive buried archaeology on that surface (URS 2009). Nonetheless, this area does demonstrate the potential for (shallowly) buried preserved surfaces, but there is a high likelihood these deposits will represent the same constituents recorded on the surface. As a result there is a very low to moderate likelihood for significant subsurface deposition.

Currently, the primary ethnic groups known to have occupied the region surrounding RAN-057 include the Diegueño and Kamia. Other groups known to have used/traveled/inhabited the area include the Tipai, Cocopa, Kumeyaay, Ipai, Quechan, Paipai and Cahuilla (Luomala 1978; Schaefer and Laylander 2007; URS 2009). In approximately AD 1200, the course of the Colorado River changed, refilling Lake Cahuilla and providing a stable water source that drew people from surrounding regions to repopulate the Colorado Desert. Ceramic wares which were introduced centuries before in other areas were brought into this region around this time (URS 2009). However, it has been argued that stable populations around the lake developed their own distinctive pottery formulas that became regional expressions of their families and locales (May ND). Although these groups each had specific approaches to the creation of ceramics, ceramic vessels were also traded along with subsistence resources and other items, infusing some uncertainty into the use of data from ceramics to associate one particular area with a particular tribal group or family (May ND). Therefore, it is unlikely that surface data could directly relate RAN-057 or the area surrounding it to a particular tribe/band.

Data gathered on ceramics in the area surrounding RAN-057 show evidence of a variety of ceramic types and techniques, but do frequently appear to be displaced and exhibit signs of water abrasion. Though paddle-and-anvil construction techniques were common among groups using this area, the tempers employed, vessel types manufactured, and decoration did vary between groups. The Diegueño used ground clay and did not add temper when manufacturing ceramics. They created a variety of vessels including ollas; bowls, cooking pots, and pipes (Rogers 1973:18; URS 2009). The Kamia sometimes added rose quartz as temper and produced the greatest variety of ceramics among the Yuman bands, including ollas, jars, canteens, bowls, rattles, plates, scoops, cups, and parchers. Kamia ceramics were painted after firing with red and/or black designs (Gifford 1931; Rogers 1973; URS 2009; Van Camp 1979:57). The Cocopah used ground and winnowed clay tempered with ground sherds to create a variety of vessels used for storage and cooking (Alvarez de Williams 1983:99). Quechan vessel types include bowls, parchers, cooking pots, small figurines, and large storage vessels that were used to float goods across rivers (Bee 1983:10; McGuire 1982; URS 2009).

The ceramics on this site appear to be heavily weathered (water abraded), displaced, and fragmentary making specific identification of paste and temper difficult without further analysis. These specimens appear to represent similar types of wares found in situ elsewhere within the project area. Further information regarding these ceramics was unreported.

The lithic component of this site is interpreted as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists primarily of secondary flakes and multidirectional cores. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone (petrified wood and quartz) materials that is a constituent of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent two single reduction localities or episodes, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret sites such as RAN-057 with richer assemblages containing ceramics in association with lithic debitage to most likely represent subsistence procurement and processing activities.

This site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. Because this site contains ceramics which is temporally diagnostic, analysis of these artifacts can provide additional information regarding the temper and source of clay, as well as, the method of construction and type of vessel. Analysis of these types of artifacts requires a controlled environment and comparative sample in order to identify unique morphological characteristics and regional ware type. Because RAN-057 is located within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation, there is a very low to moderate likelihood for subsurface deposition.

As a result, because of the presence of temporally diagnostic ceramics, additional data is needed to determine if this site, as a stand-alone or individual resource, should be recommended eligible for the National Register as a historic property pursuant to the National Register or as a historical resource per the California Register for eligibility. In addition, results of additional data are necessary to determine if RAN-057 is considered a contributor to an existing and/or proposed archaeological district or landscape.

RAN-061

RAN-061 is an amorphous-shaped lithic scatter that covers a total surface of 840 square meters. The site is located within the central portion of the 450 MW area of the Proposed IVS Project. The site is situated within the fan piedmont remnant geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of an open and elevated, very old, fan surface covered by intact desert pavement that is well developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site includes creosote and ocotillo.

This lithic scatter site measures 180 meters northeast to southwest by 25 meters northwest to southeast, and contains a total of 335 prehistoric artifacts. It consists of 12 concentrations interpreted to be 12 single reduction loci, with 334 artifacts, and one additional artifact was observed outside the loci. The prevailing cultural constituents within this site consist of prehistoric artifacts. Artifact density at RAN-061 is low, with a calculated distribution of one artifact per 2.5 square meters. The overall condition of the site is good, though there have been alterations caused by off-highway vehicle activity.

The site contains 12 lithic reduction loci and a total of 335 artifacts which include: 257 metavolcanic flakes (61 primary, 113 secondary and 83 tertiary), 12 cryptocrystalline silicate chert flakes (four primary, five secondary and three tertiary), 44 quartz flakes (nine primary, 13 secondary and 22 tertiary), one basalt secondary flake, nine metavolcanic cores (six uni-directional, two bi-directional and one multi-directional), three cryptocrystalline silicate chert cores (one uni-directional and two bi-directional), two uni-directional quartz cores, one uni-directional basalt core, three quartz hammerstones, two metavolcanic hammerstones, and one granite anvil.

Locus 1 is located at the north end of the site and measures six meters northeast to southwest by three meters northwest to southeast. Artifacts observed within Locus 1 include 35 black porphyritic metavolcanic flakes (21 primary, 13 secondary and one tertiary) and one point provenienced quartz hammerstone.

Locus 2 is located 17 meters south of Locus 1 and measures four meters northeast to southwest by two meters northwest to southeast. Artifacts observed within Locus 2 include 15 gray-black porphyritic metavolcanic flakes (seven primary and eight secondary), one basalt secondary flake, and one point provenienced uni-directional gray-green porphyritic core.

Locus 3 is located 18 meters southwest of Locus 2 and measures two meters north to south by one meters east to west. Artifacts observed within Locus 3 include: 11 green porphyritic metavolcanic flakes (two primary, seven secondary and two tertiary), one point provenienced uni-directional green metavolcanic core, and one point provenienced black metavolcanic hammerstone.

Locus 4 is located 5 meters west of Locus 3 and measures 10 meters north to south by four meters east to west. Artifacts observed within Locus 4 include: 175 gray-green porphyritic metavolcanic flakes (20 primary, 75 secondary and 80 tertiary), two point provenienced green porphyritic metavolcanic cores (one uni-directional and one bi-directional), one point provenienced uni-directional black porphyritic metavolcanic core, and one point provenienced gray-black porphyritic metavolcanic hammerstone.

Locus 5 is located 19 meters west of Locus 4 and measures one meter north to south by one meter east to west. Artifacts observed within Locus 5 include: eight gray-green metavolcanic flakes (three primary and five secondary), one point provenienced uni-directional gray-black metavolcanic core, and one point provenienced multi-directional gray-green metavolcanic core.

Locus 6 is located 27 meters southwest of Locus 5 and measures three meters north northeast to south southwest by two meters west northwest to east southeast. Artifacts observed within Locus 6 include: 33 translucent white quartz flakes (five primary, eight secondary and 20 tertiary), one point provenienced uni-directional rose quartz core, and one point provenienced quartz hammerstone.

Locus 7 is located 88 meters northeast of Locus 6 and measures one meter north to south by one meter east to west. Artifacts observed within Locus 7 include: three green porphyritic metavolcanic flakes (two primary and one secondary) and one point provenienced bi-directional green porphyritic metavolcanic core.

Locus 8 is located 10 meters southwest of Locus 7 and measures eight meters northeast to southwest by one meter northwest to southeast. Artifacts observed within Locus 8 include five clear quartz flakes (one primary and four secondary).

Locus 9 is located 37 meters southwest of Locus 8 and measures two meters northeast to southwest by one meter northwest to southeast. Artifacts observed within Locus 9 include five gray porphyritic metavolcanic flakes (two primary and three secondary), and one point provenienced granite anvil.

Locus 10 is located 52 meters northeast of Locus 9 and measures one meters east to west by one meter north to south. Artifacts observed within Locus 10 include: five green porphyritic metavolcanic flakes (four primary and one secondary), one point provenienced uni-directional black porphyritic metavolcanic core, and one point provenienced uni-directional basalt core.

Locus 11 is located 24 meters southwest of Locus 10 and measures two meters north to south by one meter east to west. Artifacts observed within Locus 11 include: six quartz flakes (three primary, one secondary and two tertiary), one point provenienced uni-directional smoky quartz core, and one point provenienced quartz hammerstone.

Locus 12 is located 17 meters west of Locus 11 and measures six meters north to south by one meters east to west. Artifacts observed within Locus 12 include 12 orange-brown cryptocrystalline silicate chert flakes (four primary, five secondary and three tertiary), and two point provenienced bi-directional orange-brown cryptocrystalline silicate chert cores.

Those artifacts observed within 30 meters and outside of the loci consist of one point provenienced uni-directional red cryptocrystalline silicate chert core. The further character of artifacts associated with the site is unreported.

The more particular physical context for RAN-061, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be a very old fan surface within the fan piedmont remnant landform. The fan piedmont remnant landform is an isolated exposure surrounded by the fan apron land form that has been determined to have the same geomorphological characteristics as the fan piedmont (URS 2009:CUL-6). The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists primarily of secondary and tertiary flakes and unidirectional cores, with hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone (metavolcanic) material, that is a constituent of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent 12 single reduction localities or episodes. It should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. RAN-061 is situated atop a subordinate landform characterized as a very old fan surface within the fan piedmont remnant landform. The fan piedmont remnant landform is an isolated exposure surrounded by the fan apron land form that has been determined to have the same geomorphological characteristics as the fan piedmont (URS 2009: CUL-6). This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits, therefore data potential is considered exhausted through recordation of RAN-061.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, RAN-061 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

RAN-081

RAN-081 is an amorphous-shaped lithic scatter that covers a total surface area of 12,045 square meters. The site is located within the eastern portion of the 450 MW area of the Proposed IVS Project and is situated atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of gently undulating surface covered by intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation species on the site include creosote, desert sunflower, burroweed and bunchgrass.

This site measures 220 meters north to south by 125 meters east to west, and contains a total of 648 prehistoric artifacts. It consists of 38 concentrations interpreted to be 32 lithic reduction and six lithic scatter loci, with a total of 600 artifacts plus 48 additional artifacts observed outside the loci. The prevailing cultural constituents within this site consist of prehistoric lithic artifacts. Artifact density at RAN-081 is medium, with a calculated distribution of one artifact per 18.59 square meters. The overall condition of the site is fair with some alterations due to off-highway vehicle use.

The artifact types and materials present at RAN-081 include 345 metavolcanic flakes (183 primary, 130 secondary and 32 tertiary), 17 metavolcanic cores, 10 metavolcanic tested cobbles, one metavolcanic hammerstone, 98 quartz flakes (46 primary, 38 secondary and 14 tertiary), three quartz cores (two uni-directional and one multi-directional), 61 quartzite flakes (19 primary, 19 secondary, nine tertiary and 14 shatter), one quartzite multi-directional core, one quartzite tested cobble, one quartzite hammerstone, 40 rhyolite flakes (21 primary, 15 secondary and four tertiary), one rhyolite multi-directional core, 47 cryptocrystalline silicate flakes (26 primary, 15 secondary and six tertiary), six cryptocrystalline silicate cores (including two unidirectional and three multi-directional), 14 basalt flakes (10 primary and four secondary) one basalt uni-directional core and one basalt hammerstone.

Locus 1 is located in the southwestern portion of the site and measures 3 meters northeast to southwest by 2 meters northwest to southeast. Artifacts observed within Locus 1 include nine green metavolcanic flakes (two primary, six secondary and one tertiary).

Locus 2 is located 11 meters northeast of Locus 1 and measures 2 meters northeast to southwest by 2 meters northwest by southeast. Artifacts observed within Locus 2 include 13 rhyolite flakes (five primary, five secondary and three tertiary) and one multi-directional core.

Locus 3 is located 12 meters southeast of Locus 2 and measures 2 meters north to south by one meter east to west. Artifacts observed within Locus 3 include eight green metavolcanic flakes (five primary, one secondary and two tertiary) and one uni-directional core.

Locus 4 is located 6 meters northeast of Locus 3 and measures 2 meters north to south by 4 meters east to west. Artifacts observed within Locus 4 include 25 green metavolcanic flakes (12 primary, 11 secondary and two tertiary) and one uni-directional core.

Locus 5 is located 5 meters northeast of Locus 4 and measures 1 meter north to south by 2 meters east to west. Artifacts observed within Locus 5 include six green metavolcanic flakes (five primary and one secondary).

Locus 6 is located 11 meters northeast of Locus 5 and measures 4 meters north to south by 2 meters east to west. Artifacts observed within Locus 6 include six green metavolcanic primary flakes and one bi-directional core.

Locus 7 is located 17 meters to the northeast of Locus 6 and measures 2 meters north to south by 1 meter east to west. Artifacts observed within Locus 7 include three green metavolcanic primary flakes, one uni-directional core and one bi-directional core.

Locus 8 is located 21 meters southeast of Locus 7 and measures 3 meters north to south by 4 meters east to west. Artifacts observed within Locus 8 include 13 green metavolcanic flakes (nine primary and four secondary), two fine grained green metavolcanic secondary flakes, six quartz flakes (four primary, one secondary and one tertiary), one quartz uni-directional core, three metavolcanic bi-directional cores and one hammerstone.

Locus 9 is located 18 meters southeast of Locus 8 and measures 3 meters northwest to southeast by 2 meters northeast to southwest. Artifacts observed within Locus 9 include 18 green metavolcanic flakes (nine primary and nine secondary) and one uni-directional core.

Locus 10 is located 56 meters northeast of Locus 9 and measures 2 meters north to south by 3 meters east to west. Artifacts found in Locus 10 include 10 cryptocrystalline silicate flakes (two primary, seven secondary and one tertiary) and four quartz flakes (three primary and one secondary).

Locus 11 is located 19 meters northeast of Locus 10 and measures 2 meters northeast to southwest by 1 northwest to southeast. Artifacts observed in Locus 11 include seven basalt flakes (five primary and two secondary) and one hammerstone.

Locus 12 is located 12 meters northeast of Locus 11 and measures 2 meters north to south by 1 meter east to west. Artifacts observed within Locus 12 include six green metavolcanic flakes (five primary and one tertiary).

Locus 13 is located 17 meters southeast of Locus 12 and measures 5 meters north to south by 7 meters east to west. Artifacts observed within Locus 13 include 25 green metavolcanic flakes (19 primary and six secondary) and three fine grained metavolcanic primary flakes.

Locus 14 is located 31 meters southeast of Locus 13 and measures 1 meter north to south by 0.4 meters east to west. The artifacts found within Locus 14 include three white cryptocrystalline silicate flakes (two primary and one secondary) and one multi-directional core.

Locus 15 is located 5 meters southeast of Locus 14 and measures 1 meter north to south by 2 meters east to west. Artifacts observed within Locus 15 consist of 14 pieces of quartzite shatter.

Locus 16 is located 14 meters northeast of Locus 15 and measures 2 meters northwest to southeast by 0.3 meters northeast to southwest. Artifacts observed within Locus 16 include four brown cryptocrystalline silicate primary flakes and one uni-directional core.

Locus 17 is located 22 meters northeast of Locus 16 and measures 3 meters northeast to southwest by 2 meters northwest to southeast. Artifacts observed within Locus 17 include 25 quartz flakes (10 primary, 11 secondary and four tertiary) and one uni-directional core.

Locus 18 is located 5 meters south of Locus 17 and measures 3 meters northeast to southwest by 2 meters northwest to southeast. Artifacts found within Locus 18 include 36 quartz flakes (19 primary, 13 secondary and four tertiary) and one multi-directional core.

Locus 19 is located 6 meters northwest of Locus 18 and measures 4 meters north to south by 2 meters east to west. Artifacts observed within Locus 19 include 44 green metavolcanic flakes (15 primary, 27 secondary and two tertiary).

Locus 20 is located 84 meters northwest of Locus 19 and measures 1 meters north to south by 3 meters east to west. Artifacts observed within Locus 20 include 15 green metavolcanic flakes (six primary, seven secondary and two tertiary).

Locus 21 is located 8 meters north of Locus 20 and measures 4 meters northeast to southwest by 3 meters northeast to southeast. Artifacts observed within Locus 21 include 26 green metavolcanic flakes (16 primary, nine secondary and one tertiary) and one multidirectional core.

Locus 22 is located 38 meters north of Locus 21 and measures 3 meters northeast to southwest by 2 meters northwest by southeast. Artifacts observed within Locus 22 include 27 rhyolite flakes (16 primary, 10 secondary and one tertiary).

Locus 23 is located 19 meters northeast of Locus 22 and measures 5 meters northwest to southeast by 3 meters northeast to southwest. Artifacts observed within Locus 23 include 27 quartz flakes (10 primary, 12 secondary and five tertiary), and four black metavolcanic primary flakes.

Locus 24 is located 9 meters north of Locus 23 and measures 5 meters north to south by 2 meters east to west. Artifacts observed within Locus 24 include 34 black metavolcanic flakes (17 primary, 11 secondary and six tertiary).

Locus 25 is located 7 meters southeast of Locus 24 and measures 1 meters north to south by one meter east to west. Artifacts observed within Locus 25 include seven green metavolcanic flakes (three primary, three secondary and one tertiary).

Locus 26 is located 60 meters southeast of Locus 25 and measures 2 meters northwest to southeast by one meter northeast to southwest. Artifacts observed within Locus 26 include seven green metavolcanic flakes (four primary and three secondary)

Locus 27 is located 7 meters south of Locus 26 and measures 3 meters northwest to southeast by 2 meters northeast to southwest. Artifacts observed within Locus 27 include eight green metavolcanic flakes (three primary, three secondary and two tertiary) and one uni-directional core.

Locus 28 is located 38 meters northeast of Locus 27 and measures 1 meter north to south by 1 meter east to west. Artifacts observed within Locus 28 include six white cryptocrystalline silicate flakes (three primary, two secondary and one tertiary) and one multi-directional core.

Locus 29 is located 26 meters east of Locus 28 and measures 6 meters northwest to southeast by three meters northeast to southwest. Artifacts observed within Locus 29 include 14 green metavolcanic flakes (five primary, three secondary and six tertiary), two cryptocrystalline silicate primary flakes, one primary basalt flake and one metavolcanic tested cobble.

Locus 30 is located 31 meters south of Locus 29 and measures 1 meter north to south by 5 meters east to west. Artifacts observed within Locus 30 include six basalt flakes (four primary and two secondary), four green metavolcanic primary flakes and one basalt uni-directional core.

Locus 31 is located 13 meters southwest of Locus 30 and measures 6 meters northwest to southeast by 7 meters northeast to southwest. Artifacts observed within Locus 31 include 32 green metavolcanic flakes (12 primary, 17 secondary and three tertiary) and eight quartzite flakes (three primary, two secondary and three tertiary).

Locus 32 is located 21 meters southwest of Locus 31 and measures 2 meters northeast to southwest by 2 meters northwest to southeast. Artifacts observed within Locus 32 include 13 quartzite flakes (four primary, four secondary and five tertiary).

Locus 33 is located 19 meters south of Locus 32 and measures 5 meters north to south by one meter east to west. Artifacts observed within Locus 33 include six quartzite flakes (four primary and two secondary) and one multi-directional core.

Locus 34 is located 4 meters northwest of Locus 33 and measures 1 meter north to south by1 meter east to west. Artifacts observed within Locus 34 include seven green metavolcanic flakes (four primary and three secondary).

Locus 35 is located 9 meters southeast of Locus 34 and measures 1 meter northwest to southeast by 1 meter northeast to southwest. Artifacts observed within Locus 35 include seven green metavolcanic flakes (two primary, two secondary, and three tertiary) and one multi-directional core.

Locus 36 is located 2 meters southeast of Locus 35 and measures 1 meter north to south by two meters east to west. Artifacts observed within Locus 36 consist of six quartzite flakes (two primary, three secondary and one tertiary).

Locus 37 is located 12 meters southwest of Locus 36 and measures 2 meters north to south by 2 meters east to west. Artifacts observed within Locus 37 include 11 white cryptocrystalline silicate flakes (five primary, three secondary and three tertiary) and one multi-directional core.

Locus 38 is located 15 meters south of Locus 37 and measures 1 meter northeast to southwest by 1 meter northwest to southeast. Artifacts observed within Locus 38 include six gray-white cryptocrystalline silicate flakes (three primary, two secondary and one tertiary) and one uni-directional core.

Those artifacts observed within 30 meters and outside of the 38 loci consist of 12 green metavolcanic flakes (ten primary and two secondary), four green metavolcanic cores (including one uni-directional and one bi-directional), one black metavolcanic core, nine metavolcanic tested cobbles, 14 quartzite flakes (six primary, and eight secondary), one quartzite tested cobble, one quartzite hammerstone, five cryptocrystalline silicate primary flakes (three brown and two gray), and one white cryptocrystalline silicate core. The further character of artifacts associated with RAN-081 is unreported.

The more particular physical context for RAN-081, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, with debitage consisting of primary, secondary, and tertiary flakes, cores, angular waste/shatter, and hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary materials (green metavolcanic, cryptocrystalline silicate, quartz, basalt, and quartzite) that are constituents of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least 38 reduction episodes/localities, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. RAN-081 is situated atop a subordinate landform characterized as an older fan surface with alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area there is very low likelihood for subsurface archaeological deposits, therefore data potential is considered exhausted through recordation of RAN-081.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, RAN-081 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

T-03

T-03 is a linear prehistoric/historic trail that covers a total length of 438 meters. The site is located within the central northern portion of the 450 MW area of the Proposed IVS Project. The site is situated within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation (URS 2009). The surface area of the site consists of a fan apron with intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Vegetation species on the site include creosote, saltbush and ocotillo. The slope throughout the course of the trail is less than one degree with an aspect that ranges from north to northeast. The overall condition of the site is poor due to observable evidence of recent off-highway vehicle (OHV) disturbance.

T-03 is recorded in three separate segments, trending in an east to west direction. The trail has been cut into three segments by ephemeral gullies. All three segments are 40 centimeters wide and the total length of the segments combined is 438 meters. Segment A is approximately 232 meters in length, Segment B is approximately 64 meters in length, and Segment C is approximately 142 meters in length.

There are no artifacts directly associated with the trail. However, the trail does run through a group of three isolates and three sites that appear to be aligned with the east to west direction of this trail (EBR-095, EBR-097, EBR-102, EKJ-S2-014, EJK-ISO-013 and EJK-ISO-012).

Trails such as T-03 are likely surviving segments of a larger network of trails that once existed in the region. Trails were important to prehistoric people in that they appear to have helped fulfill an inherent human need for physical and spiritual security by providing safer and more reliable connections between territories and resource patches, and served the "socio-economic needs of settlement and exploitation patterns, migration, visitation, trade, war, quarrying, and making possible the location of central ceremonial areas" (von Werlhof 1988:52).

Trail T-03 and the immediate area around it have characteristics that may speak to the importance of trails to prehistoric people. The trail is evidenced as a narrow (approximately 40 centimeters) strip of land where larger stones are conspicuously absent from the desert pavement. Along the two sides of the trail are relatively higher concentrations of larger stones, supporting the interpretation that travelers would clear larger stones from the path, tossing them to the side. Not only would that practice have made foot travel easier by removing obstructions, but the resulting surface of the trail has a higher proportion of siliceous desert surface, which would reflect more moonlight, making night travel safer (von Werlhof 1988). Additionally, three sites and three isolated artifacts lie in close proximity to the trail and are in apparent alignment with the trail's direction, giving evidence to the possible use of the trail to facilitate resource procurement.

Trails can be important and relatively rare resources which can help facilitate interpretations of prehistory and prehistoric lifeways. Trails such as T-03 are rare because the evidence of them is often so faint and ephemeral that it is most often erased by natural erosion, soil development, mechanical disturbance, and bioturbation. Additionally, trails often follow the most efficient travel route through an area. Over time, subsequent travel routes such as horse trails, ox cart roads, and eventually modern roads and highways are designed to follow the same route and are overlaid on the trail such that its existence is only known through oral history. It is in arid, relatively unpopulated places such as the project area that trails can still be recognized as remnants of ancient pathways (Davis 1974). Because trails were used to connect resource areas, territories, habitations, and ceremonial sites, they can be important sources of information to recover the locations of unknown resources. Overall site integrity of trail T-03 is extremely poor, primarily due to heavy OHV use and gravel mining within the area, activities from the adjacent Plaster City, dirt roads, as well as erosional processes. The full extent of this trail has been mapped and portions have been destroyed by these intrusive elements, therefore data potential of T-03 is considered exhausted through recordation.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is a historic property pursuant to the National Register and a historical resource per the California Register under any of the criteria for eligibility. In addition, T-03 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

T-52

Site T-52 is a linear alignment of ground that appears to have been cleared of larger stones and cobbles, which is interpreted to be a surviving segment of a prehistoric trail. The site is 660 meters long. At its western terminus it lies approximately 15 meters north of and is parallel to a road (approximately east to west) for a distance of approximately 400 meters At that point it curves and extends in a north to south direction to a point approximately 290 meters north of another road. Site T-52 is located within the southeastern portion of the 450 MW area of the Proposed IVS Project. The site is situated within the fan apron/skirt geomorphic landform, which indicates a

Late Pleistocene/Early Holocene period of formation (URS 2009). The surface area of the site consists of an alluvial fan with intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Vegetation species on the site include smoketree, mesquite and bunch grass.

T-52 is recorded in one segment that trends east to west in its western portion and north to south in its eastern portion. The segment is approximately 660 meters long, 40 centimeters to one meter wide, and less than five centimeters deep. The western portion of the trail segment runs adjacent to a large ephemeral gully and is parallel to a road. The surface of the trail segment shows evidence indicating that its surface has been cleared by casting-off larger cobbles to either side of the trail. Overall condition of the trail is poor, with evidence of an expansion of the trail width caused by off-highway vehicle (OHV) motorcycle activity in the area. Two cultural resources are within close proximity: JM-041 and JM-042.

Trails such as T-52 may be surviving segments of a larger network of trails that once existed in the region. Trails were important to prehistoric people in that they helped fulfill an inherited human need for physical and spiritual security by providing safer and more reliable connections between territories and resource patches, and served the "socioeconomic needs of settlement and exploitation patterns, migration, visitation, trade, war, quarrying, and making possible the location of central ceremonial areas" (von Werlhof 1988:52).

Trail T-52 does possess some characteristics that would support the interpretation of it as a prehistoric trail. The trail is evidenced as a narrow (approximately 40 to 100 centimeters wide) strip of land where larger stones are conspicuously absent from the desert pavement. Along the two sides of the trail are relatively higher concentrations of larger stones, supporting the interpretation that travelers would clear larger stones from the path, tossing them to the side. That practice of clearing stones would have made foot travel easier by removing obstructions. Additionally, the resulting trail would have a higher proportion of siliceous desert surface, which would reflect more moonlight, making night travel safer (von Werlhof 1988). Furthermore, T-52 crosses through two prehistoric archaeological sites; JM-041, which is a small lithic scatter, and JM-42, which is a dense lithic scatter and therefore may be associated with both those resources. If that is the case, trail T-52 may have been used for travel to or through resource procurement areas.

Trails can be important and relatively rare resources that can help facilitate interpretation of prehistory and prehistoric lifeways. Trails such as T-52 are rare because the evidence of them is so faint and ephemeral that it is most often erased by natural erosion, soils development, mechanical disturbance and bioturbation. Additionally, trails often follow the most efficient travel route through an area. Over time, subsequent travel routes such as horse trails, ox cart roads, and eventually modern roads and highways are constructed to follow the same route and thereby overlay the prehistoric trail such that its existence is only known through oral history. It is in arid, relatively unpopulated places such as the Project area that can still be recognized as remnants of ancient pathways

(Davis 1974). Because trails were used to connect resource areas, territories, habitations and ceremonial sites, they can be important sources of information to recover the locations of unknown archaeological resources and possibly traditional cultural properties.

However, the overall condition of this particular trail segment is poor, with OHV tracks running both parallel and perpendicular to the trail segment. OHV activity also appears to have expanded the width of the trail, making it difficult to determine the original dimensions of the trail, therefore, degrading its integrity. Though this trail is interpreted by the archaeologists for the applicant to be prehistoric, deterioration caused by overlaid OHV trails make it difficult to discern and interpret. Therefore, it is possible that trail may actually be a result of modern OHV activity in the area rather than prehistoric use.

Therefore, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, T-52 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

ACCESS ROAD

T-05

T-05 is a linear trail that covers a total length of 380 meters. The site is located within the 100 foot-wide proposed access road corridor east of the 450 MW area of the Proposed IVS Project. The trail is situated atop ancient Lake Cahuilla Playa within the lower lake basin which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating a Late Pleistocene/Early Holocene period of formation (URS 2009). Observed profiles in this area indicate that the soils are made up of thick deposits of gray fine sand and silt that may be a combination of Colorado River supplied lake sediments and fines flushed into the lake by streams and washes that once terminated nearby at the shoreline. The trail appears to have been cleared through use and possible cast-off of cobbles to either side, leaving only small gravels and sand within the trail. Vegetation species on the site include creosote. Adjacent to the trail there are well developed creosote bushes growing which might indicate that the path has not been used recently. The trail is dissected by ephemeral drainages. Sediments in the drainages consist of silt sand alluvium loam.

T-05 is recorded in three separate segments, trending in an east to west direction. Other segments are present that are discontinuous and erased from the surface by ephemeral gullies, which were not mapped but most likely connect with the mapped portions of this trail. All three mapped segments are 40 centimeters wide. The total length of the segments combined is 380 meters. Segment A is approximately 80 meters in length, Segment B is approximately 77 meters in length and Segment C is approximately 223 meters in length. It appears that the surface of the trail has been cleared through the use and possible maintenance of moving larger cobbles to either side. The overall condition of the site is poor due to observable evidence of recent off-road vehicle disturbance and erosion.

Trail segments are located within a highly disturbed context with both historic and OHV activity present in the area. Historic and/or OHV users may have generated these segments, making it difficult to differentiate prehistoric from historic due to the high level of surrounding background noise. The trail is conspicuously straight and aligned exactly east to west, making it seem unlikely that this is a prehistoric trail. It runs parallel and close to the southern boundary of site EBR-207, which is a historic refuse dump. The trail also appears to have been naturally eroded and therefore, has reduced integrity.

Because this site lacks unique or temporally diagnostic characteristics, it cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of the spatial configuration of the resource has been accounted for during the recordation process.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National

Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, T-05 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

LAYDOWN AREA

DRK-139

DRK-139 is an amorphous shaped prehistoric lithic scatter that is situated directly east of two roads. The site covers a total surface area of 9,845 square meters. The site is located in the eastern portion of the laydown area of the Proposed IVS Project within the lower lake basin geomorphic landform (URS 2009). Sediments observed within this site consist of silts, eolian and course sands with sandstone exposures occurring in graded/disturbed areas at the south end of the site. Vegetation species on the site include creosote scrub.

This lithic scatter site measures 149 meters north to south by 104 meters east to west, and contains a total of 126 prehistoric artifacts. It consists of five concentrations of lithic artifacts, interpreted to be five single reduction loci, with 65 artifacts plus 61 additional artifacts observed outside the loci. The prevailing cultural constituents within this site consist of prehistoric lithic reduction debitage artifacts. Artifact density is low with a calculated distribution of one artifact per 78.1 square meters. The overall condition of the site ranges from fair to poor. Primary disturbances are attributed to mechanical grading (i.e. appears to be a seven meter wide graded road alignment that bisects the southernmost portion of the site); off-highway vehicle (OHV) tracks (i.e. four narrow two-tracks observed running roughly parallel to each other and trending north-south); modern refuse associated with commuter traffic and unpermitted dumping of residential repair/remodeling and/or landscape clipping refuse.

The site consists of five single reduction loci and a total of 126 artifacts, which include: eight angular metavolcanic hammerstones, 13 metavolcanic cores (three multi-directional, three bi-directional, six uni-directional and one cryptocrystalline silicate jasper uni-directional core fragment), 74 metavolcanic flakes (16 primary, 36 secondary, 22 tertiary and one shatter), 17 basalt flakes (two primary, eight secondary and seven tertiary), one cryptocrystalline silicate chalcedony secondary flake and 13 tested cobbles (eight metavolcanic and five basalt).

Locus 1 is located in the northwest portion of the site and measures one meter north to south by one meter east to west. Artifacts observed within locus 1 include: 17 metavolcanic flakes (three primary, eight secondary and six tertiary).

Locus 2 is located seven meters north of Locus 1 and measures one meter north to south by 1.5 meters east to west. Artifacts observed within Locus 2 include: 11 metavolcanic flakes (four primary, six secondary and one tertiary) and one metavolcanic multidirectional core.

Locus 3 is located 34 meters east of Locus 2 and measures 32 centimeters north to south by one meter east to west. Artifacts observed within Locus 3 include: four metavolcanic flakes (one primary, one secondary and two tertiary) and one metavolcanic unidirectional core.

Locus 4 is located 16 meters east of Locus 3 and measures one meter north to south by 1.5 meters east to west. Artifacts observed within Locus 4 include: 14 metavolcanic flakes (one primary, five secondary and eight tertiary) and one metavolcanic bidirectional core.

Locus 5 is located 50 meters southwest of Locus 4 and measures one meter north to south by one meter east to west. Artifacts observed within Locus 5 include: 15 basalt flakes (two primary, six secondary and seven tertiary) and one uni-directional basalt core.

Artifacts observed outside the identified loci and within thirty meters include: 30 flakes (seven primary, 18 secondary, and five tertiary), one piece of angular waste/shatter, nine cores, eight hammerstones, and 13 tested cobbles. The further character of artifacts associated with DRK-139 is unreported.

The more particular physical context for DRK-139, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be within the lower lake basin which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating a Late Pleistocene/Early Holocene period of formation. The lake basin geomorphic landform consists of two distinct components; the lower lake basin and the beach zone or interface between the lake basin and the fan apron. The surface of the lower lake basin is generally very flat to very gently sloping, with a thin mantle of latest Holocene alluvium and eolian silts overlaying silts and clays. Because older surfaces have been overlain with a thin layer of more recent materials that were deposited after human occupation began in the area, there is a moderate to high likelihood for subsurface deposition within the lower-lying lake basin portion. Because episodes of filling and emptying of Lake Cahuilla that have occurred at various times in prehistory would have moved and disturbed soils at or near the surface of the lake basin landform, archaeological features preserved there will likely be disturbed or fragmentary. Soils within the lower lake basin are made up of thick deposits of gray fine sand and silt that may be a combination of Colorado River supplied lake sediments and fines flushed into the lake by streams and wash that once terminated nearby at the shoreline. Specifically, the subordinate landform characteristics observed within this site appear to be an older fan surface with well developed desert pavement covered surface which appears to be exposed within the lake basin deposits as a result of deflation and erosional processes.

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, with debitage consisting primarily of primary, secondary, and tertiary flakes, cores, angular waste/shatter and hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone material (metavolcanic) that is a constituent of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least five single reduction localities or episodes; but it should not be discounted that artifacts within this site may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. DRK-139 is situated in primarily deflationary and minimally, in an erosional environment, primarily characterized by a desert pavement covered older fan surface interfacing with the lake basin. Because this lithic scatter site occurs atop an older fan surface that interfaces with the lake basin, there appears to be little to no potential for buried archaeological deposits beyond near surficial contexts where low to moderate energy sheet wash action and eolian sands have shallowly buried cultural deposits. This site does not appear to have the potential to yield important additional information about the past. Due to the low density of artifacts and the low probability for subsurface deposits, the data potential for this site is considered exhausted.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, DRK-132 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

DRK-140

DRK-140 is an amorphous/oval-shaped prehistoric site that covers a total surface area of 3,038 square meters. The site is located in the eastern portion of the laydown area of the Proposed IVS Project. The site is situated within the lower lake basin which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating a Late Pleistocene/Early Holocene period of formation (URS 2009). Sediments consist of silts and fines through very course, poorly sorted, sub-rounded sands, with small hummocks of accumulated eolian sands surrounding individual bushes. Poorly sorted gravels (range from 0.5 centimeters to 5 centimeters in maximum dimension) of sub-rounded metavolcanic, quartz, quartzite, and chert materials occur over the entire site area. Vegetation appears to be healthy; species observed include creosote, bunchgrass and burrow weed.

This lithic scatter measures 118 meters northeast to southwest by 44 meters northwest to southeast, and contains a total of 21 prehistoric artifacts. The prevailing cultural constituents within this site consist of lithic reduction debitage. Artifact density at DRK--140 is low, with a calculated distribution of one artifact per 144.6 square meters. The overall condition of the site is good to fair. Secondary disturbances are attributed to bioturbation, especially into hummocks surrounding vegetation.

This site contains a total of 21 artifacts that include: one weathered black metavolcanic edge modified flake, one globular green metavolcanic multidirectional core/hammerstone, and 19 metavolcanic flakes (one primary, eight secondary, 10 tertiary). The further character of artifacts within DRK-140 is unreported.

The more particular physical context for DRK-140, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be within the lower lake basin which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating a Late Pleistocene/Early Holocene period of formation. The surface of the lower lake basin is generally very flat to very gently sloping, with a thin mantle of latest Holocene alluvium and eolian silts overlaying silts and clays. Because older surfaces have been overlain with a thin layer of more recent materials that were deposited after human presence began in the area, there is a moderate to high likelihood for subsurface deposition within the lower-lying lake basin portion. Because episodes of filling and emptying of Lake Cahuilla that have occurred at various times in prehistory would have moved and disturbed soils at or near the surface of the lake basin landform, archaeological features preserved there will likely be disturbed or fragmentary (URS 2009). Soils within the lower lake basin are made up of thick deposits of gray fine sand and silt that may be a combination of Colorado River supplied lake sediments and fines flushed into the lake by streams and washes that once terminated nearby at the shoreline.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar, 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists of primary, secondary, and tertiary flakes, and a weathered edge modified flake tool and single core that shows evidence of having been used as a hammerstone. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Nearly all flakes observed at this site are larger than the raw lithic material on site where only gravels of maximum dimension of approximately 5 centimeters occur. However, site DRK-139, recorded approximately 175 meters to the west of DRK-140, is a lithic scatter site situated on a patch of desert pavement and would appear to be the nearest source of suitable lithic material of the same basic types observed on DRK-140. It is quite possible, if not likely, then, that cobble materials of the pavement occurring at DRK-139 was the source of the materials reduced at DRK-140. Based on the constituents and relative proximity of primary stone materials DRK-140 appears to represent a single reduction locality or episode; but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. DRK-140 is situated within the lake basin, which has a moderate to high likelihood for subsurface deposition. However, the episodes of filling and emptying of Lake Cahuilla that have occurred at various times in prehistory have moved and disturbed soils at or near the surface of the site. Therefore, archaeological features preserved within this site are likely disturbed or fragmentary.

Due to the low density of artifacts and the low probability for intact, significant subsurface deposits, the data potential for this site is considered exhausted.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria. In addition, DRK-140 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

DRK-141

DRK-141 is an amorphous-shaped prehistoric lithic scatter with one hearth feature that covers a total surface area of 1,546.5 square meters. The site is located in the eastern portion of the laydown staging area of the Proposed IVS Project. The site is situated atop intact desert pavement that is moderately developed within the lower lake basin which is a geomorphic sublandform to the lake basin geomorphic landform, indicating a Late Pleistocene/Early Holocene period of formation (URS 2009). Observed profiles in this area indicate that the soils are made up of thick deposits of gray fine sand and silt that may be a combination of Colorado River supplied lake sediments and fines flushed into the lake by stream/wash that once terminated nearby at the shoreline. Vegetation species on the site include creosote.

This lithic scatter and fire affected rock/hearth site measures 59 meters north to south by 55 meters east to west and contains a total of 22 artifacts. The site consists of one hearth (Feature 1) and one concentration interpreted to be a single lithic reduction locus with eight artifacts, plus fourteen additional artifacts observed outside the locus and feature. The prevailing cultural constituents within this site consist of prehistoric artifacts. Artifact density at DRK-141 is low with a calculated distribution of approximately one artifact per 67.24 square meters. The overall condition of the site is fair due to off-highway vehicle tracks which run through in a north-south direction.

The site contains one hearth feature, one lithic reduction loci and a total of 22 artifacts, which include: 19 metavolcanic flakes (eight primary, eight secondary and three tertiary flakes), two metavolcanic cores, and one edge modified metavolcanic flake.

Feature 1 is the site datum and is located in the southern portion of the site. It measures 4.5 meters north to south by 3.5 meters east to west. The feature is interpreted to be the remains of a hearth consisting of approximately 40 pieces of fire affected rock situated on a slightly raised mound. No artifacts are associated with the feature.

Locus 1 is located on the northeastern boundary of the site. Locus 1 measures three meters north to south by 1.5 meters east to west. Artifacts observed within Locus 1 include: seven metavolcanic flakes (four primary, two secondary and one tertiary) and one metavolcanic core.

Artifacts observed within 30 meters and outside the locus consist of: 12 metavolcanic flakes (four primary, six secondary and two tertiary flakes), one metavolcanic core and one edge modified metavolcanic flake. The further character of artifacts associated with DRK-141 is unreported.

The more particular physical context for DRK-141, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be within the lower lake basin which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating a Late Pleistocene/Early Holocene period of formation. The lake basin geomorphic landform consists of two distinct components: the lower lake basin and the beach zone or interface between the lake basin and the fan apron. The surface of the lower lake basin is generally very flat to very gently sloping, with a thin mantle of latest Holocene alluvium and eolian silts overlaying silts and clays. Because older surfaces have been overlain with a thin layer of more recent materials that were deposited after human occupation began in the area, there is a moderate to high likelihood for subsurface deposition within the lower-lying lake basin portion. Because episodes of filling and emptying of Lake Cahuilla have occurred at various times in prehistory that would ultimately have moved and disturbed soils at or near the surface of the lake basin landform, archaeological features preserved there will likely be disturbed or fragmentary. Soils within the lower lake basin are made up of thick deposits of gray fine sand and silt that may be a combination of Colorado River supplied lake sediments and fines flushed into the lake by streams and washes that once terminated nearby at the shoreline.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists primarily primary flakes and metavolcanic cores. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic reduction site are of the same primary stone material (metavolcanic) that is a constituent of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least one single-reduction locality or episode. It should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Archaeologists for the applicant interpret that the presence of a hearth feature or fire-affected rock is evidence of resource processing and/or other activities. Hearth features found in association with lithic debitage could be evidence of more complex lithic resource processing activities. Lithic materials intended for flaked tool production were sometimes heat-treated using open hearths in order to improve the flaking characteristics of the stone. Additionally, open hearths were used in prehistory for various other purposes such as parching seeds and grains, cooking, and to provide personal warmth. Such features may also represent sacred/ritualistic activities associated with cremating the deceased and/or animals. No burnt/calcined bone of any kind was observed within the site or feature. The conspicuous absence of any evidence of carbon residue and the paucity of artifacts would support the hypothesis that DRK-141 is a surface phenomenon that resulted from a single episode of use.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. Because this landform was formed during a period of prehistoric human presence, there is a moderate to high likelihood for subsurface deposition within the lower-lying lake basin portion. However, the episodes of filling and emptying of Lake Cahuilla that have occurred at various times in prehistory would have moved and disturbed soils at or near the surface of the lake basin landform, therefore archaeological features preserved at DRK-141 appear to be disturbed and fragmentary. In addition there is no visible charcoal or staining on the surface, therefore no carbon-14 sample can be extracted for chronometric dating and given the high deflation rate of the hearth situated within the shoreline which likely removed the potential for subsurface deposition.

As a result, DRK-141, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, DRK-141 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

DRK-146

DRK-146 is an amorphous-shaped historic refuse deposit that covers a total surface area of 9,435 square feet. The site is located within the eastern portion of the laydown area of the Proposed IVS Project. The site is situated atop a distal alluvial fan within the lower lake basin which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating a Late Pleistocene/Early Holocene period of formation (URS 2009). Observed profiles in this area indicate that the soils are made up of thick deposits of gray fine sand and silt that may be a combination of Colorado River supplied lake sediments and fines flushed into the lake by streams and washes that once terminated nearby at the shoreline. Vegetation species on the site include creosote, burroweed and bunch grass.

This historic refuse deposit measures 353 feet east to west by 244 feet north to south, and contains a total of approximately 600 historic artifacts. It consists of five concentrations interpreted to be five historic refuse loci, with 385 artifacts and 215 additional artifacts observed outside the loci. The prevailing cultural constituents within this site consist of historic artifacts. Artifact density at DRK-146 is low, with a calculated distribution of one artifact per 4.8 square meters. The overall condition of the site is good.,

This site consists of five historic refuse loci and a total of approximately 600 artifacts, which includes: 254 cans (cone top, church key opened, friction, match stick, removable lid, removable lip lid, sanitary and tobacco), more than 200 glass fragments (green, colorless, cobalt, white from soda, liquor, medicine bottle), condiment and food jars, drinking glasses, laundry hangers, bailing wire, stoneware (printed) plates and bowls, yellow and red Bauer ware, crockery, a bucket, Purex bottle fragments, improved white ware, embossed white ware, crown cap neck bottles, salt glazed ceramics and glass bottles with maker's marks.

Locus 1 is located in the southern portion of the site boundary and measures 17 feet east to west by 23 feet north to south. Artifacts observed within Locus 1 include: over 60 solder dot/ crimp lid condensed milk cans, church keyed beer cans, brown and colorless bottle glass with Pierce Glass Company maker's mark.

Locus 2 is located 124 feet northeast of Locus 1 and measures 40 feet north to south by 40 feet east to west. Artifacts observed within Locus 2 include: 109 cans, including solder dot/crimp lid condensed milk cans, church keyed beer cans, baking soda, vegetable cans, Italian plant pot sherds, improved white ware fragments, embossed white ware fragments, blue Milk of Magnesia glass, crown cap neck colorless bottle, brown, and colorless bottle glass and salt glazed ceramics. The maker's marks present in this locus include Owens-Illinois Glass Company, Knox Glass Bottle Company and Glass Containers Inc.

Locus 3 is located 59 feet east of Locus 2 and measures 13 feet north to south by 30 feet east to west. Artifacts observed within Locus 3 include: two sanitary cans, red Bauer ware bowl sherds, screw cap colorless glass jar fragments, brown Purex bottle fragments and a bottle.

Locus 4 is located 39 feet southeast of Locus 3 and measures 58 feet north to south by 49 feet east to west. Artifacts observed within Locus 4 include: 30 cans (five church key, one removable lid, one removable lip lid, six sanitary milk cans, 15 sanitary food cans and two Prince Albert pin hinge), three ceramic crockery fragments, 10 glass fragments (five colorless soda bottle fragments, four brown liquor fragments and one colorless condiment fragment), two laundry hangers, two segments of bailing wire and one bucket.

Locus 5 is located 200 feet northwest of Locus 4 and measures 11 feet north to south by 12 feet east to west. Artifacts observed within Locus 5 include: a small glass scatter of 138 glass fragments (20 cobalt medicine bottle fragments, 10 green liquor bottle fragments, 82 colorless soda jar fragments, five milk-white cosmetic jar fragments and 21 brown liquor fragments).

Those artifacts observed within 30 meters and outside the loci consist of two cone top beverage cans, two church key opened beverage cans, two friction top food tins, two match stick milk cans, one removable lid can, one removable lip lid can, 32 sanitary cans, five stoneware plate sherds and three stoneware bowl fragments. The further character of artifacts found within DRK-146 is unreported.

The more particular physical context for DRK-146, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be within the lower lake basin which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating a Late Pleistocene/Early Holocene period of formation. The lake basin geomorphic landform consists of two distinct components: the lower lake basin and the beach zone or interface between the lake basin and the fan apron. The surface of the lower lake basin is generally very flat to very gently sloping, with a thin mantle of latest Holocene alluvium and eolian silts overlaying silts and clays. Because older surfaces have been overlain with a thin layer of more recent materials that were deposited after human occupation began in the area, there is a moderate to high likelihood for subsurface deposition within the lower-lying lake basin portion. Soils within the lower lake basin are made up of thick deposits of gray fine sand and silt that may be a combination of Colorado River supplied lake sediments and fines flushed into the lake by streams and washes that once terminated nearby at the shoreline.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret that deposits of historic artifacts such as the ones found at DRK-146 typically represent episodes of refuse disposal after initial discard in another location (dumping) or discard and/or loss of individual articles in situ. In the case of DRK-146, the very large number of artifacts and artifact types present would more likely have resulted from dumping. Additionally, the specific artifact types present would be consistent with those expected in an assemblage of common household refuse. Though dates of manufacture can be determined for some of the artifacts present at DRK-146, the time between the initial use/consumption of the artifacts and their ultimate disposal cannot be known, so the specific date of their disposal cannot be reliably determined.

Various artifacts present at DRK-146 have diagnostic characteristics from which their dates of manufacture can be approximated. A colorless bottle base found in Locus 1 with a Pierce Glass Company maker's mark can be attributed to a time period beginning in 1905 and extending into the 1980s (Goodman 2002). Another bottle base found in Locus 2 with an Owens-Illinois maker's mark was manufactured sometime between 1929 and 1954 Goodman 2002). Also present in Locus 2 is a bottle base with a Knox Glass Company maker's mark dating to between 1935 and 1953, and another bottle base with a Glass Container Incorporated maker's mark dating from between 1945 to present (Goodman 2002). Additionally, cone top beverage cans were found at this site, which is a style of container that was first produced in 1935 and stopped being produced in the 1950s.

Based on the discrete nature of the five loci at DRK- 146, it is likely that the at least five separate episodes of dumping took place there. Because of the wide range of potential manufacture dates of artifacts present at DRK-146, it can only be confidently stated that the first date of deposition could have been as early as 1945 and may have actually occurred at any time since then.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. Although, based on the landform on which DRK-146 is located, there is a greater potential of the presence of subsurface archaeological deposits, much of the geomorphic activity has occurred throughout prehistory. Therefore, there is no reason to expect that there might be buried components to relatively recent sites such as DRK- 146. If shorter-term taphonomic processes have shallowly buried some of the deposits at DRK-146, the buried portions of the deposit would likely have the same basic characteristics as those visible on the surface. As a result, the data potential of DRK-146 is considered exhausted through recordation.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, DRK-146 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

JF-030

JF-030 is an oval-shaped historic/modern refuse deposit that covers a total surface of 2510 square feet. The site is located within the eastern portion of the Laydown area of the Proposed IVS Project area. The site is situated atop an alluvial deposit of fine grain silicate matrix within the lower lake basin which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating a Late Pleistocene/Early Holocene period of formation (URS 2009). Observed profiles in this area indicate that the soils are made up of thick deposits of gray fine sand and silt that may be a combination of Colorado River supplied lake sediments and fines flushed into the lake by stream/wash that once terminated nearby at the shoreline. Soils are loose sands and aeolian sediments with no desert pavement. Vegetation on the site includes creosote, mesquite and ironwood trees.

This historic site measures 69 feet east to west by 50 feet north to south, and contains a total of approximately 311 historic/modern artifacts. The site also contains one cryptocrystalline silicate jasper secondary flake. The prevailing cultural constituents within this site consist of historic/modern refuse. Artifact density at JF-030 is low, with a calculated distribution of one artifact per eight square feet. The overall condition of the site is poor due to alterations by modern trash, off-highway vehicle tracks that run along the northeast boundary and a berm associated with road grading activity, which runs east to west across the southern portion of the site.

The artifact types and materials present at JF-030 include 150 fragmented or whole glass artifacts, 103 metal artifacts, 23 cans, 12 historic ceramic fragments, and miscellaneous historic/modern refuse (oil filters, strap iron, metal sheeting, toys, butchered faunal bone, light bulb, sewage pipe, wire coils, construction materials and bricks). The site also contains one cryptocrystalline silicate jasper secondary flake.

A total of 150 glass fragments were observed within the site and include: one colorless crown cap finish bottle, one colorless flask fragment with a base mark of 392 and heel mark FOUR-FIFTHS, one colorless flask base with the base mark D1 89/I inside an O and a diamond/64-8, one colorless flask base with the base mark D1/I inside an O and a diamond/64-9, one colorless flask fragment with the base mark L/M in a circle/4, one colorless flask fragment with the base mark 7/560/P in a circle, one colorless bottle base with the base mark NOT TO BE/2 G interconnected with a C/REGISTERED/1095/REFILLED, one colorless bottle base with the base mark 23 I in an O and a diamond 7, one colorless bottle base with the base mark TABLE PRODUCT INC./a G interconnected with a C/3833/REG. CAL/LOS ANGELES, one colorless bottle base with the base mark TABLE PRODUCTS/a G interconnected with a C/3542/REG. CAL/LOS ANGELES, one colorless tumbler/cup fragment with the base mark 3, one colorless flask fragment with the base mark 04.../576/I inside an O with a diamond/0954 and the heel mark HALF PINT, one colorless bottle base with the base mark SUN/36 with 256 embossed over the U, one colorless bottle base fragment with the base mark 0 9476/H over an A/4, 53 fragments are from one green glass bottle with a crown cap finish and texturized neck and the base mark WHITE ROCK/Duraglas in cursive/23 I in an O with a diamond 51/3C/2575-C, 45 fragments are from one colorless Dr. Pepper bottle with crown cap finish, a red and white applied color label 10 2/Dr. Pepper/4 and the base mark LG 70/44855, one colorless milk bottle with a red and white applied color label Armstrong Certified/Dairy/image of a strong arm, one brown bottle base with the base P C G P inside a cross, two are brown bottle bases with the base mark REG. US/CLOROX in a diamond/PAT. OFF., one milk glass toiletry jar with the base mark H over an A, four milk glass bottle fragments, three cobalt glass fragments, four manganese decolorized glass fragments, one light pink depression glass decorative bowl, one decorative vase finish bottle, and 20 window pane fragments.

Cans present at the site consist of one sanitary church key-opened can, two hole-in-top cans with a diameter of 2.094 inches and a height of 3.094 inches, and 10 to 20 unidentifiable cans including quart size, gallon size, pint size and smaller. This site also contains a ceramic assemblage of five porcelain fragments (one jar and four pieces of a plate with a scalloped edge and blue rim) and seven terra cotta fragments. Miscellaneous refuse at the site consists of 50-100 wire coil fragments, construction materials (six bricks), toys (metal truck model and four wheel roller skates), one light bulb, 11 sewage pipe fragments, one strap iron-metal sheeting chicken wire window screen, one butchered faunal bone fragment, and one oil filter. The further character of artifacts associated with JF-030 is unreported.

The more particular physical context for JF-030, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be within the lower lake basin which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating a Late Pleistocene/Early Holocene period of formation. The lake basin geomorphic landform consists of two distinct components: the lower lake basin and the beach zone or interface between the lake basin and the fan apron. The surface of the lower lake basin is generally very flat to very gently sloping, with a thin mantle of latest Holocene alluvium and eolian silts overlaying silts and clays. Because older surfaces have been overlain with a thin layer of more recent materials that were deposited after human occupation began in the area, there is a moderate to high likelihood for subsurface deposition within the lower-lying lake basin portion. Because episodes of filling and emptying of Lake Cahuilla have occurred at various times in prehistory that would have ultimately moved and disturbed soils at or near the surface of the lake basin landform, archaeological features preserved there will likely be disturbed or fragmentary. Soils within the lower lake basin are made up of thick deposits of gray fine sand and silt that may be a combination of Colorado River supplied lake sediments and fines flushed into the lake by stream/wash that once terminated nearby at the shoreline.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret that deposits of historic artifacts such as the ones found at JF-030 typically represent episodes of refuse disposal after initial discard or discard and/or loss of individual articles in situ. In the case of JF030, the large number of artifacts and artifact types present would likely have resulted from the dumping of a wide range of artifact types that would be expected in an assemblage of common household refuse. Though dates of manufacture can be determined for some of the artifacts present at JF-030, the time between the initial use/consumption of artifacts and their ultimate disposal cannot be known so the specific date of their disposal cannot be reliably determined.

A small number of artifacts at JF-030 possess specific makers' marks, labeling styles, and evidence of manufacturing technologies from which general dates of manufacture can be determined. Two bottle bases display a maker's mark for Glass Container Corporation that was in use from 1945 until some time after 1971 (Goodman 2002). Two bottle bases have a Hazel Atlas maker's mark that is found on bottles manufactured between 1920 and 1964 (Goodman 2002). Owens-Illinois Company included a date code on their bottle bases so more accurate dates of manufacture can sometimes be determined. One such bottle base present has a date code of "7" indicating that it was manufactured in either 1937 or 1947, another has a date code of "9" meaning that it was manufactured in either 1939 or 1949, and yet another has a date code "8" from which can be inferred that it was manufactured in either 1938 or 1948 (Owens Illinois did not switch to two digit date codes until the 1950s - Lockhart 2004). Another bottle base is from a White Rock bottle and has the Owens Illinois Duraglas maker's mark with a date code of "51", indicating that it was manufactured in 1951 (Lockhart 2004). Additionally present but less temporally diagnostic are hole-in-top cans, which were common from the 1880's to the 1 940s and where can assemblages are predominated by this type of can in the western states, typically date to the 1 920s (Goodman 2002). Also present were four manganese decolorized glass fragments. Beginning circa 1880 manganese was added to glass to change its natural aqua color to clear. That addition had the unintended effect of turning the glass a particular amethyst color when exposed to ultraviolet light for extended periods of time. Such glass is termed "sun-colored-amethyst" (Goodman 2002:1) glass (SCA) and its manufacture predates 1920 when the practice of adding manganese ended (Goodman 2002). Based on these data it would follow that the deposition of artifacts at JF-030 could have occurred as early as 1945 or as late as sometime in the 1970s. Lastly, a single cryptocrystalline jasper secondary flake was present at the site. Archaeologists for the Applicant interpret the presence of this artifact to be anomalous and that it does not indicate the presence of a substantial prehistoric component at the site.

Although this site does possess artifacts with temporally diagnostic characteristics, those characteristics serve to date the manufacture of the objects rather than the date of deposition at the site, therefore the material remains cannot definitively be associated with a specific portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. Additionally, there is no evidence in the geomorphic study (URS 2009) or visible at the site that would indicate that there is reasonable potential for the presence of buried historic era archaeological deposits.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, JF-030 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

200 FOOT BUFFER

EBR-083

EBR-083 is a single rock cluster feature. The feature is located within the southern central extent of the 200 foot buffer project boundary of the Proposed IVS Project. The site is atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. Vegetation is not present on the site.

This historic/modern rock cluster site measures three feet north to south by three feet east to west. The rock cluster is constructed of 18 rocks of various source material (metavolcanic and granite); the diameter of rocks used range from five centimeters to 18 centimeters.

There are no artifacts present associated with the single feature that comprises this site.

The more particular physical context for EBR-083, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be a very old fan surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for Early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret that although the rock cluster present at EBR-083 has characteristics similar to survey markers in the area, it cannot be conclusively identified as such. The size of the cluster and of the stones that comprise it conforms approximately to those surrounding General Land Office (GLO) survey benchmarks found in the region, but this feature is not located on a current section or quarter section corner point.

It is, however, located on the dividing line between two sections and therefore the rock cluster could be the remains of a witness mark placed by GLO surveyors. When GLO cadastral surveys were conducted in the project area in the early 20th century, survey standards allowed for the placement of witness marks within 20 chains (1320 feet) of the actual location of a section corner if, "prevailing conditions would assure its destruction by natural causes" (White 1991:619). This rock cluster is precisely located on the dividing line between two sections and lies within 20 chains of the closest section corner.

However, according to procedures, a witness marker should be inscribed with the initials, "WP" (Witness Point) and the distance and direction to the section corner. It is possible that such an inscription existed at one time but was missing or not readily visible when the site was examined during this survey effort. Additionally, expediently constructed stone clusters can also be markers of mining claims or homestead boundaries. Mining claim markers sometimes contain tobacco tins to hold copies of official records substantiating the claim. Such a tin was not evident at this stone cluster.

No temporally diagnostic historic artifacts were found and it seems unlikely that the feature contains cultural materials and does not exhibit characteristics which would indicate prehistoric age. Given the structure of the cairn, it is noteworthy that this stone cluster cannot be definitively determined to be historic in age. The site is situated within a large recreational area which is frequently used by off-highway vehicles. It is possible that the stone cluster is modern in age and perhaps was expediently placed to provide a visible landmark to facilitate navigation.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. EBR-083 is situated atop a subordinate landform characterized as a very old fan surface within the fan piedmont land form. The fan piedmont land form is an isolated exposure surrounded by the fan apron land form that has been determined to have the same geomorphological characteristics as the fan piedmont (URS 2009: CUL-6). This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits, therefore data potential is considered exhausted through recordation of EBR-083.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, EBR-083 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

EBR-218

EBR-218 is an amorphous-shaped prehistoric archaeological site that covers a total surface area of 847 square meters. The site is located within the eastern extent of the 200 foot project boundary buffer of the Proposed IVS Project. EBR218 appears to be within multiple landforms and subordinate landforms, with an interface between the fan apron and shoreline, and the fan apron and fan piedmont. The site is situated on a younger (Late Holocene) fan apron within the fan apron/skirt geomorphic landform, which has a Late Pleistocene/Early Holocene period of formation (URS 2009). The surface area of the site consists of an open, low-lying, aeolian/fluvial wash within a younger fan apron with intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. The southern edge of the site is bordered by a very old fan surface within the fan piedmont geomorphic landform. In addition, along the north northeastern boundary, the site is situated atop the fan apron/beach interface with deflated beach sands within the beach zone, which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating Late Pleistocene/Early Holocene period of formation (URS 2009). The soils along the northern boundary consist of beach sands that are non-cohesive and vary from coarse sub-angular to rounded sand and small gravels to medium and coarse well rounded sands overlaid by fine silts and clays. The beach zone interface is determined by the beach sand void of cobbles and desert pavement. Vegetation species on the site include creosote, ocotillo, burroweed and desert trumpet.

This archaeological deposit measures 122 meters northeast to southwest by 17 meters east to west, and contains a total of 61 prehistoric artifacts and one non-associated historic artifact. It consists of two concentrations interpreted to be multiple activity loci. Artifacts observed between loci occur at lower frequency than observed within the concentrations. The prevailing cultural constituents within this site consist of prehistoric artifacts. Artifact density at EBR-218 is low, with a calculated distribution of one artifact per 13.66 square meters. The overall condition of the site is good, with the exception of several ephemeral gullies which cut through the site in north south directions.

This site contains two multiple activity loci and a total of 62 artifacts, which include: 25 green metavolcanic flakes (eight primary, three secondary, 13 tertiary and one piece of angular waste/shatter), one brown cryptocrystalline silicate chert tertiary flake, one black/gray cryptocrystalline silicate tertiary flake, one quartz tertiary flake, one quartzite primary flake, two basalt tertiary flakes, two granitic hammerstone, one green metavolcanic core tool, one quartzite core, one triangular mottled red and brown cryptocrystalline silicate jasper biface, one burnt sandstone metate fragment, 23 buffware body sherds, one brownware body sherd and one historic lard bucket measuring 15 inches in diameter.

Locus 1 is located in the southern portion of the site and measures 12 meters north to south by five meters east to west. Artifacts observed within Locus 1 include: 16 green metavolcanic flakes (seven primary, two secondary, six tertiary and one shatter), one brown cryptocrystalline silicate chert tertiary flake, one quartzite primary flake, one quartzite unifacial core, one granite hammerstone, one burnt sandstone metate fragment, one triangular mottled red and brown cryptocrystalline silicate jasper biface and 10 buffware ceramic sherds.

Locus 2 is located 41 meters north of Locus 1 and measures three meters north to south by two meters east to west. Artifacts observed within Locus 2 include: three green metavolcanic flakes, one brownware ceramic sherd and five buffware ceramic sherds.

Those artifacts observed within 30 meters and outside of the loci consist of: six green tertiary metavolcanic flakes (one primary, one secondary and four tertiary), one granitic hammerstone, one green metavolcanic core tool, one quartz tertiary flake, one black/gray cryptocrystalline silicate tertiary flake, two basalt tertiary flakes, eight buffware ceramic sherds and one non-associated historic lard bucket measuring 15 inches in diameter. The further character of artifacts found within the site is unreported.

The more particular physical context for EBR-218, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be within multiple landforms and subordinate landforms, which include fan apron within the fan apron/skirt, fan piedmont, beach zone, and interfaces between these landforms. The surface and subsurface aspects of this landform are dominated by a younger (Late Holocene) fan apron within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation. The surface consists of finer grain material eroded from the fan piedmont that has formed a number of fan “aprons” which do not individually fully cover the entire area, and which interfinger and partially bury one another and piedmont remnants. The lack of soil development within the capped alluvial unit, and the similar degree of pavement development between the two units, suggests that this buried portion of the lower alluvial fan deposit may not have been exposed at the surface for an appreciable amount of time; thus reducing the potential for extensive buried archaeology on that surface. Nonetheless, this area does demonstrate the potential for (shallowly) buried preserved surfaces, but there is a high likelihood these deposits will represent the same constituents recorded on the surface. As a result, there is a very low to moderate likelihood for subsurface deposition, though the particular physical context of the site's being situated on a younger fan may increase that potential. The desert pavement consists of small to large, sub-rounded to sub-angular metavolcanic, basalt, quartz, quartzite and granite gravels and cobbles overlaying coarse sands, silts, and fine gravels.

The southern boundary is situated on distal fan apron/fan piedmont interface within the fan piedmont with a very old fan surface. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007); therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Along the north northeastern boundary, the site is situated atop distal fan apron/beach interface within the beach zone which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating Late Pleistocene/Early Holocene period of formation (URS 2009). The lake basin geomorphic landform consists of two distinct components: the lower lake basin and the beach zone or interface between the lake basin and the fan apron. The land surface of the beach zone consists of beach flats and deflated beach sands that are consistent with the multiple formation and recessional events of the maximum Lake Cahuilla shoreline. Because the advance and recession of the waters of Lake Cahuilla at various times in prehistory would have moved surface soils within the beach zone, the potential for subsurface deposition is heightened. The soils within the beach zone consist of sands that are non-cohesive and vary from coarse sub-angular to rounded sand and small gravels to medium and coarse well rounded sands overlaid by fine silts and clays. The beach zone interface is evidenced in EBR-218 by beach sand void of cobbles and desert pavement located along the northern boundary of the site.

Additionally, there is a wash along the southwestern margin of the site. In that area the soils are light tan sand with gravels and cobbles.

Ceramics found at this site comprise about 40 % of the total artifacts observed, with the vast majority being buffware sherds and a single brownware sherd. Data gathered on ceramics in the area surrounding EBR-218 show evidence of a variety of ceramic types and techniques. Though paddle-and-anvil construction techniques were common among groups using this area, the tempers employed, vessel types manufactured, and decoration did vary between groups. The Diegueño used ground clay and did not add temper when manufacturing ceramics. They created a variety of vessels including ollas; bowls, cooking pots, and pipes. The Kamia sometimes added rose quartz as temper and produced the greatest variety of ceramics among the Yuman bands, including ollas, jars, canteens, bowls, rattles, plates, scoops, cups, and parchers. Kamia ceramics were painted after firing with red and/or black designs. The Cocopah used ground and winnowed clay tempered with ground sherds to create a variety of vessels used for storage and cooking. Quechan vessel types include bowls, parchers, cooking pots, small figurines, and large storage vessels that were used to float goods across rivers (URS 2009). Currently, the primary ethnic groups known to have occupied region surrounding EBR-218 include the Diegueño and Kamia. Other groups known to have used/traveled/inhabited the area includes the Tipai, Cocopa, Kumeyaay, Ipai, Quechan, Paipai and Cahuilla (Luomala 1978; Schaefer and Laylander 2007; URS 2009). In approximately AD 1200, the course of the Colorado River changed, refilling Lake Cahuilla and providing a stable water source and drawing people from surrounding regions to repopulate the Colorado Desert. Ceramic wares which were introduced centuries before in other areas were brought into this region at that time (URS 2009). However, it has been argued that stable populations around the lake developed their own distinctive pottery formulas that became regional expressions of their families and locales (May ND). Although these groups each had specific approaches to the creation of ceramics, ceramic vessels were also traded along with subsistence resources and other items, infusing some uncertainty into the use of data from ceramics to associate one particular area with a particular tribal group or family. Therefore, it is unlikely that surface data could directly relate EBR-218 or the area surrounding it to a particular tribe.

Of the cultural constituents found in EBR-218, 50 % were primarily lithic reduction in nature with 31 of the total artifacts observed being flakes. Lithic constituents found consist primarily of tertiary flakes, a unifacial core and two granitic hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this multi-component site are of the same primary stone (green metavolcanic) material that is a constituent of the surrounding area, and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent two multi-activity localities or episodes; but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time. The presence of flaked stone tools, one triangular mottled red and brown cryptocrystalline silicate jasper biface and one green metavolcanic core tool, within EBR-218 also represents resource procurement and/or processing of faunal or floral resources. The creation of flaked stone tools such as the cryptocrystalline silicate jasper biface present at EBR-218 requires additional lithic technologies, possibly including bifacial thinning and pressure flaking to shape and refine cutting edges.

Ground stone present at this site includes a single potentially fire-affected metate fragment. Ground stone tools were made by grinding, abrading, pecking, pounding, and polishing rather than chipping and flaking. Ground stone tools found in the area surrounding EBR-218 include manos and metates (sometimes referred to as milling stones). Metates in this area are typically flattish slabs and manos were smaller, loaf-shaped stones that were moved in a circular motion against the metate in order to grind small seeds and other food resources. Both manos and metates were primarily constructed from coarse-grained stone such as sandstone or granite. Manos and metates are associated with subsistence procurement and/or processing (Chartkoff and Chartkoff 1984).

Evidence that the mano described above has been fire-affected may indicate that a hearth feature was once present at EBR-218. Hearth features or fire-affected rocks are evidence of resource processing and/or other activities. Hearth features found in association with lithic debitage could be evidence of more complex lithic resource processing activities. Lithic materials intended for flaked tool production were sometimes heat treated using open hearths in order to improve the flaking characteristics of the stone. Additionally, open hearths were used in prehistory for various other purposes such as parching seeds and grains, cooking, and to provide personal warmth. Such features may also represent sacred/ritualistic activities associated with cremating the deceased and/or animals.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret sites such as EBR-218, with richer assemblages containing ceramics in association with hearth features and artifacts, such as groundstone and lithic tools, as places where subsistence procurement and processing activities occurred; and it is possible that sacred or ritual activities occurred there as well.

Historic artifacts such as the one historic lard bucket found at EBR-218 typically represent a single episode of refuse disposal or discard and/or loss of individual articles in-situ. In the case of EBR-218, the most likely explanation of the presence of a single artifact lard bucket would appear to represent a single instance of in-situ disposal or the artifact may have been displaced from its original context through erosional processes. The artifact cannot be temporally associated with any other artifacts present at the site, possesses no discernable maker's mark, nor is it of any diagnostic style or construction technique; therefore, it has no potential to provide meaningful information concerning any portion of prehistory or history.

Because this site contains artifacts with unique or temporally diagnostic characteristics and the material remains may be associated with a specific portion in prehistory. This site cannot reliably be associated with any distinctive or significant event, person, design, or construction; and analysis of artifact distribution has been accounted for during the recordation process. Since this site contains artifacts with unique or temporally diagnostic characteristics, the material remains may provide information that can be attributed to a specific portion of prehistory. Although EBR-218 is primarily located within the fan apron/skirt geomorphic landform, which indicates a Late Pleistocene/Early Holocene period of formation and usually has a very low to moderate likelihood for subsurface deposition, its particular location is on a younger fan apron, which may have formed during the Late Holocene, which increases the possibility that subsurface deposits might be present. The southern edge of the site is situated within the transition with a subordinate landform characterized as an older fan surface with alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform indicates a Pleistocene (or older) period of formation, and because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits. The northern edge of the site is located within the beach zone. This landform was formed by the advance and recession of the waters of Lake Cahuilla at various times in prehistory moving surface soils within the beach zone. Therefore, there is a moderate to high potential for subsurface archaeological deposits within the beach zone.

Further analysis of the geographic location of this site reveals that it is located on the high water line of the maximal potential filling of prehistoric Lake Cahuilla. Four events of maximal filling of Lake Cahuilla have occurred between AD 700 and AD 1540. An additional partial filling has been proposed to have occurred sometime between A.D. 1516 and 1659 (Cleland et al. 2000). Based on the precise alignment of the eastern edge of EBR-218 with the proposed high water mark of Lake Cahuilla, it is likely that the site existed during or before the most recent complete filling episode, which began around AD 1430 and was fully receded by AD 1540. Based on the cultural constituents and location of the site, there exists the potential for buried preserved surfaces, but there is a high likelihood these deposits will represent the same constituents recorded on the surface. As a result, it is recommended that limited subsurface testing be conducted to assess whether subsurface deposits are present at EBR-218 before a recommendation of eligibility can be made.

In addition, because of the nature of potentially informative and diagnostic characteristics of lithics, groundstone, and ceramics found at EBR-218, the recordation of all potential data that might be derived from them requires the work of a specialist. It is recommended that a sample of artifact types found at EBR-218 be studied by a specialist so it can be determined if they do provide any additional data potential; and, if so, such data can be applied in making an eligibility determination. Due to characteristics of the artifact assemblage and features present at EBR-218, and its proximity to the Lake Cahuilla shoreline, it is considered a contributor to the proposed Lake Cahuilla High Water Mark District.

JFB-004

JFB-004 is a circular-shaped historic site that covers a total surface area of 63 square meters. The site is located within the western extent of the 200 foot project boundary buffer of the Proposed IVS Project. The site is situated within an active wash surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Vegetation species on the site include creosote.

This historic survey benchmark site measures 10 meters east to west by nine meters north to south, and contains a total of 18 historic artifacts and one historic feature. The prevailing cultural constituents within this site consist of wire fragments and wooden lathe fragments. Artifact density at JFB-004 is low, with a calculated distribution of one artifact per 3.5 square meters. The overall condition of the site is fair with some alterations caused by erosional processes due to active washes.

Artifacts observed at JFB-004 include 10 wire fragments and eight weathered wooden stake fragments (five of which are in situ). The artifacts are associated with a US General Land Office (GLO) benchmark (Feature 1).

Feature 1 is located in the center of the site and consists of a historic US GLO brass cap bench mark that reads: US GENERAL LAND OFFICE SURVEY! PENALTY $250 REMOVAL!T16S R10E (with 1!4 section info)! 191_ with associated guy wire anchor cairns that are composed of three to four stones each and five pieces of lathe in situ. The further character of artifacts associated with JFB-004 is unreported.

The more particular physical context for JFB-004, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be within an active wash surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting land form is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont. Areas of active erosion within the fan piedmont, such as where this site is located, do have a slightly greater potential for the presence of subsurface deposits where recent alluvium was deposited. Given the highly erosive nature of the fan piedmont it seems unlikely that such subsurface deposits would have been preserved. Furthermore, if subsurface cultural deposits were to be preserved under such isolated inset pediments, they would most likely be similar in quality and quantity of artifacts to those sites found on the surface in nearby remnant portions of the fan piedmont (URS 2009: CUL-8).

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as a General Land Office benchmark (cadastral survey corner benchmark). Benchmarks such as the one found in JFB-004 were placed by surveyors as a part of the Public Lands Survey System (PLSS). That system divided public lands into sections of one square mile (640 acres) and into quarter sections of 160 acres. The PLSS was created by the Land Ordinance of 1785, which declared that lands outside the then-existing states could not be sold, otherwise distributed, or opened for settlement prior to being surveyed (Stewart 1935).

Along with the Homestead Act of 1862 and the Desert Land Act of 1877, the PLSS helped facilitate the U.S. expansion westward in the late 19th and early 20th centuries. For unknown reasons, the date stamp on this particular benchmark was left blank when the benchmark was placed. Based on date stamps on other similar benchmarks observed in the area that bear the date "1912," this benchmark may have been placed during the same survey effort and therefore may date to the same time. However, there are no temporally diagnostic artifacts present at JFB-004 to confirm or deny that speculation.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. JFB-004 is situated within an active wash that is contained by the larger fan piedmont. This geomorphic landform indicates a Pleistocene (or older) period of formation. Due to the stability of this land form there is very low likelihood for subsurface archaeological deposits. Areas of active erosion within the fan piedmont, such as where this site is located, do have a slightly greater potential for the presence of subsurface archaeological deposits occurring where recent alluvium was deposited. Given the highly erosive nature of active washes within the fan piedmont, it seems unlikely that such subsurface deposits would have been preserved. Furthermore, if subsurface cultural deposits were to be preserved under such isolated inset pediments, they will most likely be similar in quality and quantity of artifacts to those sites found on the surface in nearby remnant portions of the fan piedmont (URS 2009: CUL-8). Therefore, data potential is considered exhausted through recordation of JFB-004.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, JFB-004 is not considered a contributor to an existing and/or proposed archaeological district or landscape. However, destruction of US GLO survey corner benchmarks is prohibited by law and therefore it is recommended that this benchmark be left undisturbed.

RAN-024

RAN-024 is an oblong-shaped lithic scatter that covers a total surface of 334 square meters. The site is located within the south central portion of the 200 foot buffer area of the Proposed IVS Project. The site is situated within an active wash surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of the site consists of intact desert pavement that is moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, and granitic gravels and cobbles. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. The site is bound by ephemeral gullies and ridgelines and is altered by natural erosion and weathering. Vegetation species on site include desert trumpet.

This lithic scatter site measures 45 meters north to south by 15 meters east to west, and contains a total of 17 prehistoric artifacts. It consists of one concentration interpreted to be one single reduction locus, with 13 artifacts and four additional artifacts observed outside the locus. The prevailing cultural constituents within this site consist of prehistoric lithic reduction debitage. Artifact density at RAN-024 is low, with a calculated distribution of one artifact per 19.65 square meters. The overall condition of the site is fair due to natural erosional and deflationary processes.

The site contains one lithic reduction locus and a total of 17 artifacts (13 associated with the loci), which include: 12 metavolcanic flakes (seven secondary and five tertiary), one tested cryptocrystalline silicate chert cobble, one metavolcanic multidirectional core and three metavolcanic hammerstones.

Locus 1 is located 24 meters north of the site datum and measures one meter north to south by one meter east to west. Artifacts observed within Locus 1 include 12 metavolcanic flakes (seven secondary, five tertiary) and one metavolcanic multidirectional core.

Those artifacts observed within 30 meters and outside of the locus consist of one tested cryptocrystalline silicate chert cobble and three metavolcanic hammerstones. The further character of artifacts within RAN-024 is unreported.

The more particular physical context for RAN-024, extrapolating information from Data Response 112, Figure 4 (URS 2009) to the location of the site, appears to be within an active wash surface within the fan piedmont. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007).

Therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont. Areas of active erosion within the fan piedmont such as where this site is located do have a slightly greater potential for the presence of subsurface deposits such as would occur where recent alluvium was deposited. Given the highly erosive nature of the fan piedmont it seems unlikely that such subsurface deposits would have been preserved. Furthermore, if subsurface cultural deposits were to be preserved under such isolated inset pediments, they will most likely be similar in quality and quantity of artifacts to those sites found on the surface in nearby remnant portions of the fan piedmont (URS 2009: CUL-8).

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists primarily of secondary and tertiary flakes, one multidirectional core, and three hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker

1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone (metavolcanic) material that is a constituent of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent one single reduction locality or episode, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction; and analysis of artifact distribution has been accounted for during the recordation process.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, RAN-024 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

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RAN-412C

RAN-412C is an amorphous lithic and ceramic scatter that covers a total surface of 34,991 square meters. The site is situated primarily atop lake basin sediments within the lower lake basin which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating a Late Pleistocene/Early Holocene period of formation (URS 2009). Observed profiles in this area indicate that the soils are made up of thick deposits of gray fine sand and silt that may be a combination of Colorado River supplied lake sediments and fines flushed into the lake by streams and washes that once terminated nearby at the shoreline (URS 2009). RAN-412C shows evidence that it is being inundated from the south by recent (latest Holocene) alluvium and beach/lake basin interface soils that appear to have characteristics of the nearby beach zone. The surface area of the site consists of beach sands that are non-cohesive and vary from coarse sub-angular to rounded sand and small gravels to medium and coarse well rounded sands overlaid by fine silts and clays. Vegetation species on the site include creosote, mesquite, and saltbush.

This ceramic and lithic scatter site measures 427 meters north to south by 234 meters east to west, and contains a total of approximately 419 prehistoric artifacts. Due to the extent of the site the area of potential effect (sample area) was inventoried and individual artifacts mapped. Reconnaissance survey was conducted to identify site extant and a sample unit (SSU-1) was placed to extrapolate overall density and constituents observed with higher density. The portion of the site inventoried with mapped artifacts consists of one concentration interpreted to be a multiple use locus with 270 artifacts and 149 additional artifacts were observed outside the locus. Therefore the areas between loci and features are not void of artifacts, yet they occur at a much lower density than those within the locus and SSU. The prevailing cultural constituents within this site consist of prehistoric ceramic artifacts. Artifact density at RAN-412C is low, with a calculated distribution of one artifact per 84.5 square meters. However, the artifact density within Locus 1 (represented by SSU 1) portrays a much higher concentration of approximately 5.5 artifacts per square meter. The overall condition of the site is fair with some alterations due to off-highway vehicle (OHV) activity and many ephemeral drainages associated with the larger active wash that bound the site to the east.

Artifact types and materials occurring within the site include; 53 metavolcanic flakes (five primary, 21 secondary, eight tertiary, 19 shatter) and three metavolcanic tested cobbles; 14 black metavolcanic flakes (three primary, four secondary, two tertiary) plus two multidirectional cores and two unidirectional cores of the same material; 18 green metavolcanic flakes (four primary, nine secondary, five tertiary), with two cores (one unidirectional and one multidirectional), and one tested cobble of the same material type; four cryptocrystalline silicate flakes (two secondary, two tertiary), one basalt primary flake, and two quartzite primary flakes; two quartz unidirectional cores, one tested cobble and one primary flake of quartz; one basalt multidirectional core, tested cobble and tertiary flake; one cryptocrystalline silicate multidirectional core, and five utilized flakes. The ceramic component of Locus 1 includes 176 Colorado buffware (17 rim and 159 body sherds) and 31 brownware sherds (one rim and 30 body sherds). The locus also contained one fragment of fire affected sandstone. The ceramic constituent of those artifacts found outside the locus include 94 sherds: 83 buffware sherds (21 rim and 62 body sherds), and 11 brownware sherds (four rim and seven body sherds).

Locus 1 is located 177 meters southeast of the site datum and measures 22.5 meters north to south by 15.5 meters east to west. The artifacts observed within Locus 1 consist of 64 artifacts including 25 green metavolcanic flakes (one primary, nine secondary, six tertiary, nine pieces of shatter), and two tested cobbles. The black metavolcanic material includes 27 flakes (four primary, 12 secondary, seven tertiary, three shatter), one tested cobble, and two cores. The cryptocrystalline flakes include two secondary, one tertiary, one edge modified tertiary flake. There is only one primary basalt flake located within Locus 1. The main prehistoric component within Locus 1 consists of Colorado buffware ceramics (17 rim sherds and 159 body sherds). The ceramic component also includes brownware (one rim sherd, 30 body sherds).

Due to the high density within Locus 1 a five by five meter sample unit (SSU 1) was recorded within the locus. This sample unit was centrally placed to determine a more accurate interpretation of the surface area to artifact density ratio. The artifacts observed within the sample unit include: 17 black metavolcanic flakes (one primary, eight secondary, one tertiary, and seven shatter pieces). In addition to 14 green metavolcanic flakes (one primary, four secondary, four tertiary, five shatter), and one tested cobble. The sample unit also contained two quartzite primary flakes, one primary basalt flake, two cryptocrystalline silicate secondary flakes, and one edge modified tertiary flake of the same material. Just as within the rest of Locus 1, the main component of the sample unit is Colorado buffware with 94 sherds (eight rim and 86 body sherds), in addition to seven body sherds of brownware. Therefore the density of the sample unit can be accurately interpreted as 5.5 artifacts per square meter.

Those artifacts observed within 30 meters and outside of Locus 1 consist of 14 black metavolcanic flakes (three primary, four secondary, two tertiary, five utilized flakes), two multidirectional cores and two unidirectional cores of the same material. There are 18 green metavolcanic flakes (four primary, nine secondary, five tertiary), with two cores (one unidirectional and one multidirectional), and one tested cobble of the same material type; there are two quartz unidirectional cores, one tested cobble and one primary flake of quartz; as well as one basalt multidirectional core, tested cobble and tertiary flake; one cryptocrystalline silicate multidirectional core is located outside the locus as well. The ceramic constituent of those artifacts found outside the locus include 94 sherds; 83 buffware sherds (21 rim and 62 body sherds). In addition there are 11 brownware sherds (four rim and seven body sherds). The further character of the artifacts associated within RAN-412C is unreported at this time.

The more particular physical context for RAN-412C, extrapolating information from Data Response 112 Figure 4 (URS 2009), to the location of the site, appears to be within both the lower lake basin and the beach zone which are both geomorphic sub-landforms to the lake basin geomorphic landform indicating a Late Pleistocene/Early Holocene period of formation. The lake basin geomorphic landform consists of two distinct components: the lower lake basin and the beach zone or interface between the lake basin and the fan apron. The surface of the lower lake basin is generally very flat to very gently sloping, with a thin mantle of latest Holocene alluvium and aeolian silts overlaying silts and clays. Because older surfaces have been overlain with a thin layer of more recent materials that were deposited after human occupation began in the area, there is a moderate to high likelihood for subsurface deposition within the lower-lying lake basin portion. The particular placement of this site is in an area of ephemeral drainages to the west and a wash to the east, with what appears to be relatively recent alluvial flow from the south, thereby increasing the chance that further archaeological deposits might be shallowly buried at the site. Because episodes of filling and emptying of Lake Cahuilla that have occurred at various times in prehistory would have moved and disturbed soils at or near the surface of the lake basin landform, archaeological features preserved there will likely be disturbed or fragmentary. Still, the presence of recent wash means that archaeological deposits could have been buried before the last maximal filling of the lake, in which case subsurface archaeological deposits could have been preserved.

Based upon the artifact assemblage visible on the surface, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as a multi-use site, where multiple resource procurement and processing activities took place.

RAN-412C has a relatively large assemblage of ceramic sherds, which place this site within Late Prehistoric era. Data from analysis of style elements and physical characteristics of ceramics can provide data pertinent to research questions regarding prehistoric ceramic production technologies and perhaps identify the ethnic origin of the pots they came from. Such data is valuable when placed in context with studies of ceramics distribution associated with prehistoric Lake Cahuilla. Currently, the primary ethnic groups known to have occupied region surrounding RAN-412C include the Diegueño and Tipai (Kamia). Other groups known to have used/traveled/inhabited the area include the Cocopa, Kumeyaay, Ipai, Quechan, Paipai and Cahuilla (Luomala 1978; Schaefer and Laylander 2007; URS 2009). In approximately AD 1200, the course of the Colorado River changed, refilling Lake Cahuilla and providing a stable water source that drew people from surrounding regions to repopulate the Colorado Desert. Ceramic wares which were introduced centuries before in other areas were brought into this region at that time (URS 2009). However, it has been argued that stable populations around the lake developed their own distinctive pottery formulas that became regional expressions of their families and locales (May ND). Although these groups each had specific approaches to the creation of ceramics, ceramic vessels were also traded along with subsistence resources and other items, infusing some uncertainty into the use of data from ceramics to associate one particular area with a particular tribal group or family (May ND). Therefore, it is unlikely that surface data could directly relate RAN-412C, or the area surrounding it to a particular tribe/group.

Data gathered on ceramics in the area surrounding RAN-412C show evidence of a variety of ceramic types and techniques. Though paddle-and-anvil construction techniques were common among groups using this area, the tempers employed, vessel types manufactured, and decoration did vary between groups. The Diegueño used ground clay and did not add temper when manufacturing ceramics. They created a variety of vessels including ollas; bowls, cooking pots, and pipes (Rogers 1973:18; URS 2009). The Kamia sometimes added rose quartz as temper and produced the greatest variety of ceramics among the Yuman bands, including ollas, jars, canteens, bowls, rattles, plates, scoops, cups, and parchers. Kamia ceramics were painted after firing with red and/or black designs (Gifford 1931; Rogers 1973; URS 2009; Van Camp 1979:57). The Cocopah used ground and winnowed clay tempered with ground sherds to create a variety of vessels used for storage and cooking (Alvarez de Williams 1983:99; URS 2009). Quechan vessel types include bowls, parchers, cooking pots, small figurines, and large storage vessels that were used to float goods across rivers (Bee 1983:10; McGuire 1982; URS 2009).

The process of deriving all possible data from ceramics requires the expertise of a specialist in the ceramics of the Lake Cahuilla region. Therefore, it is recommended that a study of the ceramic assemblage at RAN-412C be conducted by such a specialist prior to making a determination of eligibility of RAN-412C.

Archaeologists for the applicant interpret the lithic component of this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists of primary, secondary, and tertiary flakes, and cores. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone materials (black metavolcanic, green metavolcanic, and cryptocrystalline silicate) that are constituents of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes. The presence of flaked stone tools such as the edge modified flake found within RAN-412C could represent resource procurement and/or processing of faunal or floral resources. The creation of flaked stone tools requires additional lithic technologies, possible including bifacial thinning and pressure flaking to shape and refine cutting edges. Utilized flakes found within RAN-412C show evidence of edge wear consistent with their use as an expedient cutting and/or scraping tool.

The presence of a single piece of fire-affected rock would have likely have disarticulated from a hearth and therefore would be evidence of resource processing and/or other activities. Hearth features found in association with lithic debitage could be evidence of more complex lithic resource processing activities. Lithic materials intended for flaked tool production were sometimes heat treated using open hearths in order to improve the flaking characteristics of the stone. Additionally, open hearths were used in prehistory for various other purposes such as parching seeds and grains, cooking, and to provide personal warmth. Such features may also represent sacred/ritualistic activities associated with cremating the deceased and/or animals.

Two fragments of bone were present, which are identified as coming from a large land mammal. Their relatively good state of preservation and no evidence of burning makes it likely that they are not prehistoric in age.

It also must not be disregarded that the higher concentration of artifacts were observed along the wash that bounds the site to the east. This wash runs directly through the shoreline landform to the south of the site, which would support the hypothesis that at least some of these artifacts are eroding down from the beach zone landform, where these types of artifacts are being observed more often and in higher concentrations, into the lake basin and RAN-412C. Despite this, the fairly dense concentration of artifacts at Locus 1 would seem to indicate that taphonomic processes have not disturbed the site to a degree, that would preclude the existence of intact subsurface archaeological deposits.

Based on current data, this site contains artifacts with unique or temporally diagnostic characteristics, the material remains that potentially could be associated with a specific portion of prehistory. At this time, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. RAN-412C is situated atop a very flat to very gently sloping thin mantle of latest Holocene alluvium and eolian silts overlaying silts and clays, which may be a combination of Colorado River supplied lake sediments, and fines flushed into the lake by streams/washes that once terminated near the shoreline. Because this landform was formed during a period of prehistoric human presence, there is a moderate to high likelihood for subsurface deposition within the lower-lying lake basin portion. However, the episodes of filling and emptying of Lake Cahuilla that have occurred at various times in prehistory likely moved and disturbed soils at or near the surface of the lake basin landform, therefore, archaeological features preserved in this area tend to be disturbed and/or fragmentary. Despite this, the potential for subsurface archaeological deposits at RAN-412C still remains; therefore, it is recommended that additional limited subsurface testing and artifact analysis be conducted in order to ascertain whether such deposits are present in the site before the final determination of eligibility can be made.

At this time, without additional data, it is unclear whether or not this site, as a standalone or individual resource, has the potential to yield important additional information about the past. More information, specifically limited subsurface testing and artifact analysis, is necessary before a final determination of eligibility can be made. In addition, RAN-412C is unknown until further data is obtained if this site should be recommended as a contributor to an existing and/or proposed archaeological district or landscape.

CA-IMP-8745 (RAN-412F)

This site was originally recorded as a "temporary camp/lithic reduction area with two loci of chipping circles" by K. Palmer and B. Skinner in 1981. Results of the 2007 Gallegos and Associates survey reported a small portion of this site within their study area and identified three lithic artifacts within the area surveyed. In 2009, URS archaeologists surveyed this site for the IVS Project Transmission Line corridor (300 foot). Results of the URS survey identified that this site extends beyond the Solar Two Transmission line corridor. This data is provided below in the update to CA-IMP-8745.

The following information is an update and expansion of CA-IMP-8745. Site CA-IMP--8745 is an amorphous-shaped prehistoric site that covers a total surface of 13,395 square meters. The site is situated atop an open, relatively flat plateau within the lower lake basin which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating a Late Pleistocene/Early Holocene period of formation (URS 2009). Observed profiles in this area indicate that the soils are made up of thick deposits of gray fine sand and silt that may be a combination of Colorado River supplied lake sediments and fines, flushed into the lake by streams and washes, that once terminated nearby at the shoreline. Vegetation species on the site includes creosote, mesquite, and bunchgrass.

This lithic and ceramic scatter site measures 220 meters east to west by 140 meters north to south, and contains a total of 133 prehistoric artifacts. It consists of one concentration of 41 ceramic sherds interpreted to form a single vessel and an additional 92 artifacts observed outside the locus, which are interpreted to be multiple use activity. The prevailing cultural constituents within this site consist of prehistoric lithic reduction debitage and ceramic artifacts. Artifact density at CA-IMP-8745 is low, with a calculated distribution of one artifact per 102.25 square meters. The overall condition of the site is good.

This site contains one ceramic scatter locus and a total of 133 artifacts (41 associated with Locus 1), which include: 42 metavolcanic flakes (21 primary, 12 secondary and nine tertiary), five quartz flakes (one primary and four secondary), one quartzite secondary flake, one basalt secondary flake, two cryptocrystalline silicate jasper flakes (one secondary and one tertiary), five metavolcanic tested cobbles, one quartz tested cobble, one metavolcanic edge modified flake, two metavolcanic multi-directional cores, one basalt multi-directional core, three metavolcanic bifacial core tools, one metavolcanic unifacial and bifacial core tool, one sandstone metate, one quartzite hammerstone, one basalt hammerstone, one granitic bifacial mano, 63 ceramic sherds (51 buffware, eight brownware, four Tumco buff), and one brownware rim sherd. The area outside of the locus contains a sparse distribution of individual artifacts.

Locus 1 is located on the southern boundary of the site and measures five meters east to west by three meters north to south. Artifacts observed within the locus include 41 buffware body sherds.

Those artifacts observed within 30 meters and outside of the locus consist of: 42 metavolcanic flakes (21 primary, 12 secondary and nine tertiary), five quartz flakes (one primary and four secondary), one quartzite secondary flake, one basalt secondary flake, two cryptocrystalline silicate jasper flakes (one secondary and one tertiary), five metavolcanic tested cobbles, one quartz tested cobble, one metavolcanic edge modified flake, two metavolcanic multi-directional cores, one basalt multi-directional core, three metavolcanic bifacial core tools, one metavolcanic unifacial and bifacial core tool, one sandstone metate, one quartzite hammerstone, one basalt hammerstone, one granitic bifacial mano, 22 ceramic sherds (10 buffware, eight brownware, four Tumco buff), and one brownware rim sherd. The further character of artifacts associated within CA-IMP-8745 is unreported.

The more particular physical context for CA-IMP-8745, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be situated on an open, relatively flat lake basin plateau with distal alluvial fan/aeolian sediments of loose sands, in the form of mesquite covered hummocks and consolidated silts and clays, within the lower lake basin which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating a Late Pleistocene/Early Holocene period of formation. The lake basin geomorphic landform consists of two distinct components: the lower lake basin and the beach zone, or interface between the lake basin and the fan apron. The surface of the lower lake basin is generally very flat to very gently sloping, with a thin mantle of latest Holocene alluvium and eolian silts overlaying silts and clays. Because older surfaces have been overlain with a thin layer of more recent materials that were deposited after human occupation began in the area, there is a moderate to high likelihood for subsurface deposition within the lower-lying lake basin portion. Because episodes of filling and emptying of Lake Cahuilla that have occurred at various times in prehistory would have moved and disturbed soils at or near the surface of the lake basin landform, archaeological features preserved there will likely be disturbed or fragmentary. Soils within the lower lake basin are made up of thick deposits of gray fine sand and silt that may be a combination of Colorado River supplied lake sediments and fines flushed into the lake by streams and washes that once terminated nearby at the shoreline.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret sites such as CA-IMP-8745 with richer assemblages containing ceramics, in association with artifacts such as groundstone and lithic tools to represent subsistence procurement and processing activities.

Archaeologists for the applicant interpret the lithic component of this site as representing expedient tool technology (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this site are of three primary stone materials (metavolcanic, basalt, and quartz) that is a constituent of the surrounding area, and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least three single reduction localities or episodes. It should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Two artifacts identified at CA-IMP-8745, one fragmentary sandstone basin metate and one granite bifacial mano, are groundstone tools. Ground stone tools were made by grinding, abrading, pecking, pounding, and polishing rather than chipping and flaking. Ground stone tools found in the area surrounding CA-IMP-8745 include manos, metates (sometimes referred to as milling stones) and pestles. Metates in this area are typically flattish slabs, manos were smaller, soap and loaf-shaped stones that were moved in a circular motion against the metate, in order to grind small seeds and other food resources; pestles were elongated, club-shaped stones used for pounding and grinding in a mortar. Both manos, metates, and pestles were primarily constructed from coarse-grained stone such as sandstone or granite. Mortars in desert environments absent of large coarse bedrock outcrops were made from cottonwood. The manos and metates present at this site indicate subsistence procurement and/or processing activities (Chartkoff and Chartkoff 1984).

Also found at CA-IMP-8745 are 64 ceramic sherds (48.1 % of the assemblage). Their types include 51 buffware, nine brownware, and four Tumco buff. Characteristics of ceramics such as these may have the potential to provide data concerning ceramic production technologies, the ethnic origin of the vessels from which they came, and the time frame during which they were made. Currently, the primary ethnic groups known to have occupied region surrounding CA-IMP-8745 include the Diegueño and Kamia. Other groups known to have used/traveled/inhabited the area include the Tipai, Cocopa, Kumeyaay, Ipai, Quechan, Paipai and Cahuilla (Luomala 1978; Schaefer and Laylander 2007; URS 2009). In approximately AD 1200, the course of the Colorado River changed, refilling Lake Cahuilla and providing a stable water source that drew people from surrounding regions to repopulate the Colorado Desert. Ceramic wares which were introduced centuries before in other areas were brought into this region at that time (URS 2009). However, it has been argued that stable populations around the lake developed their own distinctive pottery formulas, that became regional expressions of their families and locales (May ND). Although these groups each had specific approaches to the creation of ceramics, ceramic vessels were also traded along with subsistence resources and other items, infusing some uncertainty into the use of data from ceramics to associate one particular area with a particular tribal group or family (May ND). Therefore, it is unlikely that surface data could directly relate CA-IMP-8745 or the area surrounding it, to a particular tribe.

Data gathered on ceramics in the area surrounding CA-IMP-8745 show evidence of a variety of ceramic types and techniques. Though paddle-and-anvil construction techniques were common among groups using this area, the tempers employed, vessel types manufactured, and decoration did vary between groups. The Diegueño used ground clay and did not add temper when manufacturing ceramics. They created a variety of vessels including ollas; bowls, cooking pots, and pipes (Rogers 1973:18; URS 2009). The Kamia sometimes added rose quartz as temper and produced the greatest variety of ceramics among the Yuman bands, including ollas, jars, canteens, bowls, rattles, plates, scoops, cups, and parchers. Kamia ceramics were painted after firing with red and/or black designs (Gifford 1931; Rogers 1973; URS 2009; Van Camp 1979:57). The Cocopah used ground and winnowed clay tempered with ground sherds to create a variety of vessels used for storage and cooking (Alvarez de Williams 1983:99; URS 2009). Quechan vessel types include bowls, parchers, cooking pots, small figurines, and large storage vessels that were used to float goods across rivers (Bee 1983:10; McGuire 1982; URS 2009). In order to derive all possible data from ceramic artifacts present at CA-IMP-8745, it is recommended that they be further analyzed by a ceramics specialist to provide further data such as type of vessel and ware, possible origin, and more specific temporal information before a determination of eligibility can be made.

Further analysis of the geographic location of this site reveals that it is located within close proximity to the high water line of the maximal potential filling of prehistoric Lake Cahuilla. Four events of maximal filling of Lake Cahuilla have occurred between AD 700 and AD 1540. An additional partial filling has been proposed to have occurred sometime between AD 1516 and 1659 (Cleland et al. 2000). Based on the precise alignment of the eastern edge of CA-IMP-8745 with the proposed high water mark of Lake Cahuilla, it is likely that the site existed during or before the most recent complete filling episode, which began around AD 1430 and was fully receded by AD 1540.

Based on current data, this site contains artifacts with unique or temporally diagnostic characteristics, the material remains that potentially could be associated with a specific portion of prehistory. At this time, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. CA-IMP-8745 is situated atop a very flat to very gently sloping thin mantle of latest Holocene alluvium and eolian silts overlaying silts and clays, which may be a combination of Colorado River supplied lake sediments, and fines flushed into the lake by streams/washes that once terminated near the shoreline. Because this landform was formed during a period of prehistoric human presence, there is a moderate to high likelihood for subsurface deposition within the lower-lying lake basin portion. However, the episodes of filling and emptying of Lake Cahuilla that have occurred at various times in prehistory likely moved and disturbed soils at or near the surface of the lake basin landform, therefore, archaeological features preserved in this area tend to be disturbed and/or fragmentary. Despite this, the potential for subsurface archaeological deposits at CA-IMP-8745 still remains; therefore, it is recommended that additional limited subsurface testing and artifact analysis be conducted in order to ascertain whether such deposits are present in the eastern and southern margins of the site before the final determination of eligibility can be made.

At this time, without additional data, it is unclear whether or not this site, as a standalone or individual resource, has the potential to yield important additional information about the past. More information, specifically limited subsurface testing and artifact analysis, is necessary before a final determination of eligibility can be made. In addition, CA-IMP-8745 is unknown until further data is obtained if this site should be recommended as a contributor to an existing and/or proposed archaeological district or landscape.

CA-IMP-4345 (RAN-419)

RAN-419 is an update to a previously recorded archaeological isolate CA-IMP-4345. CA-IMP-4345 was previously recorded by R.H. Norwood in December of 1980 and described as a single ceramic sherd. No further detail was given in Norwood's site record.

RAN-419 is an amorphous-shaped lithic scatter that covers a total surface area of 1,323 square meters. The site is situated atop surfaces ranging from consolidated silts and clays to loose sands and more recent alluvial and eolian sediments within the lower lake basin which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating a Late Pleistocene/Early Holocene period of formation (URS 2009). Observed profiles in this area indicate that the soils are made up of thick deposits of gray fine sand and silt that may be a combination of Colorado River supplied lake sediments and fines flushed into the lake by streams and washes that once terminated nearby at the shoreline. Vegetation species on the site include creosote, burroweed and mesquite.

This lithic scatter and fire affected rock/hearth feature site measures 87 meters northeast to southwest by 42 meters northwest to southeast and contains a total of 50 prehistoric artifacts. It consists of one concentration with 31 artifacts interpreted to be a lithic scatter locus and one cluster of fire affected rocks interpreted to be a hearth feature, plus 19 additional artifacts observed outside the locus and hearth feature. The prevailing cultural constituents within this site consist of prehistoric artifacts. Artifact density at

RAN-419 is low, with a calculated distribution of one artifact per 26.5 square meters. The overall condition of the site is fair with minor alterations due to three ephemeral gullies which run through the west, south and northeast portions of the site.

The artifact types and materials represented at the site include: 27 quartz flakes (15 primary, five secondary, five tertiary and two shatter), eight metavolcanic flakes (five primary, two secondary, and one tertiary), two quartzite primary flakes, two metavolcanic tested cobbles, one quartzite cobble, seven cores (six metavolcanic, one quartzite), one metavolcanic bi-directional core tool, and two basalt hammerstones.

Feature 1 is located at the western edge of the site. Feature 1 measures 77 centimeters north to south by 55 centimeters east to west and consists of a cluster of 10 fire-affected sandstone and metavolcanic cobbles, all with approximately 40-50% of their surfaces covered with caliche.

Locus 1 is located at the eastern edge of the site and measures two meters east to west by two meters north to south. Artifacts observed within Locus 1 include: 27 quartz flakes (15 primary, five secondary, five tertiary, and two shatter), one metavolcanic primary flake, one quartz multi-directional core, one metavolcanic bi-directional core tool and one basalt hammerstone.

Those artifacts observed outside the locus consist of seven metavolcanic flakes (four primary, two secondary, one tertiary), two quartzite primary flakes, two metavolcanic tested cobbles, one quartzite cobble, six multi-directional cores and one basalt hammerstone. The further character of artifacts associated with RAN-419 is unreported.

The more particular physical context for RAN-419, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be within the lower lake basin which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating a Late Pleistocene/Early Holocene period of formation. The lake basin geomorphic landform consists of two distinct components: the lower lake basin and the beach zone or interface between the lake basin and the fan apron. The surface of the lower lake basin is generally very flat to very gently sloping, with a thin mantle of latest Holocene alluvium and eolian silts overlaying silts and clays. Because older surfaces have been overlain with a thin layer of more recent materials that were deposited after human occupation began in the area, there is a moderate to high likelihood for subsurface deposition within the lower-lying lake basin portion. Because episodes of filling and emptying of Lake Cahuilla that have occurred at various times in prehistory would have moved and disturbed soils at or near the surface of the lake basin landform, archaeological features preserved there will likely be disturbed or fragmentary. Soils within the lower lake basin are made up of thick deposits of gray fine sand and silt that may be a combination of Colorado River supplied lake sediments and fines flushed into the lake by stream/wash that once terminated nearby at the shoreline

Based upon the cultural constituent, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, consisting mostly of primary, secondary, and tertiary flakes, angular shatter, multi-directional cores, a bi-directional core tool, tested cobbles, and hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone materials (metavolcanic and quartz) that are constituents of the surrounding area and exhibit expedient methods of percussive lithic reduction processes, the site appears to represent a single reduction locality or episode, but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

Flaked stone tools such as the single core tool present at RAN-419 represent resource procurement and/or processing of faunal or floral resources. The creation of flaked stone tools requires additional lithic technologies, possible including bifacial thinning and pressure flaking to shape and refine cutting edges. However, the particular core tool found at this site shows little evidence of additional modification to improve its efficiency therefore it is likely an expediently produced tool.

Archaeologists for the applicant interpret that the presence of a hearth feature or fire-affected rock is evidence of resource processing and/or other activities. Hearth features found in association with lithic debitage could be evidence of more complex lithic resource processing methods. Lithic materials intended for flaked tool production were sometimes heat treated using open hearths in order to improve the flaking characteristics of the stone. Additionally, open hearths were used in prehistory for various other purposes such as parching seeds and grains, cooking as well as to provide personal warmth. Such features may also represent sacred/ritualistic activities associated with cremating the deceased and/or animals. However, no calcined bone of any kind was observed associated with this feature. The conspicuous absence of any evidence of carbon residue and the paucity of artifacts would support the hypothesis that RAN-419 is a surface phenomenon that resulted from a single episode of use.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction, and analysis of artifact distribution has been accounted for during the recordation process. RAN-419 is situated atop a very flat to very gently sloping thin mantle of latest Holocene alluvium and eolian silts overlaying silts and clays, which may be a combination of Colorado River supplied lake sediments, and fines flushed into the lake by streams/washes that once terminated near the shoreline. Because this landform was formed during a period of prehistoric human presence, there is a moderate to high likelihood for subsurface deposition within the lower-lying lake basin portion. However, the episodes of filling and emptying of Lake Cahuilla that have occurred at various times in prehistory and have moved and/or disturbed soils at or near the surface of the lake basin landform, therefore archaeological features preserved here are likely to be disturbed and/or fragmentary.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, RAN-419 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

RAN-424

Site CA-IMP-4348 is an amorphous-shaped prehistoric site that covers a total surface of 153,700 square meters. The portion of the site being discussed covers approximately 44,779 square meters. The site is situated atop a very old fan surface within the fan piedmont geomorphic landform, which indicates a Pleistocene (or older) period of formation (URS 2009). The surface area of this portion of the site consists of a very old fan surface covered by intact desert pavement that is poorly to moderately developed with small to large, sub-rounded to sub-angular, metavolcanic, basalt, quartz, quartzite, sandstone and granitic gravels and cobbles. Also visible are sandstone outcrops. Soils contain alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles. The northern and southern edges of the site, outside of the Project corridor, are situated within an active wash surface within the fan piedmont geomorphic landform. In addition, along the east southeastern boundary, the site is situated atop fan piedmont/beach interface with undulating beach flats, sandstone outcrops and berms and deflated beach sands within the beach zone which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating Late Pleistocene/Early Holocene period of formation (URS 2009). The soils along the east southeastern boundary consist of beach sands that are non-cohesive and vary from coarse sub-angular to rounded sand and small gravels to medium and coarse well rounded sands overlaid by fine silts and clays. The beach zone interface is determined by the beach sand berm located along the entire east southeastern boundary of the site. In the lower areas of the site, soils are light tan sand with gravels and cobbles. Vegetation species on the site include creosote, burrow bush, bunch grass and mesquite.

This is a prehistoric lithic/ceramic scatter, fire altered rock (FAR)/hearth feature, groundstone, and flaked stone tool site. The site measures 601 meters northeast to southwest by 538 northwest to southeast, while the sample of the site, located within the transmission corridor and a partial area south of the Project area, measures 475 meters northwest to southeast by 139 meters northeast to southwest, and contains at minimum of 2012 prehistoric artifacts. It consists of 30 concentrations of artifacts interpreted to represent multiple activity loci (such as resource procurement, temporary/semi permanent encampment and/or sacred/ritual use) that account for 1703 artifacts; three rock cluster features interpreted to be disarticulated hearths, and sandstone debitage reduction locus interpreted to be quarrying, reduction and manufacture of the sandstone outcrop material for groundstone milling tools (metates). Approximately 309 artifacts were observed between loci and features, displaying a lower frequency than observed within the concentrations. The prevailing cultural constituents within this site consist of prehistoric artifacts. Artifact density at CA-IMP-4348 within the transmission corridor and a partial area south of the Project area is low, with a calculated distribution of one artifact per 23 square meters. The overall condition of the site is fair to good.

The site contains 30 reduction loci, three features and a total of approximately 2012 artifacts (1,703 associated with the loci), which include: 1,203 metavolcanic flakes (307 primary, 469 secondary, 389 tertiary and 38 shatter), 95 basalt flakes (26 primary, 44 secondary, 23 tertiary and two shatter), 154 quartz flakes (39 primary, 57 secondary, 49 tertiary and nine shatter), 43 quartzite flakes (17 primary, 14 secondary, 10 tertiary and two shatter), 69 cryptocrystalline silicate chert flakes (22 primary, 35 secondary and 12 tertiary), 30 sandstone flakes (three primary, seven secondary and 20 tertiary), one rhyolite primary flake, one petrified wood primary flake, 57 cores (36 metavolcanic, six basalt, six quartzite, four quartz and five cryptocrystalline silicate chert), 22 hammerstones (nine metavolcanic, nine quartzite, two quartz and two cryptocrystalline silicate chert), 23 core tools (13 metavolcanic, eight basalt, two chalcedony and one quartzite), 13 edge modified flakes (10 metavolcanic, one basalt, one quartz and one cryptocrystalline silicate chert), six groundstone (two quartzite manos, three sandstone metates and one granitic pestle), two bifaces (one metavolcanic and one basalt), 24 tested cobbles (17 metavolcanic, four quartz, one rhyolite and two quartzite), 236 ceramic body sherds (127 brownware and 109 buffware) and 33 ceramic rim fragments (25 brownware and eight buffware).

Features 1 through 3 of site RAN-424 are situated atop moderately stabilized desert pavement and are described below.

Feature 1 is located in the northeastern center of the site within Locus 30 and measures three meters north to south by two meters east to west. The feature is composed of 13 fire altered sub-rounded to sub-angular metavolcanic, basalt, granitic and sandstone cobbles.

Feature 2 is located 76 meters southwest of Feature 1 and measures five meters northwest to southeast by two meters northeast to southwest. The feature is composed of at least 120 fire altered sub-rounded to sub-angular metavolcanic, basalt, granitic, sandstone and quartzite cobbles.

Feature 3 is located 119 meters northwest of Feature 2 within Locus 31 and measures five meters northwest to southeast by two meters northeast to southwest. The feature is composed of at least 200 fire altered sub-rounded to sub-angular metavolcanic, basalt, granitic, sandstone and quartzite cobbles. There are numerous ceramic sherds, groundstone, flaked stone tools and debitage associated with this feature that are accounted for in locus 31 description.

Locus 1 is situated atop a transition between intact moderately developed desert pavement and beach zone beach sand berm. Loci 2 through 8, 12 through 27, 29 and 30 are situated atop intact moderately developed desert pavement. Loci 11 and 12 are situated atop poorly developed desert pavement.

Locus 1 is located at the southeastern corner of the site and measures three meters east to west by eight meters north to south. Artifacts observed within Locus 1 include: 15 metavolcanic flakes (four primary, nine secondary and two tertiary), two cryptocrystalline silicate primary flakes, 10 brown cryptocrystalline silicate chert flakes (two secondary and eight tertiary), seven ceramic body sherds (two buffware and five brownware), two bifacial cores (one metavolcanic and one cryptocrystalline silica), one cryptocrystalline silicate uni-directional core and one cryptocrystalline silicate chert edge modified flake.

Locus 2 is located 104 meters northwest from Locus 1 and measures two meters east to west by two meters north to south. Artifacts observed within Locus 2 include: 26 metavolcanic flakes (seven primary, seven secondary and 12 tertiary), one green metavolcanic uni-directional core, one green metavolcanic unifacial edge modified flake and one quartz hammerstone.

Locus 3 is located 46 meters northwest from Locus 2 and measures three meters north to south by one meter east to west. Artifacts observed within Locus 3 include 14 metavolcanic flakes (one primary, six secondary and seven tertiary) and one bifacial core tool.

Locus 4 is located 21 meters north northwest from Locus 3 and measures three meters east to west by one meter north to south. Artifacts observed within Locus 4 include 34 metavolcanic flakes (five primary, 16 secondary, 10 tertiary and three shatter) and one green metavolcanic uni-directional core.

Locus 5 is located 11 meters northeast from Locus 4 and measures two meters north to south by one meter east to west. Artifacts observed within Locus 5 include 15 metavolcanic flakes (four primary, six secondary, four tertiary and one shatter) and one green metavolcanic multi-directional core.

Locus 6 is located 29 meters west from Locus 5 and measures two meters north to south by one meter east to west. Artifacts observed within Locus 6 include: five cryptocrystalline silica flakes (two primary and three secondary), two metavolcanic flakes (one primary and one secondary), two basalt flakes (one secondary and one tertiary) and one brown cryptocrystalline silica uni-directional core.

Locus 7 is located 77 meters northwest from Locus 6 and measures 13 meters north to south by 11 meters east to west. Artifacts observed within Locus 7 include 18 quartzite flakes (five primary, six secondary and seven tertiary), 91 metavolcanic flakes (25 primary, 24 secondary, 37 tertiary and five shatter), three metavolcanic tested cobbles and one quartzite unifacial core tool (scraper).

Locus 8 is located 63 meters south southwest from Locus 7 and measures 27 meters north to south by 18 meters east to west. Artifacts observed within Locus 8 include: five quartzite flakes (two primary, two tertiary and one shatter), 115 metavolcanic flakes (34 primary, 38 secondary and 43 tertiary), three quartz flakes (one secondary and two tertiary), 15 basalt flakes (three primary, eight secondary and four tertiary), two chalcedony secondary flakes, five cryptocrystalline silicate chert flakes (two primary, two secondary and one tertiary), two metavolcanic unifacial core tools (chopper), one metavolcanic unifacial core tool (scraper), one metavolcanic unifacial and bifacial chopper/scraper, one metavolcanic multi-directional core, one metavolcanic uni-directional core and one metavolcanic unifacial tertiary edge modified flake.

Locus 9 is located 16 meters west northwest from Locus 8 and measures one meter north to south by one meter east to west. Artifacts observed within Locus 9 include: nine metavolcanic flakes (one primary, five secondary and three tertiary), one metavolcanic uni-directional core and one metavolcanic bifacial edge modified flake.

Locus 10 is located eight meters northwest from Locus 9 and measures two meters east to west by two meters north to south. Artifacts observed within Locus 10 include: 54 metavolcanic flakes (eight primary, 12 secondary, 30 tertiary and four shatter), one quartzite primary flake, one green metavolcanic multi-directional core, one green metavolcanic uni-facial core tool and two hammerstones (one quartz and one quartzite).

Locus 11 is located 16 meters north northwest from Locus 10 and measures three meters northeast to southwest by one meter northwest to southeast. Artifacts observed within Locus 11 include 22 metavolcanic flakes (two primary, five secondary and 15 tertiary) and one green metavolcanic bifacial core.

Locus 12 is located 47 meters northwest from Locus 11 and measures three meters east to west by two meters north to south. Artifacts observed within Locus 12 include: 51 metavolcanic flakes (seven primary, 14 secondary, 29 tertiary and one shatter), three quartzite flakes, two quartzite hammerstones and one green metavolcanic multi-directional core.

Locus 13 is located 34 meters northwest from Locus 12 and measures six meters northeast to southwest by two meters northwest to southeast. Artifacts observed within Locus 13 include: 54 metavolcanic flakes (15 primary, 24 secondary, 13 tertiary and two shatter), one green metavolcanic uni-directional core and one green metavolcanic multi-directional core.

Locus 14 is located 24 meters west from Locus 13 and measures four meters east to west by two meters north to south. Artifacts observed within Locus 14 include 28 metavolcanic flakes (seven primary, 11 secondary, eight tertiary and two shatter).

Locus 15 is located 26 meters north northeast from Locus 14 and measures six meters north to south by three meters east to west. Artifacts observed within Locus 15 include 17 metavolcanic flakes (two primary, four secondary and 11 tertiary), one quartz primary flake, three quartzite flakes (two primary and one tertiary), two green metavolcanic multi-directional cores and one green metavolcanic hammerstone.

Locus 16 is located 15 meters north northeast from Locus 15 and measures 16 meters east to west by nine meters north to south. Artifacts observed within Locus 16 include: 81 metavolcanic flakes (15 primary, 24 secondary, 35 tertiary and seven shatter), 51 quartz flakes (11 primary, nine secondary, 24 tertiary and seven shatter), two quartzite flakes (one primary and one secondary), one basalt secondary flake, two bifacial cores (one brown banded cryptocrystalline silicate chert and one white quartz), one green metavolcanic uni-directional core, three green metavolcanic bifacial core tools (choppers/hammerstones), two green metavolcanic unifacial core tools (choppers), two green metavolcanic bifacial core tools (chopper), three hammerstones (two green metavolcanic and one quartzite), eight ceramic body sherds (six brown ware and two buff ware) and two brown ware rim sherds.

Locus 17 is located 60 meters west northwest from Locus 16 and measures five meters north to south by four meters east to west. Artifacts observed within Locus 17 include 43 quartz flakes (10 primary, 24 secondary and nine tertiary) and one quartz uni-directional core.

Locus 18 is located 49 meters south southwest from Locus 17 and measures three meters north to south by three meters east to west. Artifacts observed within Locus 18 include 19 brownware body sherds and five decorated (incised) brown ware rim sherds.

Locus 19 is located 304 meters east southeast from Locus 18 and measures five meters north to south by three meters east to west. Artifacts observed within Locus 19 include: 24 metavolcanic flakes (three primary, 10 secondary and 11 tertiary), four basalt tertiary flakes, one cryptocrystalline silicate chert bifacial core and one chalcedony bifacial chopper.

Locus 20 is located 101 meters west northwest from Locus 19 and measures seven meters north to south by three meters east to west. Artifacts observed within Locus 20 include: 37 metavolcanic flakes (four primary, 19 secondary and 14 tertiary), one cryptocrystalline silicate chert secondary flake, three basalt flakes (two primary and one secondary), one metavolcanic tested cobble, one green metavolcanic bifacial core and one gray basalt multi-directional core.

Locus 21 is located 26 meters southeast from Locus 20 and measures one meter north to south by two meters east to west. Artifacts observed within Locus 21 include: nine quartz flakes (two primary, six secondary and one tertiary), one chalcedony secondary flake and one quartz uni-directional core.

Locus 22 is located 80 meters west northwest from Locus 21 and measures three meters north to south by two meters east to west. Artifacts observed within Locus 22 include: 11 metavolcanic flakes (three primary, seven secondary and one shatter), three basalt primary flakes, two uni-directional cores (one metavolcanic and one basalt) and one basalt bifacial and unifacial core tool.

Locus 23 is located 35 meters north from Locus 22 and measures four meters east to west by two meters north to south. Artifacts observed within Locus 23 include 58 metavolcanic flakes (11 primary, 11 secondary and 36 tertiary) and one green metavolcanic uni-directional core.

Locus 24 is located 30 meters east northeast from Locus 23 and measures nine meters east to west by two meters north to south. Artifacts observed within Locus 24 include: 35 basalt flakes (eight primary, 12 secondary, 13 tertiary and two shatter), two quartz primary flakes and two basalt multi-directional cores.

Locus 25 is located 160 meters west northwest from Locus 24 and measures two meters north to south by two meters east to west. Artifacts observed within Locus 25 include 18 quartz flakes (six primary, two secondary and 10 tertiary).

Locus 26 is located 24 meters northwest from Locus 25 and measures four meters east to west by three meters north to south. Artifacts observed within Locus 26 include: six cryptocrystalline silicate chert flakes (three secondary and three tertiary), four metavolcanic flakes (three secondary and one tertiary) and one red cryptocrystalline silicate chert multi-directional core.

Locus 27 is located 101 meters east southeast from Locus 26 and measures five meters north to south by four meters east to west. Artifacts observed within Locus 27 include: seven basalt flakes (one primary, five secondary and one tertiary), 22 metavolcanic flakes (one primary, five secondary and 16 tertiary), one rhyolite tertiary flake, two tested cobbles (one metavolcanic and one rhyolite) and one green metavolcanic bifacial core tool (chopper).

Locus 28 is located 60 meters west southwest from Locus 27, adjacent to a sandstone outcrop, and measures six meters north to south by two meters east to west. Artifacts observed within Locus 28 include: 30 sandstone flakes (three primary, seven secondary and 20 tertiary), one basalt unifacial core tool (chopper) and two green metavolcanic hammerstones.

Locus 29 is located 325 meters east southeast from Locus 28 and measures 18 meters east to west by 16 meters north to south. Artifacts observed within Locus 29 include 152 metavolcanic flakes (47 primary, 88 secondary, 10 tertiary and seven shatter), three cryptocrystalline silica flakes (one primary and two secondary), one brown cryptocrystalline silicate chert primary flake, four quartz flakes (one primary and three secondary), four quartzite flakes (three secondary and one shatter), eight fire-affected rocks, one green metavolcanic multi-directional core, one granitic pestle fragment, one green metavolcanic bifacial edge modified flake, two dark green metavolcanic uni-directional cores, one green metavolcanic unifacial secondary edge modified flake, one gray basalt uni-facial edge modified core tool, one dark green metavolcanic bifacial primary edge modified flake, one quartzite uni-directional core, 135 ceramic body sherds (67 buff ware and 68 brown ware), one buff ware rim sherd and 12 brown ware rim sherds.

Locus 30 is located 168 meters west from Locus 29 and measures 42 meters north to south by 28 meters east to west. Artifacts observed within Locus 30 include: two green metavolcanic multi-directional cores, two bifacial cores (one quartzite and one green metavolcanic), one quartzite uni-directional core, one quartzite multi-directional core, six hammerstones (four quartzite and two brown cryptocrystalline silica), two green metavolcanic unifacial core tools (chopper), one basalt bifacial core tool chopper, one basalt biface, two sandstone metate fragment, two unifacial edge modified flake (one quartz and one gray basalt) and six ceramic rim sherds (three brown ware, two buffware and one buffware with drilled hole). Due to high density of this locus, two 2-meter north to south by 2 meter east to west sample units were established to determine density of the locus. Sample Unit 1 with a high artifact density of one artifact per 0.06 square meters is located in the central portion of the locus where observed surface density appears to be highest, and includes 42 metavolcanic flakes (12 primary, 14 secondary, 11 tertiary, five shatter), seven cryptocrystalline silica flakes (one primary and six secondary), six quartz flakes (two secondary, two tertiary and two shatter), one quartzite secondary flake, one petrified wood primary flake, seven ceramic body sherds (four brown ware, three buff ware), two green metavolcanic cores, one quartzite bifacial mano, two brown ware rim sherds and three metavolcanic tested cobbles. Sample Unit 2 with a high artifact density of one artifact per 0.045 square meters is located six meters south-southwest from Sample Unit 1 and placed where artifact surface densities appeared to be highest, and includes 71 metavolcanic flakes (18 primary, 29 secondary and 24 tertiary), four quartz flakes (one primary, two secondary and one tertiary), one metavolcanic tested cobble, six buffware body sherds, six green metavolcanic cores (two uni-directional and four multidirectional), one green metavolcanic biface, one sandstone metate fragment and three metavolcanic cores (two uni-directional and one multi-directional).

Those artifacts observed outside of the loci and features consist of 154 metavolcanic flakes (73 primary, 48 secondary and 33 tertiary), 29 cryptocrystalline silica flakes (14 primary, nine secondary and six tertiary), 25 basalt flakes (nine primary, nine secondary and seven tertiary), nine quartz flakes (three primary, four secondary and two tertiary), 11 quartzite (seven primary, three secondary and one tertiary), 14 tested cobbles (12 metavolcanic, one quartz and one quartzite), one basalt multi-directional core, eight uni-directional cores (four metavolcanic, three quartzite and one basalt), three bifacial cores (two metavolcanic and one quartzite), two unifacial core tool (choppers) (one metavolcanic and one basalt), one basalt unifacial core tool, one basalt bifacial core tool (chopper), three hammerstones (two metavolcanic and one quartzite), one granitic bifacial mano, two green metavolcanic unifacial edge modified flakes, two green metavolcanic bifacial edge modified flakes, 43 ceramic body sherds (31 brownware and 12 buffware) and one brown ware recurved rim sherd. The further character of artifacts associated with this site is reported on DPR 523 series forms under a confidential filing.

The more particular physical context for CA-IMP-4348, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be within multiple landforms and subordinate landforms, which include a very old fan surface within the fan piedmont, fan apron, beach zone and interfaces between these landforms. The surface and subsurface aspects of this landform are dominated by erosional fan remnants, erosional sideslopes and gullies, and inset fans, which have been further eroded and re-deposited down slope. The resulting landform is generally made up of contiguous or partially overlapping mantles deposited during the Pleistocene (URS 2009). Despite geologically based claims for Early Pleistocene archaeological deposits within the Yuha basin, these findings remain inconclusive and lack solid chronological confirmation (Schaeffer and Laylander 2007). Therefore, there is no conclusive evidence of human presence within the fan piedmont during or before the Pleistocene. Because the formation of the land surface occurred prior to human presence in the region, there is a very low likelihood that buried archaeological deposits will be present within the fan piedmont.

Along the eastern boundary, the site is situated atop distal fan apron/beach interface within the beach zone which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating Late Pleistocene/Early Holocene period of formation (URS 2009). The lake basin geomorphic landform consists of two distinct components: the lower lake basin and the beach zone or interface between the lake basin and the fan apron. The land surface of the beach zone is undulating and consists of beach flats, sand berms and deflated beach sands that are consistent with the multiple formation and recessional events of the maximum Lake Cahuilla shoreline. Because the advance and recession of the waters of Lake Cahuilla at various times in prehistory would have moved surface soils within the beach zone, the potential for subsurface deposition is heightened. The soils within the beach zone consist of sands that are non-cohesive and vary from coarse sub-angular to rounded sand and small gravels to medium and coarse well rounded sands overlaid by fine silts and clays. The beach zone interface is evidenced in CA-IMP-4348 by a sand berm located along the entire eastern boundary of the site. Additionally, there is a wash along the southwestern margin of the site. In that area the soils are light tan sand with gravels and cobbles.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret that sites such as CA-IMP-4348 with richer assemblages containing ceramics in association with hearth features and artifacts such as groundstone and lithic tools represent subsistence procurement, processing activities, and potentially habitation and/or sacred or ritual activities.

The large numbers of ceramic sherds present at CA-IMP-4348 are of styles that date to the Late Prehistoric. Currently, the primary ethnic groups known to have occupied region surrounding CA-IMP-4348 include the Diegueño and Kamia. Other groups known to have used/traveled/inhabited the area includes the Tipai, Cocopa, Kumeyaay, Ipai, Quechan, Paipai and Cahuilla (Luomala 1978; Schaefer and Laylander 2007, URS 2009). In approximately AD 1200, the course of the Colorado River changed, refilling Lake Cahuilla and providing a stable water source and drawing people from surrounding regions to repopulate the Colorado Desert. Ceramic wares which were introduced centuries before in other areas were brought into this region at that time (URS 2009). However, it has been argued that stable populations around the lake developed their own distinctive pottery formulas that became regional expressions of their families and locales (May ND). Although these groups each had specific approaches to the creation of ceramics, ceramic vessels were also traded along with subsistence resources and other items, infusing some uncertainty into the use of data from ceramics to associate one particular area with a particular tribal group or family. Therefore, it is unlikely that surface data could directly relate CA-IMP-4348 or the area surrounding it to a particular tribe.

Included in the ceramic assemblage are various sherds that might have the potential to provide data relative to research questions regarding use, manufacturing technologies, and distribution of ceramics in the prehistoric Lake Cahuilla region. For example, present at CA-IMP-4348 are 29 ceramic rim fragments (25 brown ware and eight buff ware). Rim styles can provide evidence of the original form of vessels which may provide insight into regional and ethnic origin. The ceramic assemblage also includes five brown ware decorated (incised) rim sherds and several ceramic sherds that showed evidence of scum coat finish, which are characteristics that may also provide stylistic evidence of origin. Two ceramic rim sherds have repair holes that may be evidence of lengthier curation of the vessels from which they once came.

The flaked stone assemblage at CA-IMP-4348 includes bifaces, edge modified flakes and a large quantity and variety of cores, hammerstones and debitage. Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the Applicant interpret most of the loci of this site as expedient tool technology localities (Jones and Klar 2007). The cultural constituents of these loci are lithic reduction in nature. Debitage consists primarily of mostly of primary, secondary, and tertiary flakes, cores, and hammerstones. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Fifteen of the 30 loci (50%) are comprised of one stone material (metavolcanic), which are interpreted as single reduction loci, and an additional 12 loci (40%) can be described as scatters of two to five different materials. Because the majority of lithic materials reduced in this site are constituents of the surrounding area and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent at least 27 reduction localities or episodes. It should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

The presence of flaked stone tools such as bifaces and edge modified flakes within CA-IMP-4348 represents resource procurement and/or processing of faunal or floral resources. The creation of flaked stone tools requires additional lithic technologies, possible including bifacial thinning and pressure flaking to shape and refine cutting edges.

Furthermore, archaeologists for the applicant interpret the presence of hearth features or fire-altered rock such as the three rock cluster features observed at CA-IMP-4348, as evidence of resource processing and/or other activities. Hearth features found in association with lithic debitage could be evidence of more complex lithic resource processing activities. Lithic materials intended for flaked tool production were sometimes heat treated using open hearths in order to improve the flaking characteristics of the stone. Additionally, open hearths were used in prehistory for various other purposes such as parching seeds and grains, cooking, and to provide personal warmth. Such features may also represent sacred/ritualistic activities associated with cremating the deceased and/or animals. Although, no burnt and/or calicined bones of any kind were observed within the areas surveyed the possibility of such being present below the surface cannot be discounted. All three fire features are disarticulated with their construction materials being loosely scattered. Feature 3 is located within and potentially associated with Locus 30, a high density concentration of lithic materials with some ceramic sherds. Features 1 and 2 do not show any evidence of similar associations.

Groundstone tools such as the three sandstone metate fragments, two manos and single granitic pestle fragment located at CA-IMP-4348 were made by grinding, abrading, pecking, pounding, and polishing rather than chipping and flaking. Groundstone tools found in the surrounding region include manos, metates (sometimes referred to as milling stones) and pestles. Metates in this area are typically flat slabs; manos were smaller, soap and loaf-shaped stones that were moved in a circular motion against the metate in order to grind small seeds and other food resources; pestles were elongated, club-shaped stones used for pounding and grinding in a mortar. Manos, metates and pestles were primarily constructed from coarse-grained stone such as sandstone or granite. Mortars in desert environments absent of large coarse bedrock outcrops were made from cottonwood. Manos, metates and pestles are associated with subsistence procurement and/or processing (Chartkoff and Chartkoff 1984). The particular examples of ground stone present at CA-IMP-4348 require additional analysis to determine if unique characteristics of these artifacts may provide additional data regarding prehistory and resource processing behavior for this region.

This site cannot reliably be associated with any distinctive or significant event, person, design, or construction and analysis of artifact distribution has been accounted for during the recordation process. There is a potential for subsurface deposition at this site and in conjunction with the unique and temporally diagnostic artifacts recorded, this site has the potential to provide additional data associated with a specific portion of prehistory. CA--IMP-4348 is primarily situated atop a subordinate landform characterized as an older fan surface with alluvial sands comprised of decomposed metavolcanic and granitic gravels and cobbles within the fan piedmont geomorphic landform. This geomorphic landform indicates a Pleistocene (or older) period of formation and because the formation of this landform predates human presence in the area, there is very low likelihood for subsurface archaeological deposits. The northern and southern edges of the site, located outside the Project corridor, are defined by an active wash within the fan piedmont, and have a slightly greater potential for the presence of subsurface archaeological deposits where recent alluvium has been deposited. The deposits and features found along the east southeastern edge of the site area are located within the beach zone. This landform was formed by the advance and recession of the waters of Lake Cahuilla at various times in prehistory moving surface soils within the beach zone. Therefore, there is a moderate to high potential for subsurface archaeological deposits within the beach zone. Because of that potential for subsurface archaeological deposits at CA-IMP-4348, it is recommended that additional limited subsurface testing and artifact analysis be conducted in order to ascertain whether such deposits are present in the eastern and southern margins of the site before the final determination of eligibility can be made.

Because of the nature of potentially informative and diagnostic characteristics of ceramics found at CA-IMP-4348, the recordation of all potential data that might be derived from them requires the work of a ceramics specialist. It is recommended that the ceramics at CA-IMP-4348 be studied by such a specialist so it can be determined if they do provide any additional data potential and, if so, such data can be recorded.

Further analysis of the geographic location of this site reveals that it is located on the high water line of the maximal potential filling of prehistoric Lake Cahuilla. Four events of maximal filling of Lake Cahuilla have occurred between AD 700 and AD 1540. An additional partial filling has been proposed to have occurred sometime between AD 1516 and 1659 (Cleland et al. 2000). Based on the precise alignment of the eastern edge of CA-IMP-4348 with the proposed high water mark of Lake Cahuilla, it is likely that the site existed during or before the most recent complete filling episode, which began around AD 1430 and was fully receded by AD 1540.

In addition, due to characteristics of the artifact assemblage and features present at CA--IMP-4348, and its proximity to the Lake Cahuilla shoreline, it is considered a contributor to the proposed Lake Cahuilla High Water Mark District.

RAN-426

RAN-426 is an amorphous-shaped lithic scatter that covers a total surface of 3,579 square meters. The site is situated atop an open, relatively flat plateau consisting of recent alluvium within the lower lake basin, which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating a Late Pleistocene/Early Holocene period of formation (URS 2009). Observed profiles in this area indicate that the soils are made up of thick deposits of gray fine sand and silt that may be a combination of Colorado River supplied lake sediments and fines flushed into the lake by streams and washes that once terminated nearby at the shoreline. An active wash cuts through the site. Vegetation species on the site include creosote.

This lithic scatter site measures 159 meters north to south by 80 meters east to west, and contains a total of 33 prehistoric artifacts. It consists of one concentration interpreted to be one lithic scatter locus, with 14 artifacts and 19 additional artifacts observed outside the locus. The prevailing cultural constituents within this site consist of prehistoric artifacts. Artifact density at RAN-426 is low, with a calculated distribution of one artifact per 108.45 square meters. The overall condition of the site is fair with some alterations due to off-highway vehicle use.

The artifact types and materials represented at RAN-426 include: 27 metavolcanic flakes (18 primary, seven secondary and two tertiary), one quartz primary flake, one uni-directional metavolcanic core, one bi-directional metavolcanic core, one metavolcanic tested cobble, one multidirectional cryptocrystalline silicate core and one quartzite edge modified flake.

Locus 1 is located in the south central portion of the site and measures four meters north to south by eight meters east to west. Artifacts observed within Locus 1 include: seven green metavolcanic flakes (six primary and one secondary), six black metavolcanic flakes (five primary and one secondary) and one quartzite unifacial edge modified flake.

Those artifacts observed within 30 meters and outside of Locus 1 consist of: 10 green metavolcanic flakes (five primary, three secondary and two tertiary), four black metavolcanic flakes (two primary and two secondary), one uni-directional metavolcanic core, one bi-directional metavolcanic core, one green tested metavolcanic cobble, one multidirectional green cryptocrystalline silicate core and one quartz primary flake. The further character of artifacts found within RAN-426 is unreported.

The more particular physical context for RAN-426, extrapolating information from Data Response 112, Figure 4 (URS 2009), to the location of the site, appears to be within the lower lake basin, which is a geomorphic sub-landform to the lake basin geomorphic landform, indicating a Late Pleistocene/Early Holocene period of formation. The lake basin geomorphic landform consists of two distinct components: the lower lake basin and the beach zone or interface between the lake basin and the fan apron. The surface of the lower lake basin is generally very flat to very gently sloping, with a thin mantle of latest Holocene alluvium and eolian silts overlaying silts and clays. Because older surfaces have been overlain with a thin layer of more recent materials that were deposited after human occupation began in the area, there is a moderate to high likelihood for subsurface deposition within the lower-lying lake basin portion. Because episodes of filling and emptying of Lake Cahuilla that have occurred at various times in prehistory would have moved and disturbed soils at or near the surface of the lake basin landform, archaeological features preserved there will likely be disturbed or fragmentary. Soils within the lower lake basin are made up of thick deposits of gray fine sand and silt that may be a combination of Colorado River supplied lake sediments and fines flushed into the lake by streams and washes that once terminated nearby at the shoreline.

Based upon the cultural constituents, the physical context, and the results of additional archival research, archaeologists for the applicant interpret this site as an expedient tool technology locality (Jones and Klar 2007). The cultural constituents of this site are lithic reduction in nature, debitage consists primarily of primary flakes and cores. Such artifacts indicate percussion (hard-hammer and/or soft-hammer) reduction (Andrefsky Jr. 2008; Odell 2004; Whittaker 1994). Because the majority of lithic materials reduced in this lithic scatter are of the same primary stone (metavolcanic) material that is a constituent of the surrounding area, and exhibit expedient lithic reduction methods of percussion reduction processes, the site appears to represent one single reduction locality or episode; but it should not be discounted that artifacts within this locality may have been collected and/or used at a later point in time.

The presence of flaked stone tools such as the edge modified flake found within RAN-426, represents resource procurement and/or processing of faunal or floral resources. The creation of flaked stone tools requires additional lithic technologies, possibly including bifacial thinning and pressure flaking to shape and refine cutting edges. However, the particular edge modified flake present at RAN-426 shows only rudimentary modification to improve its efficiency as a cutting or scraping tool.

Because this site lacks artifacts with unique or temporally diagnostic characteristics, the material remains cannot be associated with a meaningful portion of prehistory or history. Additionally, this site cannot reliably be associated with any distinctive or significant event, person, design, or construction; and analysis of artifact distribution has been accounted for during the recordation process. RAN-426 is situated atop a very flat to very gently sloping thin mantle of latest Holocene alluvium and eolian silts overlaying silts and clays, which may be a combination of Colorado River supplied lake sediments, and fines flushed into the lake by streams and washes that once terminated near the shoreline. Because this landform was formed during a period of prehistoric human presence, there is a moderate to high likelihood for subsurface deposition within the lower-lying lake basin portion. However, the episodes of filling and emptying of Lake Cahuilla that have occurred at various times in prehistory would have moved and disturbed soils at or near the surface of the lake basin landform; therefore, archaeological features preserved appear to be disturbed and fragmentary.

As a result, this site, as a stand-alone or individual resource, is recommended not eligible for the National Register and is not a historic property pursuant to the National Register or a historical resource per the California Register under any of the criteria for eligibility. In addition, RAN-426 is not considered a contributor to an existing and/or proposed archaeological district or landscape.

APPENDIX B

DRAFT FINAL PROGRAMMATIC AGREEMENT AMONG THE BUREAU OF LAND MANAGEMENT-CALIFORNIA, THE UNITED STATES ARMY CORPS OF ENGINEERS, THE CALIFORNIA ENERGY COMMISSION, THE TESSERA SOLAR COMPANY, THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION REGARDING THE TESSERA SOLAR - IMPERIAL VALLEY SOLAR PROJECT, IMPERIAL COUNTY, CALIFORNIA.

PROGRAMMATIC AGREEMENT AMONG THE BUREAU OF LAND MANAGEMENT-CALIFORNIA, THE UNITED STATES ARMY CORPS OF ENGINEERS, THE CALIFORNIA ENERGY COMMISSION, THE TESSERA SOLAR COMPANY, THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION REGARDING THE TESSERA SOLAR - IMPERIAL VALLEY SOLAR PROJECT, IMPERIAL COUNTY, CALIFORNIA

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INTRODUCTION

The purpose of this Programmatic Agreement (Agreement) is to provide processes whereby the Bureau of Land Management (BLM), the U.S. Army Corps of Engineers (COE), and the California Energy Commission (Energy Commission), in consultation with the California State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation (ACHP), Indian Tribes and other consulting parties, shall determine the steps the agencies shall follow to take into account effects on historic properties as required by section 106 of the National Historic Preservation Act and satisfy the requirements of the California Environmental Quality Act.

The BLM, the COE, and the Energy Commission, in consultation with the consulting parties to this Agreement, will consider and incorporate within the section 106 consultation process the performance standards (desired future condition), the range of mitigation measures and commitment to mitigate, and monitoring requirements of the Energy Commission's *Staff Assessment* for the Tessera Solar Imperial Valley Solar Project (Application for Certification 08-AFC-5). The BLM and the Energy Commission will endeavor to make the historic properties treatment and management provisions of this Agreement as consistent as possible with the objectives and terms of the *Staff Assessment* within the context of the consultation process required by section 106 of the NHPA.

Government agencies, consulting parties, and the public identified in the scoping and public notification process for Staff Assessment and Environmental Impact Statement will be advised in the Staff Assessment and Final Environmental Impact Statement that historic properties associated with the undertaking would be treated consistent with the mitigation measures or performance standards identified in the Staff Assessment and adopted by the Energy Commission, and consistent with the stipulations of this Agreement. A proposed final draft of this Agreement will be circulated for public comment as an attachment to the Final Staff Assessment and Final Environmental Impact Statement. The Signatories have consulted with the Invited Signatories and Concurring Parties to this Agreement, and have taken into consideration public comments received regarding the draft Agreement in preparing this final Agreement. Additionally, the BLM has made written requests to Indian Tribes to provide comments regarding the proposed final draft Agreement and has consulted with the other Signatories and Invited Signatories to take into consideration the views and comments received from Indian Tribes in developing this Agreement.

PROGRAMMATIC AGREEMENT
AMONG THE
BUREAU OF LAND MANAGEMENT-CALIFORNIA,
THE UNITED STATES ARMY CORPS OF ENGINEERS,
THE CALIFORNIA ENERGY COMMISSION,
THE TESSERA SOLAR COMPANY,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER,
AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE TESSERA SOLAR - IMPERIAL VALLEY SOLAR PROJECT,
IMPERIAL COUNTY, CALIFORNIA

WHEREAS, the Tessera Solar Company (Applicant) has applied for a right of way (ROW) grant on approximately 6,144 acres of public lands managed by the Bureau of Land Management (BLM) and has submitted a Plan of Development (POD) to construct, operate and maintain a solar energy electrical generating plant (hereinafter referred to as the Imperial Valley Solar Project), including construction of approximately 30,000 solar dish power control units (SunCatchers), a 230 kilovolt (kV) transmission lines, a water pipeline, paved arterial roads, unpaved perimeter access and maintenance roads, , laydown and staging areas, and support facilities and infrastructure (Appendix D: Project Description; Appendix E: Project Maps and Illustrations); and

WHEREAS, the BLM has determined that issuing a right-of-way grant (ROW) to the Tessera Solar Company in accordance with the Federal Land Policy and Management Act (FLPMA) (Public Law 940-579; 43 USC 1701) is an undertaking as defined at 36 CFR 800.16(y)(Protection of Historic Properties, August 5, 2004) of the regulations implementing section 106 of the National Historic Preservation Act (16 USC 470(f))(NHPA); and

WHEREAS, Army Corps of Engineers (COE) has determined that the Imperial Valley Solar Project involves jurisdictional waters as defined by section 404 of the Clean Water Act requiring issuance of a COE permit, is an undertaking as defined at 36 CFR 800.16(y), and intends to use this Agreement to comply with section 106 of the NHPA and is a Signatory to this Agreement; and

WHEREAS, the BLM is the lead Federal agency for the undertaking for the purpose of complying with section 106 of the NHPA and its implementing regulations found at 36 CFR Part 800, and the BLM shall be responsible for managing historic properties within the Area of Potential Effects (APE) for the undertaking pursuant to the NHPA; and

WHEREAS, in August 2005, the United States Congress enacted the Energy Policy Act of 2005 (Public Law 109-58). In section 211 of this Act, Congress directed that the Secretary of the Interior (the “Secretary”) should, before the end of the 10-year period beginning on the date of enactment of the Act, seek to have approved non-hydropower renewable energy projects located on the public lands with a generation capacity of at least 10,000 megawatts of electricity; and

WHEREAS, by Secretarial Order No. 3285 issued March 11, 2009, the Secretary stated as policy that encouraging the production, development, and delivery of renewable energy is one of the Department of Interior's (DOI) highest priorities and that agencies and bureaus within the DOI will work collaboratively with each other, and with other Federal agencies, departments, states, local communities, and private landowners to encourage the timely and responsible development of renewable energy and associated transmission while protecting and enhancing the Nation's water, wildlife, and other natural resources; and

WHEREAS, BLM and the COE have consulted with the California State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP), pursuant to 36 CFR 800.14(b)(3) and following the procedures outlined at 36 CFR 800.6, and is in the process of considering alternatives for the undertaking that have the potential to adversely affect historic properties and may reach a decision regarding approval of the undertaking before the effects of the undertaking's implementation on historic properties have been fully determined, the BLM chooses to continue its assessment of the undertaking's potential adverse effect and resolve any such effect through the implementation of this Programmatic Agreement (Agreement); and

WHEREAS, the BLM and COE, in consultation with the SHPO and the ACHP and pursuant to 36 CFR 800.4(b)(2), has determined that a phased (tiered) process for compliance with section 106 of the National Historic Preservation Act (NHPA) may be appropriate for the undertaking; and

WHEREAS, the Juan Bautista de Anza National Historic Trail corridor is located within the APE for this undertaking and the National Park Service (NPS) has agreed to participate in the section 106 consultation regarding the undertaking under the terms of this Agreement and is a Concurring Party to this Agreement; and

WHEREAS, the California Energy Commission (Energy Commission), may certify the Imperial Valley Solar Project located on both public and private lands pursuant to Section 25519, subsection (c) of the Warren-Alquist Act of 1974 and for the purposes of consistency proposes to manage all historical resources in accordance with the stipulations of this Agreement; and

WHEREAS, the BLM, in coordination with the Energy Commission, has authorized the Applicant to conduct specific identification efforts for this undertaking including a review of the existing literature and records, cultural resources surveys, ethnographic studies, and geo-morphological studies to identify historic properties that might be located within the Area of Potential Effect (APE); and

WHEREAS, the Applicant has retained URS Corporation to complete all of the investigations necessary to identify and evaluate cultural resources located within the Area of Potential Effect (APE) for both direct and indirect effects. URS Corporation has completed a review of the existing historic, archaeological and ethnographic literature and records to ascertain the presence of known and recorded cultural resources in the APE and buffered study area, has conducted an intensive field survey for 7,700 acres of land, including all of the lands identified in APE for direct effects for all project alternatives, and has completed intensive field surveys for alternatives on lands that are no longer part of the project. URS Corporation has submitted a cultural resources report (*Revised Class III Confidential Cultural Resources Technical Report, Application for Certification (08-AFC-5), SES Solar Two, LLC*, prepared by URS Corporation, December 2009) that presents the results of identification efforts to the BLM, the COE, and the Energy Commission. BLM has submitted a summary report of the cultural resources investigations to the consulting parties and Indian Tribes for review and comment; and

WHEREAS, the BLM and the Energy Commission have prepared the *Staff Assessment and Draft Environmental Impact Statement and Draft California Desert Conservation Area Plan Amendment, SES Solar Two Project, Application for Certification (08-AFC-5) Imperial County (2010)* to identify the project alternatives for purposes of the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), and have comparatively examined the relative effects of the alternatives on known historic properties; and

WHEREAS, the Applicant, as grantee of the proposed ROW, has participated in consultation per 36 CFR 800.2(c)(4), and shall provide all cultural resources documentation required by the BLM in support of the stipulations to this agreement and is willing to carry out the stipulations of this Agreement under the oversight of BLM, and is an Invited Signatory to this Agreement; and

WHEREAS, pursuant to section 101(d)(6)(B) of the NHPA, 36 CFR 800.2(c)(2)(ii), the American Indian Religious Freedom Act (AIRFA), Executive Order 13175, and section 3(c) of the Native American Graves Protection and Repatriation Act (NAGPRA), the BLM is responsible for government-to-government consultation with Federally recognized Indian Tribes and is the lead agency for all Native American consultation and coordination; and

WHEREAS, the BLM has formally notified and invited the Campo Kumeyaay Nation, the Cocopah Indian Tribe, the Quechan Indian Tribe, the Ewiiaapaayp Band of Kumeyaay Indians, the Jamul Indian Village, the Kwaaymii Laguna Band of Indians, the La Posta Band of Kumeyaay Indians, the Manzanita Band of Kumeyaay Indians, the San Pasqual Band of Diegueno Indians, and the Santa Ysabel Band of Diegueno Indians (Tribes), and the Ah-Mut Pipa Foundation and Kumeyaay Cultural Repatriation Committee (Tribal Organizations) to consult on this undertaking and participate in this Agreement as a Concurring Party. BLM has documented its efforts to consult with the Tribes and Tribal Organizations and a summary is provided in Appendix I to this Agreement; and

WHEREAS, the BLM shall continue to consult with the Tribes and Tribal Organizations throughout the implementation of this Agreement regarding the adverse effects to historic properties to which they attach religious and cultural significance. BLM will carry out its responsibilities to consult with Tribes that request such consultation regardless of their status as a consulting party to this PA. Through consultation, Tribes and Tribal Organizations have expressed their views and concerns about the importance and sensitivity of cultural resources within and near the project area and attach significance to the broader cultural landscape; and

WHEREAS, the National Trust for Historic Preservation, the Anza Society, the California Unions for Reliable Energy, and the Sacred Lands Institute, as organizations, and Edie Harmon and Greg P. Smestad, Ph.D., as individuals, have been invited to consult on this undertaking and this Agreement, have been afforded consulting party status pursuant to 36 CFR 800.4, and have been invited to be Concurring Parties to this Agreement;

NOW, THEREFORE, the BLM, the COE, the SHPO, and the ACHP (hereinafter "Signatories) and the NPS, the Energy Commission, and the Applicant (hereinafter "Invited Signatories"), agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

STIPULATIONS

The BLM and/or the COE shall ensure that the following measures are implemented:

I. DEFINITIONS

The definitions found at 36 CFR 800.16 and in this section apply throughout this agreement except where another definition is offered in this Agreement.

a) ***Concurring Parties***. Concurring Parties may propose amendments to this Agreement. Amendments proposed by Concurring Parties may be considered at the discretion of the Signatories.
b) ***Cultural Resource.*** A cultural resource is an object or definite location of human activity, occupation, or use identifiable through field inventory, historical documentation, or oral evidence. Cultural resources are prehistoric, historic, archaeological, or architectural sites, structures, buildings, places, or objects and definite locations of traditional cultural or religious importance to specified social and/or culture groups. Cultural resources include the entire spectrum of resources, from artifacts to cultural landscapes, without regard to eligibility for inclusion on the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR).
c) ***Consulting parties.*** Collectively refers to the Signatory, Invited Signatory and Concurring Parties to this Agreement.
d) ***Day.*** Singular or plural, refers to a calendar, rather than a business, day.
e) ***Historic Properties.*** Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP maintained by the Secretary of the Interior and per the eligibility criteria at 36 C.F.R. § 60.4. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the NRHP criteria. The term eligible for inclusion in the National Register includes both properties formally determined as such in

accordance with regulations of the Secretary of the Interior and all other properties that meet the NRHP criteria.

f) ***Historical Resources.*** Historical resources includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California and meets the criteria for listing on the California Register as provided at California Code of Regulations Title 14, Chapter 11.5, Section 4850.

g) ***Invited Signatories.*** Invited Signatories to this Agreement are the National Park Service, Energy Commission and Applicant. Invited Signatories have specific responsibilities as defined in this Agreement have the same rights as the Signatory Parties to propose amendments and termination of this Agreement.

h) ***Lands Administered by the U.S. Department of Interior, Bureau of Land Management*** (BLM) means any Federal lands under the administrative authority of the BLM.

i) ***Lands Regulated by the U.S. Army Corps of Engineers*** means any lands subject to regulation by the COE pursuant to section 404 of the Clean Water Act (33 U.S.C. section 1344) or other law, and for which the COE has issued a Department of the Army permit.

j) ***Literature Review.*** A literature review is one component of a BLM class 1 inventory, as defined in BLM Manual Guidance 8100..21(A)(1), and is a professionally prepared study that includes a compilation and analysis of all reasonably available cultural resource data and literature, and a management-focused, interpretive, narrative overview, and synthesis of the data. The overview may also define regional research questions and treatment options.

k) ***Records Search.*** A records search is one component of a BLM class 1 inventory and an important element of a literature review. A records search involves obtaining existing cultural resource data from published and unpublished documents, BLM cultural resource inventory records, institutional site files, State and national registers, interviews, and other information sources.

l) ***Signatories.*** Signatories to this Agreement are the BLM, COE, SHPO, and ACHP. Signatories have the sole authority to execute, amend or terminate this Agreement.

m) ***Traditional Cultural Property.*** A traditional cultural property is defined generally as property that is important to a living group or community because of its association with cultural practices or beliefs that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community. It is a place that may figure in important community traditions or in culturally important activities, such as traditional gathering areas, prayer sites, or sacred/ceremonial locations. These sites may or may not contain features, artifacts, or physical evidence, but are usually identified through consultation. A traditional cultural property may be eligible for inclusion in the National Register.

n) ***Tribes.*** The federally recognized and non-federally recognized Indian Tribes that BLM has invited to consult on this undertaking and participate and concur in this Agreement.

o) ***Undertaking.*** Issuing any ROW/permit(s) individually or collectively by the BLM or COE allowing or facilitating construction, operation or maintenance activities related to the Project on BLM administered or COE regulated lands constitutes an "undertaking" as defined at 36 C.F.R. 800.16(y) and is the undertaking addressed by this Agreement.

p) ***Windshield Survey.*** A windshield survey is a common method utilized in reconnaissance surveys to identify built-environment cultural resources, such as buildings, objects, and structures. Windshield surveys involve surveyors driving or walking streets and roads of a community and observing and recording the buildings, structures, and landscape characteristics they see.

II. AREA OF POTENTIAL EFFECTS

a) Prior to and during construction of the undertaking, the APE shall include all areas in which:

i) Historic properties could sustain direct physical effects as a result of the undertaking and is defined to include:

(1) All areas subject to the BLM's ROW decision for the Phase I 300 MW and the Phase II 450 MW portions of the project area, which includes approximately 6,140 acres of public lands and 360 acres of private lands. The area is generally bounded by Interstate 8 on the south, Dunaway Road to the east, and the Evan Hewes Highway to the north and west. A 200 foot buffer around the APE was required to be included in the survey for cultural resources within the APE.

(2) The APE for linear elements of the undertaking includes:

(a) A ROW for an approximate 10 foot wide and 11.8 mile long water supply pipeline that would extend from the Seeley Waste Water Treatment Plant. The pipeline would be buried 30 inches below grade in the shoulder of the existing ROW of the Evan Hewes Highway. A survey corridor for cultural resources for this linear element was established as a 75-foot buffer on either side of the center line (150 foot corridor) to allow for changes in the ROW to avoid cultural resources.

(b) A ROW for temporary or permanent access roads required outside the plant footprint is approximately 30 feet. A survey corridor for cultural resources for this linear element was established as a 50-foot buffer on either side of the center line (100 foot corridor) to allow for changes in the ROW to avoid cultural resources.

(c) The ROW for the 230 kV transmission line is defined as an approximately 100 foot wide and 10.3 mile long corridor that extends to the San Diego Gas and Electric Company Imperial Valley Substation A survey corridor for cultural resources for this linear element was established as a 150-foot buffer on either side of the center line (300 foot corridor) to allow for changes in the ROW to avoid cultural resources.

(d) Project maps and illustrations are provided in Appendix E to this Agreement.

ii) Historic properties not located within the areas described in Stipulation II(a)(i) that could sustain direct or indirect non-physical effects, including visual, auditory, and atmospheric, as a result of the undertaking and is defined to include.

(1) Cultural resources identified through a review of existing literature and records search, information or records on file with the BLM or at the SIC, interviews or discussions with local professional or historical societies and local experts in history or archaeology. Specific areas of concern or cultural resources that were identified include:

(a) Cultural resources in the Yuha Area of Critical Environmental Concern

(2) Any cultural resource or location which has been included in the Native American Heritage Commission Sacred Lands Files, identified through a literature review or records search, or identified by an Indian Tribe, Tribal organization, or individual through consultation as having religious or cultural significance. Specific areas of concern or cultural resources that have been identified through consultation include:

(a) Certain geological features or places to which the Tribes attach religious or cultural significance.
(b) Cremations/burials located within or in proximity to the undertaking.

(3) Any cultural resource or location which has been identified by a consulting party, organization, governmental entity, or individual through consultation or the public commenting processes as having significance or being a resource of concern. Areas identified through consultation include:

(a) Juan Bautista De Anza National Historic Trail (Anza NHT)

(i) The Anza NHT corridor is designated pursuant to the National Trails Act. The corridor has historic values, as well as recreation and visitor experience values.
(ii) No identifiable and recognizable physical evidence or historic properties associated with the historic trail have yet been identified within the APE for direct effects. Specific areas of concern or cultural resources have been identified both south and north of the project location and include:

1. Yuha Well (Anza Camp 47)
2. Anza Camp 48
3. San Sebastian Marsh (Anza Camp 49)

(b) Sites associated with the 1781 Rivera Expedition

(i) No identifiable and recognizable physical evidence or historic properties associated with the Rivera Expedition occur within the APE for direct effects.

(4) Built-environment resources

(a) The APE is expanded to include a half-mile buffer from the project site and above-ground linear facilities to encompass historic properties whose historic setting could be adversely affected. Specific areas of concern or cultural resources have been identified both south and north of the project location and include:

(i) Imperial Irrigation District hydraulic irrigation system components
(ii) Highway 80 (Evan Hewes Highway) and remnants
(iii)San Diego and Arizona Railroad
(iv)U.S. Gypsum Rail-Line
(v) Plaster City Gypsum Plant

(5) Cultural resources identified through surveys where access was granted and windshield surveys where there was no allowed access within a half mile of the APE for direct effects.

(6) Cultural resources identified through a review of the existing literature, information and records search at the BLM El Centro Field Office and at the SIC, for cultural resources that are located within a one mile buffer of the project area and ¼-mile from each linear project feature.

(a) Historic Districts and Landscapes

(i) Yuha Basin Discontiguous Archaeological District

(7) Cultural resources identified through archaeological or other field investigations for this undertaking that, as a result of project redesign to avoid direct effects to cultural resources, no longer occur within the APE for direct effects.

(a) Project redesign eliminated approximately 1200 acres of public lands on the eastern perimeter of the proposed project to avoid effects to potentially significant prehistoric archaeological sites and burial sites, reducing the generating capacity of power plant from 900 MW to 750 MW.

b) The APE encompasses an area sufficient to accommodate all of the proposed and alternative project components under consideration as of the date of the execution of this Agreement. If BLM determines in the future that unforeseen changes to the undertaking may cause alterations in the character or use of historic properties, if any such properties exist, in a geographic area or areas beyond the extent of the original APE above, then the BLM, in consultation with the Signatories and Invited Signatories shall modify the size of the APE using the process set forth in stipulation below.

i) Any party to this Agreement may propose that the APE established hereunder be modified. The BLM shall notify the Signatories and Invited Signatories of the proposal and consult for no more than 15 days to reach agreement on the proposal.

ii) If the Signatories agree to the proposal, then the BLM will prepare a description and a map of the modification to which the Signatories agree. The BLM will keep copies of the description and the map on file for its administrative record and distribute copies of each to the other Signatories and Invited signatories within 30 days of the day upon which agreement was reached.

iii) Upon agreement to a modification to the APE that adds a new geographic area, the BLM shall follow the processes set forth in Stipulation II to identify and evaluate historic properties in the new APE, assess the effects of the undertaking on any historic properties in the APE, and provide for the resolution of any adverse effects to such properties, known or subsequently discovered.

iv) If the Signatories cannot agree to a proposal for the modification of the APE, then they will resolve the dispute in accordance with Stipulation X.

II. IDENTIFICATION AND EVALUATION

a) The BLM, in coordination with the Energy Commission, has authorized the Applicant to conduct specific identification efforts for this undertaking including, but not limited to, a literature review, records search, cultural resources surveys, ethnographic studies, and geo-morphological studies to identify historic properties that might be located within the APE.

i) A cultural resources report (URS December 2009) has been submitted by the Applicant that presents the results of identification efforts to the BLM, the COE, and the Energy Commission and is currently under review. The BLM, the COE, and the Energy Commission will assess whether the report conforms with the field methodology and site description template required under BLM Fieldwork Authorization CA-670-06-07FA09 and Fieldwork Authorization CA-670-06-07FA10 and Energy Commission transaction number Data Requests Set 2, Part 2 #142, Docket number 08-AFC-5.

i) The BLM, in consultation with the Energy Commission, may require additional field investigations to ensure the accuracy of site recordation and to provide additional information to support site evaluations and the assessment of effects. The BLM, the COE, and the Energy Commission, separately or together, have the right and the discretion, under this Agreement, to request additional field studies.

ii) The BLM has consulted and shall respond to any request to consult with Tribes, Tribal organizations or tribal individuals regarding the identification of historic properties within the APE to which they attach religious or cultural significance.

b) The BLM shall make determinations of eligibility prior to the Record of Decision, and make the agency's determinations available to the consulting parties and the public for a 30 day review and comment period.

i) The BLM will respond to any request for consultation on its determinations from a consulting party to this Agreement or a Tribe.

ii) A consulting party may provide its comments directly to the SHPO within the 30 day comment period.

(1) Where a consulting party elects to provide comments directly to SHPO, the consulting party shall provide a copy of the comments to the BLM within the 30 day comment period.

iii) Absent comment within 30 days, the BLM may submit its determinations to SHPO for final review and comment.

iv) Where a consulting party or Tribe objects to the BLM's determination for a specific cultural resource within the 30 day review period, the BLM shall consult with the objecting party and the SHPO regarding the nature of the objection and reconsider its determinations.

(1) If the objection is not resolved, the BLM shall further consult with the SHPO and follow the processes provided at 36 CFR 800.4(c)(2).
(2) The BLM may proceed with determinations for all cultural resources not subject to objection.

v) The BLM and the Energy Commission shall coordinate to the extent feasible and practicable on determinations of eligibility for the NRHP and the CRHR.

(1) Cultural resources formally determined eligible for inclusion in the NRHP are listed on the CRHR per California Code of Regulations 4851(a)(1).
(2) If BLM determines that a cultural resource is not included or eligible for inclusion on the NRHP but the Energy Commission determines a cultural resource to be eligible for inclusion on the CRHR, the BLM and the Energy Commission shall

consult with the SHPO for 15 days to resolve disagreements with regard to eligibility.

(a) The SHPO shall have the final authority to resolve disagreements regarding eligibility for the CRHR.
   (i) If the SHPO determines that the cultural resource is eligible for the CRHR, the SHPO shall notify the Energy Commission and BLM and may request that BLM reconsider its determination.

vi) BLM will submit its determinations of eligibility to the SHPO for final review and comment.

(1) SHPO will have 30 days in which to review and comment.
(2) Absent comments within this time frame, BLM may assume, and formally document for the record, that the SHPO has elected not to comment and concurs with BLM's determinations.
(3) If the BLM and SHPO should not agree on the determination, BLM shall follow the processes provided at 36 CFR 800.4(c)(2) and seek a determination from the Keeper of the National Register.

c) The BLM may defer the formal and final evaluation of archaeological sites whose values are limited to the potential to yield information about history or prehistory and where testing or limited excavation is recommended to determine whether the site would be eligible under Criterion D for inclusion on the NRHP.

i) BLM may treat an unevaluated archaeological site whose values are limited to the potential to yield information about history or prehistory as a historic property for the purpose of project management. If adverse effects to an archaeological site which is being treated as a historic property cannot be avoided, the BLM must either evaluate the site and make a determination of eligibility or resolve the adverse effect by implementing the prescriptions of the HPTP.

ii) Where evaluation of archaeological sites for the potential to yield information may be deferred, the Applicant shall submit an analysis of the unevaluated cultural resources that the Undertaking appears likely to affect. The analysis shall detail which cultural resources that the undertaking appears to have no potential to affect, which cultural resources the Applicant commits to avoiding through the implementation of formal avoidance measures, and which cultural resources cannot be avoided and will be treated by implementing the prescriptions of the Historic Properties Treatment Plan (HPTP) required in Section III of the Agreement.

iii) The Applicant, at the direction of the BLM, the COE, and the Energy Commission, may prepare the analysis required above in phases that correspond to the proposed sequence of development for the Phase 1 330 MW and Phase 2 450 MW energy plant, or in phases for each block of 60 SunCatchers, provided that analyses are ultimately prepared for the entirety of the APE.

iv) Where additional evaluation efforts are required to assess the informational values of archaeological sites, the BLM and the Energy Commission shall ensure that cultural resources located within the APE are evaluated for the NRHP and the CRHR pursuant to the guidelines provided in Appendix A of this Agreement.

d) Where additional identification and evaluation efforts are required due to changes in the project and the APE, the BLM and the Energy Commission shall ensure that cultural resources located within the APE are identified and evaluated for the NRHP and the CRHR pursuant to Appendix A of this Agreement.

e) Amendment of the identification and evaluation process as set forth hereunder will not require amendment of this Agreement if all Signatories do so agree.

III. TREATMENT OF HISTORIC PROPERTIES

a) The resolution or mitigation of effects to historic properties shall be described in one or more HPTP(s) that shall be an attachment to Appendix B of this Agreement.

i) The BLM and the Applicant, in consultation with the consulting parties, shall seek to develop a draft HPTP prior to the ROD if feasible, or to otherwise develop a framework and consensus on the general treatment measures for affected historic properties that would be finalized in the HPTP.

(1) Prior to the issuance of any Notice to Proceed by BLM to initiate the undertaking or any component of the undertaking the Applicant shall develop and submit to BLM one or more HPTPs.
(2) The HPTP will be initiated after the ROW is granted by the BLM and issuance of a CWA section 505 permit by the COE but prior to the issuance of a Notice to Proceed for construction in those portions of the undertaking addressed by the HPTP.
(3) The BLM may authorize the phased implementation of the HPTP, or if appropriate, the development of individual cultural resources, issue oriented, or geographically focused HPTP(s).

ii) The BLM and the Energy Commission, to extent possible and consistent with the guidelines provided in Appendix B(2), shall coordinate on the development of the treatment or mitigation measures proposed in the Energy Commission's Conditions of Certifications and the treatment measures developed through the section 106 consultation process.

b) The BLM shall submit the HPTP to the consulting parties for a 30 day review period. Absent comments within this time frame, BLM may finalize the HPTP. BLM will provide the parties with written documentation indicating whether and how the draft HPTP will be modified in response to any timely comments received. If the HPTP is revised in response to comments, BLM shall submit the revised HPTP to all parties for a 15 day review period. Absent comments within this time frame, BLM will finalize the HPTP. BLM will provide the consulting parties a copy of the final HPTP.

c) Where the HPTP treats adverse effects to historic properties to which Tribes attach religious or cultural significance, the BLM shall submit the HPTP to the Tribes and seek their views comments through consultation, regardless of the status of a Tribe as a consulting party to this Agreement.

   i) BLM shall submit an HPTP which treats adverse effects to which a Tribe(s) attaches religious and cultural significance to the SHPO and the ACHP. BLM shall consult with the involved Tribe(s) on the distribution of the HPTP to the other consulting parties.

d) BLM shall ensure that a HPTP, developed in accordance with Appendix B of this Agreement, is implemented and completed.

e) BLM shall ensure that a Historic Property Management Plan (HPMP), which provides for the protection and management of historic properties during the operational life and decommissioning of the solar energy power plant, is developed and implemented in accordance with Appendix C of this Agreement.

f) Amendment of the HPTP or HPMP as set forth hereunder will not require amendment of this Agreement if all Signatories do so agree. If the Signatories do not agree to the amendment of the HPTP or HPMP, the disagreement will be resolved pursuant to the procedures in Section X of this Agreement.

IV. DISCOVERIES AND UNANTICIPATED EFFECTS

a) If the BLM determines during implementation of the HPTP that either the HPTP or the undertaking will affect a previously unidentified property that may be eligible for the NRHP, or affect a known historic property in an unanticipated manner, the BLM will address the discovery or unanticipated effect in accordance with those provisions of the HPTP that relate to the treatment of discoveries and unanticipated effects. BLM at its discretion may hereunder assume any discovered property to be eligible for inclusion in the National Register. BLM compliance with this stipulation shall satisfy the requirements of 36 CFR 800.13(a)(2).

V. TREATMENT OF HUMAN REMAINS OF NATIVE AMERICAN ORIGIN

a) The parties to this Agreement agree that Native American burials and related items discovered on BLM administered lands during implementation of the terms of the Agreement will be treated in accordance with the requirements of the NAGPRA. The BLM will consult with concerned Indian Tribes, Tribal Organizations, or individuals in accordance with the requirements of §§ 3(c) and 3(d) of the NAGPRA and implementing regulations found at 43 CFR Part 10 to address the treatment of Native American burials and related cultural items that may be discovered during implementation of this Agreement.

b) In consultation with the Tribes, the BLM shall seek to develop a written plan of action pursuant to 43 CFR 10.5(e) to manage the inadvertent discovery or intentional excavation of human remains, funerary objects, sacred objects, or objects of cultural patrimony. The plan of action shall be included in the Appendices to this Agreement.

c) The BLM shall ensure that Native American burials and related cultural items on private lands are treated in accordance with the requirements of §§ 5097.98 and 5097.991 of the California Public Resources Code, and § 7050.5(c) of the California Health and Human Safety Code.

VI. STANDARDS AND QUALIFICATIONS

a) PROFESSIONAL QUALIFICATIONS. All actions prescribed by this Agreement that involve the identification, evaluation, analysis, recordation, treatment, monitoring, and disposition of historic properties and that involve the reporting and documentation of such actions in the form of reports, forms or other records, shall be carried out by or under the direct supervision of a person or persons meeting, at a minimum, the Secretary of the Interior's Professional Qualifications Standards (PQS), as appropriate (48 FR. 44739). However, nothing in this stipulation may be interpreted to preclude any party qualified under the terms of this paragraph from using the services of properly supervised persons who do not meet the PQS.

b) DOCUMENTATION STANDARDS. Reporting on and documenting the actions cited in this Agreement shall conform to every reasonable extent with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR. 44716-44740), as well as, the BLM 8100 Manual, the California Office of Historic Preservation's Preservation Planning Bulletin Number 4(a) December 1989, Archaeological Resource Management Reports (ARMR): Recommended Contents and Format (ARMR Guidelines) for the Preparation and Review of Archaeological Reports, and any specific county or local requirements or report formats as necessary.

c) CURATION STANDARDS. On BLM-administered land, all records and materials resulting from the actions cited in Stipulation III, IV and V of this Agreement shall be curated in accordance with 36 C.F.R. Part 79, and the provisions of the NAGPRA, 43 C.F.R. Part 10, as applicable. To the extent permitted under §§ 5097.98 and 5097.991 of the California Public Resources Code, the materials and records resulting from the actions cited in Stipulation III and IV of this Agreement for private lands shall be curated in accordance with 36 CFR Part 79. The BLM will seek to have the materials donated through a written donation agreement to be curated with other cultural materials. The BLM will attempt to have all collections curated at one location unless otherwise agreed to by the consulting parties

VII. REPORTING REQUIREMENTS

a) Within eighteen (18) months after the BLM, in consultation with the Energy Commission, has determined that all fieldwork required by Stipulation II and III has been completed, the BLM will ensure preparation, and concurrent distribution to the consulting parties as appropriate a written draft report that documents the results of implementing the requirements of Stipulation II or III. The consulting parties will be afforded 30 days following receipt of the draft report to submit any written comments to the BLM. Failure of these parties to respond within this time frame shall not preclude the BLM from authorizing revisions to the draft report as the BLM may deem appropriate. The BLM will provide the consulting parties with written documentation indicating whether and how the draft report will be modified in accordance with any reviewing party comments. Unless the reviewing parties object to this documentation in writing to the BLM within 14 days following receipt, the BLM may modify the draft report as the BLM may deem appropriate. All objections shall be resolved pursuant to Stipulation X. Thereafter, the BLM may issue the report in final form and distribute this document in accordance with Stipulation VII(b).

b) Unless otherwise requested, one paper copy of final reports documenting the results of implementing the requirements of Stipulation II or III, will be distributed by the BLM to the consulting parties and to the California Historical Resources Information Survey (CHRIS) Regional Information Center.

c) The BLM shall ensure that any draft document that communicates, in lay terms, the results of implementing the requirements of Stipulation II or III, to members of the interested public, is distributed for review and comment concurrently with and in the same manner as that prescribed for the draft technical report prescribed by Stipulation VII(a). If the draft document prescribed hereunder is a publication such as a report or brochure, publication shall upon completion be distributed by the BLM to the consulting parties, and to any other entity that the consulting parties may deem appropriate.

VIII. IMPLEMENTATION OF THE UNDERTAKING

a) The BLM may authorize construction activities and manage the implementation of HPTP(s) in phases corresponding to the construction phases of the undertaking.

   i) Upon approval of an HPTP(s) for the Phase 1 300 MW component, BLM may authorize a Notice to Proceed for construction activities.

(1) An HPTP(s) for the Phase 2 450 MW component may be developed and implemented after approval of the HPTP and issuance of the Notice to Proceed above for the Phase 1 component.

b) The BLM may authorize construction activities, including but not limited to those listed below, to proceed in specific geographic areas of the undertaking's APE where there are no historic properties, where there will be no effect to historic properties, a monitoring and discovery plan has been approved, an HPTP has been approved and initiated, or the activity would not preclude preservation or protection of historic properties in an area for which an HPTP has not been approved. Such construction activities may include:

(1) the demarcation, set up, and use of staging areas for the project's construction,
(2) the conduct of geotechnical boring investigations or other geophysical and engineering activities, and
(3) construction activities such as grading, buildings, and installations of SunCatchers.

c) Initiation of any construction activities on federal lands shall not occur until after the ROD and Notices to Proceed have been issued by the BLM.

IX. AMENDMENTS TO THE AGREEMENT

a) This Agreement may be amended only upon written agreement of the Signatories.

b) Any party to this Agreement may at any time propose amendments.

i) Upon receipt of a request to amend this Agreement, the BLM will immediately notify the other consulting parties and initiate a 30 day period to consult on the proposed amendment, whereupon all parties shall consult to consider such amendments.

ii) If agreement to the amendment cannot be reached within the 30 day period, resolution of the issue may proceed by following the dispute resolution process in Stipulation X.

iii) This Agreement may be amended when such an amendment is agreed to in writing by all Signatories.

c) Any party to this Agreement may at any time propose modifications to the Appendices.

i) Each Appendix to the Agreement may be individually modified without requiring amendment of the Agreement, unless the Signatories through such consultation decide otherwise.

ii) Upon receipt of a request to modify an Appendix, BLM will immediately notify the Signatories and determine the appropriate Invited Signatories and Concurring parties to consult on the proposed modifications and initiate a 30 day consultation period, whereupon all parties shall consult to consider such modification.

iii) If agreement on the modification cannot be reached within the 30 day period, resolution of the issue may proceed by following the dispute resolution process in Stipulation X(c).

iv) Modifications to an Appendix shall take effect on the date that they are executed by the Signatories.

d) Amendments to this Agreement shall take effect on the dates that they are fully executed by the Signatories.

e) If the Agreement is not amended through the above process, any consulting party to this Agreement may terminate its participation in the Agreement in accordance with Stipulation XI.

X. DISPUTE RESOLUTION

a) Should the Signatories or Invited Signatories object at any time to the manner in which the terms of this Agreement are implemented, the BLM will immediately notify the other Signatories and Invited Signatories and initiate a 30 day period in which to resolve the objection.

b) If the objection can be resolved within the consultation period, the BLM may authorize the disputed action to proceed in accordance with the terms of such resolution.

c) If at the end of the 30 day consultation period, the objection cannot be resolved through such consultation, the BLM will forward all documentation relevant to the objection to the ACHP per 36 CFR 800.2(b)(2). Any comments provided by the ACHP within 30 days after its receipt of all relevant documentation will be taken into account by the BLM in reaching a final decision regarding the objection. The BLM will notify the Signatories, Invited Signatories, and Concurring Parties in writing of its final decision within 14 days after it is rendered.

d) The BLM's responsibility to carry out all other actions under this Agreement that are not the subject of the objection will remain unchanged.

e) At any time during implementation of the terms of this Agreement, should an objection pertaining to the Agreement be raised by a Concurring party or a member of the interested public, the BLM shall immediately notify the Signatories, Invited Signatories, and other Concurring parties, consult with SHPO about the objection, and take the objection into account. The other consulting parties may comment on the objection to the BLM. The BLM shall consult with the objecting party(ies) for no more than 30 days. Within 14 days following closure of consultation, the BLM will render a decision regarding the objection and notify all parties of its decision in writing. In reaching its final decision, the BLM will take into account all comments from the parties regarding the objection. The BLM shall have the authority to make the final decision resolving the objection. Any dispute pertaining to the NRHP eligibility of historic properties or cultural resources covered by this agreement will be addressed by the BLM per 36 CFR 800.4(c)(2).

XI. TERMINATION

a) The Signatories have the sole authority to terminate this Agreement. The Invited Signatories may propose termination and may terminate their participation in this Agreement. If this Agreement is not amended as provided for in Stipulation IX, or if a Signatory or Invited Signatory proposes termination of this Agreement for other reasons, the party proposing termination shall notify the other Signatories and Invited Signatories in writing, explain the reasons for proposing termination, and consult for no more than 60 days to resolve the objection.

b) If a Concurring party seeks termination of this Agreement, they may terminate their participation and shall notify the Signatories and Invited Signatories in writing, explain the reasons for proposing termination or terminating their participation, and consult for no more than 60 days to resolve the objection.

c) Should consultation result in an agreement to resolve the objection, the Signatories shall proceed in accordance with that agreement.

d) Should such consultations fail, the Signatory or Invited Signatory proposing termination may terminate its participation in this Agreement by notifying the other parties in writing.

e) Should the entire Agreement be terminated, then the BLM and the COR, separately if necessary, shall either consult in accordance with 36 CFR 800.14(b) to develop a new agreement or request the comments of the ACHP pursuant to 36 CFR 800.4-800.6.

XII. WITHDRAWAL OR ADDITION OF PARTIES FROM/TO THE AGREEMENT

a) The BLM will respond to any written request for consulting party status pursuant to 36 CFR 800.2 and 36 CFR 800.3(f).

   i) Should a Concurring Party determine that its participation in the undertaking and this Agreement is no longer warranted, the party may withdraw from participation by informing the BLM of its intention to withdraw as soon as is practicable. The BLM shall inform the other consulting parties to this Agreement of the withdrawal.

ii) Should conditions of the undertaking change such that other state, federal, or tribal entities not already party to this agreement request to participate, the BLM will notify the other consulting parties and invite the requesting party to participate in the Agreement. The Agreement shall be amended following the procedures in Stipulation IX.

XIII. DURATION OF THIS AGREEMENT

a) This Agreement will expire if the undertaking has not been initiated and the BLM right-of-way grant expires or is withdrawn, or the stipulations of this Agreement have not been initiated within five (5) years from the date of its execution. At such time, and prior to work continuing on the undertaking, the BLM and the COE shall either (a) execute a memorandum of agreement pursuant to 36 CFR 800.6, or (b) request, take into account, and respond to the comments of the ACHP under 36 C.F.R. 800.7. Prior to such time, the BLM and the COE may consult with the other consulting parties to reconsider the terms of the Agreement and amend it in accordance with Stipulation IX. The BLM and the COE shall notify the Signatories as to the course of action they will pursue within 30 days.

b) This Agreement expires 25 years from its effective date unless extended by written agreement of the Signatories. The Signatories and Invited Signatories shall consult at year 10 to review this Agreement. Additionally, the Signatories and Invited Signatories shall consult not less than one year prior to the expiration date to reconsider the terms of this Agreement and, if acceptable, direct the Signatories extend the term of this Agreement. Reconsideration may include continuation of the Agreement as originally executed or amended, or termination. Extensions are treated as amendments to the Agreement under Stipulation IX.

c) Unless the Agreement is terminated pursuant to Stipulation XI, another agreement executed for the undertaking supersedes it, or the undertaking itself has been terminated, this Agreement will remain in full force and effect until BLM, in consultation with the other Signatories, determines that implementation of all aspects of the undertaking has been completed and that all terms of this Agreement and any subsequent tiered agreements have been fulfilled in a satisfactory manner. Upon a determination by BLM that implementation of all aspects of the undertaking have been completed and that all terms of this Agreement and any subsequent tiered agreements have been fulfilled in a satisfactory manner, BLM will notify the consulting parties of this PA in writing of the agency's determination. This Agreement will terminate and have no further force or effect on the day that BLM so notifies the Signatories to this Agreement.

XIV. EFFECTIVE DATE

a) This Agreement and any amendments shall take effect on the date that it has been fully executed by the Signatories. The Agreement and any amendments thereto shall be executed in the following order: (1) Applicant, (2) Energy Commission, (3) NPS, (4) COE, (5) BLM, (6) SHPO, and (7) ACHP.

Execution and implementation of this Agreement is evidence that the BLM and the COE have taken into account the effect of this undertaking on Historic properties, afforded the ACHP a reasonable opportunity to comment, and that the BLM and the COE have satisfied their responsibilities under section 106 of the NHPA. The Signatories and Invited Signatories to this PA represent that they have the authority to sign for and bind the entities on behalf of whom they sign

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SIGNATORY PARTIES

U.S. BUREAU OF LAND MANAGEMENT

BY: ______________________________ DATE: ______________

James Wesley Abbot
State Director

U.S. ARMY CORPS OF ENGINEERS, LOS ANGELES DISTRICT

BY: ______________________________ DATE: ______________

David J. Castanon
Chief, Regulatory Division

CALIFORNIA STATE HISTORIC PRESERVATION OFFICER

BY: ______________________________ DATE: ______________

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

ADVISORY COUNCIL ON HISTORIC PRESERVATION

BY: ______________________________ DATE: ______________

John Fowler
Executive Director

INVITED SIGNATORY PARTIES

CALIFORNIA ENERGY COMMISSION

BY: ______________________________ DATE: ______________

TESSERA SOLAR L.L.C.

BY: ______________________________ DATE: ______________

CONCURRING PARTIES:

(This is a potential list only)
CAMPO KUMEYAAY NATION
COCOPAH INDIAN TRIBE
FORT YUMA QUECHAN INDIAN TRIBE
EWIIAAPAAYP BAND OF KUMEYAAY INDIANS
JAMUL INDIAN VILLAGE
KWAAYMII LAGUNA BAND OF INDIANS
LA POSTA BAND OF KUMEYAAY INDIANS
MANZANITA BAND OF KUMEYAAY INDIANS
SAN PASQUAL BAND OF DIEGUENO INDIANS
SANTA YSABEL BAND OF DIEGUENO INDIANS
AH-MUT PIPA FOUNDATION
KUMEYAAY CULTURAL REPATRIATION COMMITTEE
CALIFORNIA UNIONS FOR RELIABLE ENERGY
NATIONAL TRUST FOR HISTORIC PRESERVATION
NATIONAL PARK SERVICE
ANZA SOCIETY
EDIE HARMON
SACRED LANDS INSTITUTE
GREG P. SMESTAD, PH.D.

APPENDIX A: IDENTIFICATION AND EVALUATION

I. IDENTIFICATION

a) The BLM will ensure that all cultural resources identified during cultural resources survey are recorded on new or updated California Department of Parks and Recreation Form DPR 523 (Series 1/95), using the “Instructions for Recording Historical Resources” (Office of Historic Preservation, March 1995).

i) Previously unrecorded cultural resources which have religious or cultural significance to Tribes identified during cultural resources investigations and/or through consultations with Tribes may be recorded on the California DPR Form 523, unless a Tribe, Tribal Organization, or an individual from a Tribe objects. If such objection arises, the properties may be recorded on a form and in a manner that is in accordance with the recommendations of the Tribe, Tribal Organization, or of the individual. If the traditional cultural property is also a historical or archaeological site, those components of site will be recorded on the appropriate DPR form and filed with CHRIS.

b) The cultural resources contractor will obtain permanent site numbers from California Historical Resources Information System (CHRIS) regional information center.

c) The BLM, in consultation with the COE, the Energy Commission, and the SHPO, shall review all site records for accuracy, adequacy of information, and completeness and determine whether they are sufficient to support agency determinations and findings. Final approved site records shall be submitted to the CHRIS. Permanent site numbers shall then be used in all final reports and other documents prepared pursuant to the requirements of this Agreement.

d) The BLM, in consultation with the COE and the Energy Commission will ensure that cultural resources survey reports are responsive to Energy Commission Data Requests.

II. EVALUATION

a) The BLM shall authorize field investigations for the purposes of evaluation of the potential site types identified in the APE listed below (but not limited to) for the purpose of evaluating the information potential and significance of the cultural resources in the APE.

Prehistoric Archaeological Resources
Potential Lake Cahuilla Shoreline District
Chipped Stone Deposits
Sparse Lithic Scatters
Chipped and Ground Stone Deposits

Ceramic Deposits
Archaeological Deposits that Include FAR Concentrations
Trail Segments

Historical Archaeological Resources
Potential Early Twentieth Century Sand and Gravel Mining Landscape
Surveying Monuments
Historic Refuse Deposits
Pebble and Cobble Concentrations

Unique Archaeological Resources

b) BLM shall consult with Indian Tribes and seek the views and comments of Tribal Organizations and individual tribal members regarding any unevaluated archaeological site to which they may attach religious or cultural significance in order to ascertain the status of these places relative to NRHP and CRHR eligibility criteria.

APPENDIX B: HISTORIC PROPERTIES TREATMENT PLAN(S)

I. HISTORIC PROPERTIES TREATMENT PLAN(S

a) Any HPTP tiered from the Agreement shall include but is not limited to:

i) A list of the historic properties subject to the HPTP, determined or treated as eligible for project management purposes, in the undertaking's APE that the construction of the Project will unconditionally avoid,

ii) The measures that the Applicant will take to avoid, minimize, or mitigate the adverse effects on historic properties,

iii) Provide a plan for monitoring during construction, which would include the treatment of inadvertent discoveries and the participation of tribal cultural specialists. The following shall be considered during development of these plans:

(a) qualifications archaeological monitors
(b) participation of tribal cultural specialists in monitoring
(c) areas in the APE requiring monitoring
(d) authority of monitors to halt work
(e) protective measures for historic properties
(f) communication protocols
(g) safety and resource training
(h) procedures upon discovery
(i) evaluation of the inadvertent discoveries
(j) implementation of standard treatment measures
(k) field protocol upon discovery of human remains

iv) The proposed disposition of recovered materials and records shall be curated in accordance with Stipulation VI(c).

v) The procedures for treatment and disposition of any human remains, funerary objects, sacred objects, and objects of cultural patrimony in accordance with NAGPRA and the California Health and Safety Code 7050.5 as appropriate.

vi) A research design which addresses significant themes and questions for the types of historic properties to receive treatment.

vii) A schedule for completing treatment measures, including analysis, reporting and disposition of materials and records, as well as a schedule for completing the draft and final data recovery report(s).

viii) A description of alternative treatments for adverse effects that are not data recovery and that may include (but is not limited to):

(1) Placement of construction within portions of historic properties that do not contribute to the qualities that make the resource eligible
(2) Deeding cemetery areas into open-space in perpetuity and providing the necessary long-term protection measures
(3) Public interpretation including the preparation of a public version of the cultural resources studies and/or education materials for local schools
(4) Access by tribes to traditional areas in property after the project has been constructed
(5) Support by Applicant to cultural centers in the preparation of interpretive displays
(6) Consideration of other off-site mitigation

b) Any treatment plan tiered from this Agreement or the HPTP shall reflect the ACHP archaeological guidance at http://www.achp.gov/archguide/, the BLM 8100 Manual, and the Secretary of the Interior's Standards for the Treatment of Historic Properties.

II. COORDINATION WITH ENERGY COMMISSION MEASURES UNDER CEQA

a) Guidelines for implementation codified in the California Code of Regulations (CCR), Title 14, Chapter 3, Sections 15000 et seq., requires state and local public agencies to identify the environmental impacts of proposed discretionary activities or projects, determine if the impacts will be significant, and identify alternatives and mitigation measures that will substantially reduce or eliminate significant impacts to the environment. Pursuant to section 15126.4(a)(1), feasible measures which could minimize adverse impacts must be described in the environmental assessment.

i) Section 15221(b) provides that because NEPA does not require separate discussion of mitigation measures, these points of analysis will need to be added, supplemented, or identified before the EIS can be used as an EIR.

ii) Section 15126.4(a)(1)(B) states that formulation of mitigation measures should not be deferred until some future time, but that measures may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way.

III. PERFORMANCE STANDARDS FOR SECTION 106 AND CEQA MITIGATION

a) Cultural mitigation measures and performance standards considered within the section 106 consultation and CEQA process include, but are not limited to:

i) Avoidance

(1) For cultural resources, the preferred method of mitigation is avoidance of all cultural resources wherever possible. Mitigation measures are normally developed to reduce impacts to significant cultural resources.

ii) Archaeological Data Recovery

(1) When data recovery through excavation is the only feasible mitigation, a data recovery plan, which makes provision for adequately recovering the scientifically consequential information from and about the historical resource, shall be prepared and adopted prior to any excavation being undertaken.

(2) Data recovery shall not be required for an historical resource if the lead agency determines that testing or studies already completed have adequately recovered the scientifically consequential information from and about the archaeological or historical resource.

iii) Built-Environment Resources

(1) Documenting built-environment resources in accordance with the standards and guidelines provided by the Historic American Building Survey (HABS), Historic American Engineering Record (HAER), Historic American Landscape Survey (HALS).

(2) Relocating or moving historic buildings, objects or structures out of the APE.

iv) Properties of Sacred or Cultural Significance to Indian Tribes

(1) Cremation/Burial Sites

(a) Avoidance of cremation or burial sites is the preferred management alternative.

(b) Where avoidance of direct physical effects is not achievable, treatment shall follow the provisions of the NAGRPA Plan of Action as provided in Appendix L.

(2) Trails

(a) Avoidance of direct physical effects to trails is the preferred management alternative.

(b) Where avoidance of direct physical effects is not achievable, treatment shall follow the provisions of the HPTP. A study of trails may be carried out to determine the nature and extent of the trail beyond the APE and may be considered within the context of a HALS study.

(3) Geological landforms or other places of sacred or cultural significance.

(a) BLM shall continue to seek information from the Tribe(s) or Tribal Organizations to determine the character and use of places of sacred or cultural significance.

(i) Maintenance of existing access to places of sacred and cultural significance is the preferred management alternative.

(b) Engineering solutions to eliminate or minimize direct or indirect non-physical effects will be identified, including but not limited to, orienting the SunCatchers to minimize glare, or erecting screens to eliminate glare.

v) Discoveries

(1) Following the discovery of significant resources, the Applicant shall ensure that the designated cultural resources specialist prepares a research design and a scope of work for any necessary data recovery or additional mitigation. The Applicant shall submit the proposed research design and scope of work to the BLM and/or Energy Commission's CPM for review and approval.

(2) The proposed research design and scope of work shall include (but not be limited to): a discussion of the methods to be used to recover additional information and any needed analysis to be conducted on recovered materials; a discussion of the research questions that the materials may address or answer by the data recovered from the project, and; discussion of possible results and findings.

vi) Monitoring

(1) Prior to the start of vegetation clearance or earth disturbing activities or project site preparation, the Applicant shall provide the designated cultural resources monitors and the BLM and/or Energy Commission's CPM with maps and/or drawings showing the footprint of the power plant and all linear facilities. Maps provided will include USGS 7.5-minute topographic quadrangle maps. If the designated cultural resource specialist requests enlargements or strip maps for linear facility routes, the Applicant shall provide them. If the footprint of the power plant or linear facilities changes, the Applicant shall provide maps and drawings reflecting these changes, to the cultural resources specialist within five days. Maps shall show the location of all areas where surface disturbance may be associated with project-related access roads, and any other project components.

(2) The designated cultural resource specialist shall be available at all times to respond within 24 hours after pre-construction or construction activities have been halted due to the discovery of a cultural resource(s). The specialist, or representative of the Applicant shall have the authority to halt or redirect construction activities if previously undiscovered cultural resource materials are encountered during vegetation clearance or earth disturbing activities or project site preparation or construction. If such resources are discovered, the designated

cultural resource specialist shall be notified and the Applicant or Applicant's representative shall halt construction in the immediate area in order to protect the discovery from further damage; project construction may continue elsewhere on the project.

vii) Qualifications

(1) Prior to the start of construction-related vegetation clearance, or earth-disturbing activities or project site preparation; or the movement or parking of heavy equipment onto or over the project surface, the Applicant shall provide the BLM and/or the Energy Commission CPM with the name and statement of qualifications for its designated cultural resource specialist and alternate cultural resource specialist, if an alternate is proposed, who will be responsible for implementation of all BLM cultural resources conditions and Energy Commission cultural resources conditions of certification. The statement of qualifications for the designated cultural resource specialist and alternate shall include all information needed to demonstrate that the specialist meets at least the minimum qualifications specified by the National Park Service, Heritage Preservation Services.

(2) Training

(a) Prior to the start of vegetation clearance or earth disturbing activities or project site preparation, the designated cultural resource specialist shall prepare an employee training program. The Applicant shall submit the cultural resources training program to the BLM, Energy Commission, and SHPO for review and written approval. If a video is used as part of the training program, the owner shall also submit the script for review and written approval.

(b) Prior to the start of vegetation clearance or earth disturbing activities or project site preparation, and throughout the project construction period as needed for all new employees, the Applicant shall ensure that the designated cultural resource trainer(s) provide(s) approved cultural resources training to all project managers, construction supervisors, or anyone coming on the construction site as an employee, contractor, subcontractor, or in any other capacity to complete work for the Applicant. The Applicant shall ensure that the designated trainer provides the workers with the approved a set of procedures for reporting any sensitive resources that may be discovered during project-related ground disturbance. In addition, the Applicant shall communicate the work curtailment procedures that the workers are to follow if previously undiscovered cultural resources are encountered during construction.

Historic Property Treatment Plans

1. Prehistoric Archaeological Sites
    a. Avoidance
    b. Minimize
        i. Strategic placement of transmission towers in areas of a site that would not adversely affect the information values
    c. Data recovery for historic properties eligible under Criterion D only
        i. Research Design
2. Historic Period Historic Properties
    a. Avoidance
    b. Minimize
    c. Data recovery for historic properties eligible under Criterion D only
        i. Research Design
            1. Sand and gravel mining
            2. Construction camps associated with the Railroad
    d. Historic built-environment Historic Properties with associative values
        i. San Diego and Arizona Railroad
        ii. Historic Highway 80
    e. Juan Bautista de Anza National Historic Trail
        i. Archaeological Investigations
        ii. Indicators for Paths or Trails
        iii. Monitoring
        iv. Interpretation (on and off-ste)

APPENDIX C: HISTORIC PROPERTIES MANAGEMENT PLAN

I. HISTORIC PROPERTIES MANAGEMENT PLAN

a) A Historic Properties Management Plan (HPMP) will be developed to further manage or prescribe additional treatment to historic properties within the APE during the future operation, maintenance and decommissioning of the Imperial Valley Solar Project and consider effects to historic properties in relation to those actions.

b) The BLM shall submit the HPMP to the consulting parties to the Agreement for a 60 day review period. Absent comments within this time frame, the BLM may finalize the HPMP. The BLM will provide the parties with written documentation indicating whether and how the draft HPMP will be modified in response to any timely comments received. If the HPMP is revised in response to comments, the BLM shall submit the revised HPMP to all parties for a 30 day review period. Absent comments within this time frame, the BLM will finalize the HPMP. The BLM will provide the parties a copy of the final HPMP.

APPENDIX D: PROJECT DESCRIPTION

The Imperial Valley Solar Project is a proposed 750-megawatt (MW) solar energy power plant. The project proposal also includes a 230-kilovolt (kV) on-site substation, 10.3 miles of 230 kV transmission line, an administrative building, maintenance complex, an 11.8 mile water line, and other related facilities. The proposed project would be built on approximately 6,140 acres of land administered by the BLM and 360 acres of private lands in Imperial County, California, approximately four miles east of the town of Ocotillo, and 14 miles west of the city of El Centro.

The proposed Imperial Valley Solar Project includes the following components:

a) A solar thermal power plant facility located approximately 14 miles west of El Centro, California in Imperial County.

b) The proposed project would be constructed in two phases utilizing SunCatcher (Sterling Engine) technology, and would include approximately 30,000 25 kilowatt (kW) solar power dishes with a generating capacity of approximately 750 megawatts (MW). Construction of the facility would proceed in blocks of 60 SunCatchers, which comprise a 1.5 MW group. Construction would take approximately 40 months to complete, but power would be available for transmission to the grid as each 60-unit group of SunCatchers is completed.

   i) The first phase would consist of up to 12,000 SunCatchers configured in arrays of 200 1.5 mW solar groups (60 SunCatchers/1.5 MW group) with a generating capacity of about 300 MW.

   ii) The second phase would consist of approximately 18,000 SunCatchers configured in 500 1.5 MW groups (60 SunCatchers/1.5 MW group) with a net generating capacity of 450 MW.

   iii) The SunCatcher is a 25-kilowatt-electrical (kW) solar dish system designed to automatically track the sun and collect and focus solar energy onto a power conversion unit (Stirling Engine, or PCU), which generates electricity. The system consists of a 40-foot-high by 38-foot-wide solar concentrator in a dish structure that supports an array of curved glass mirror facets. These mirrors collect and concentrate solar energy onto the solar receiver of the PCU

   1) Each SunCatcher dish would typically be mounted on a foundation consisting of a hollow single metal fin-pipe approximately 20 feet long and two feet in diameter that is hydraulically driven (vibrated) into the ground. This foundation is preferred because no concrete is required, no spoils are generated, and the foundations can be completely removed when the project is decommissioned.

2) When conditions are not conducive to the use of the metal pipe foundation, the foundation would consist of rebar-reinforced concrete constructed below grade. The SunCatcher pedestal on which the SunCatcher dish assembly is secured is approximately 18 feet 6 inches in height and would be an integrated part of the metal pipe foundation or would be a separate structure fastened to the rebar-reinforced concrete foundation at ground level.

3) Solar groups would be arranged as necessary to fit the contours of the site. SunCatchers would be aligned in rows approximately 112 feet apart, with access roads constructed between alternating rows of SunCatchers. Blading for roadways and foundations would be conducted between alternating rows to provide access to individual SunCatchers. Brush trimming would be conducted between the remaining rows and around the SunCatchers and consists of cutting the top of the existing brush while leaving the existing native plant root system in place to minimize soil erosion.

4) Electrical conduit and hydrogen delivery systems will be constructed in trenches connecting the SunCather units. Electrical conduit will be installed in trenches that are 24 inches wide and 30 inches deep. The hydrogen pipeline will be installed in trenches that are 4 inches wide and 24 inches deep.

c) Related structures include a main services complex, assembly buildings, a 230 kV electrical substation, access roads, an 11.8 mile water supply line, and a 10.3 mile 230 kV transmission line from the project site to the existing San Diego Gas and Electric (SDG&E) Imperial Valley Substation.

d) The solar power generation plant would be located on approximately 6,500 acres of land, including approximately 6,180 acres of public land administered by the Bureau of Land Management and 320 acres of privately owned land. This area would be fenced around the perimeter of the generation plant for security.

e) A 110 acre laydown/staging area and main services complex would be located along the east side of Dunaway Road and north of the Interstate 8 highway.

f) An off-site 6-inch-diameter water supply pipeline would be constructed a distance of approximately 11.8 miles from the Seeley Water Treatment Plant to the project boundary. The pipeline would be buried in a trench, approximately 30 inches deep, in the shoulder of the Evan Hewes Highway.

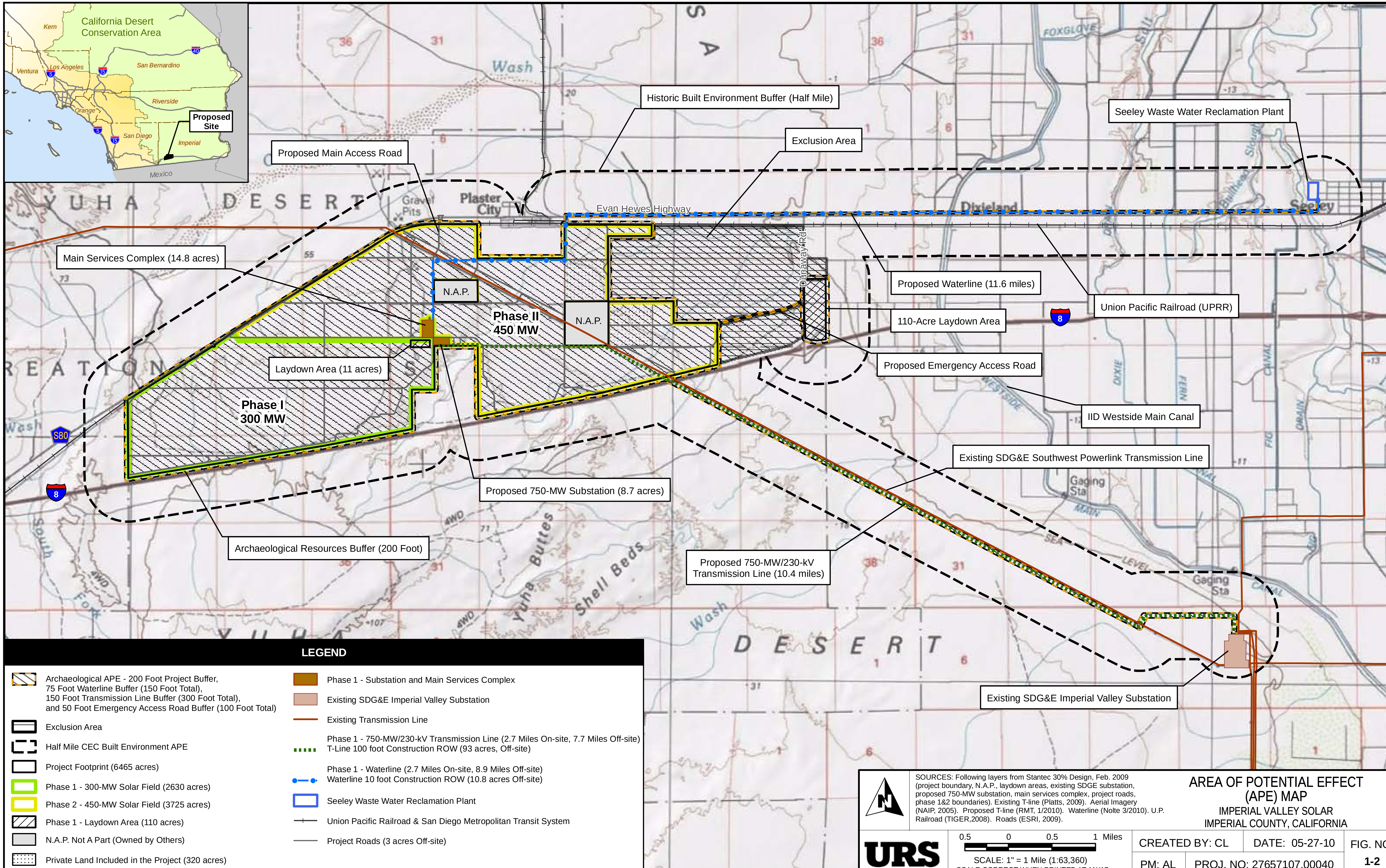
g) An off-site double-circuit generation interconnection transmission line would be constructed a distance of approximately 10 miles to connect the Imperial Valley Solar Project to the SDG&E Imperial Valley Substation. Approximately 7.56 miles of the 10.3-mile double-circuit generation interconnection transmission line would be constructed off-site from the solar power generation plant.

h) A arterial site access road, approximately 24 feet wide, would be constructed from Dunaway Road to the eastern boundary of the project site and generally follow an existing road.

i) The Applicant's Plan of Development proposes the construction of approximately 27 miles of paved arterial roads (24 feet wide, 102 acres of disturbance) to provide access to and throughout the site approximately 14 miles of unpaved perimeter roads (10 feet wide, 18 acres of disturbance) for access throughout the site, and approximately 234 miles (10 feet wide, 215 acres of disturbance) of unpaved routes for access to and maintenance of the SunCatchers.

APPENDIX E: PROJECT MAPS AND ILLUSTRATIONS

1. Map showing Area of Potential Effect
2. Project Overview Map
3. Phase I Construction Sequence
4. Phase 2 Construction Sequence
5.Photograph of SunCatcher Solar Dish Array
6. Illustrated Photograph of SunCatcher Solar Dish Array



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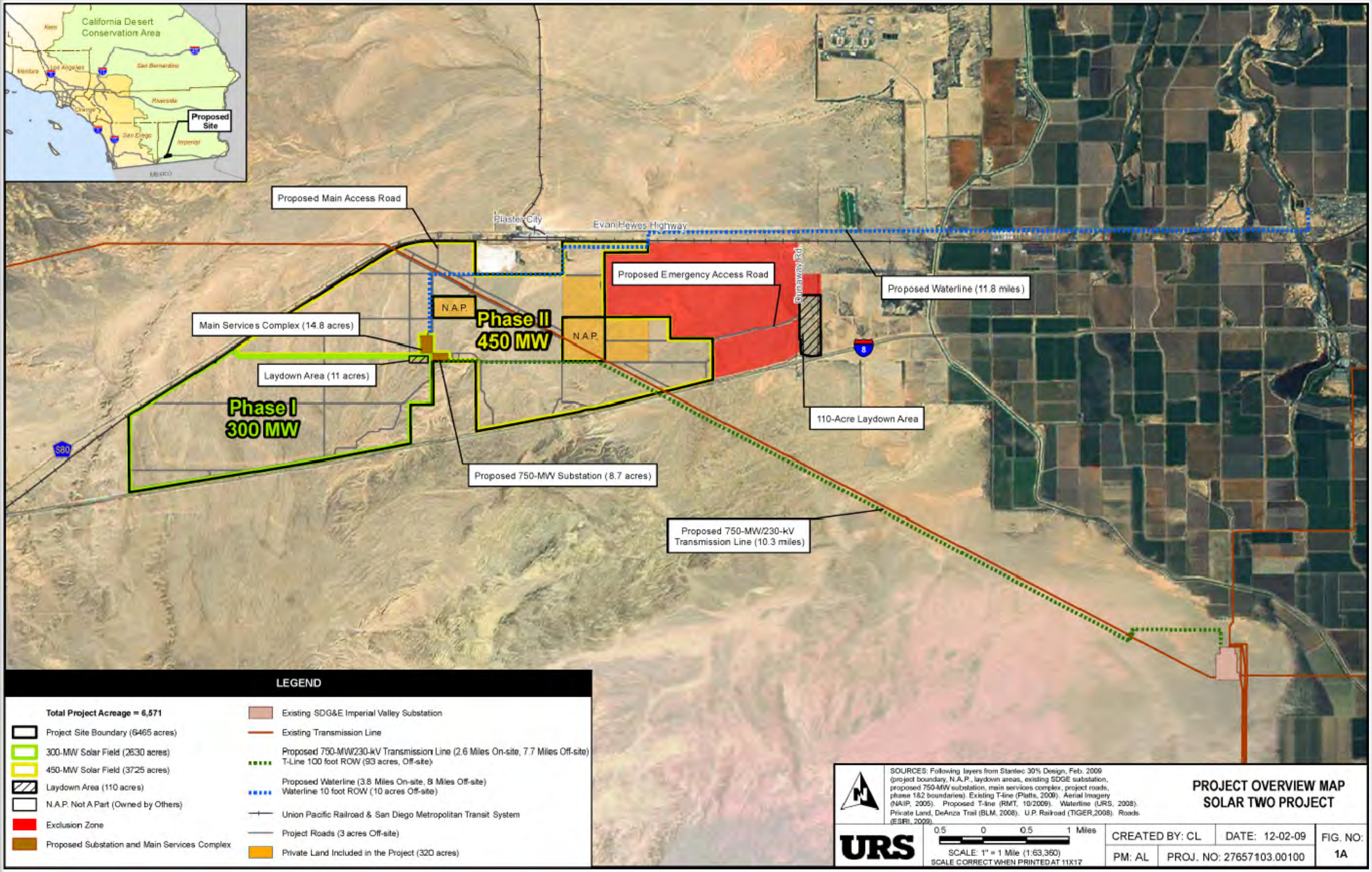
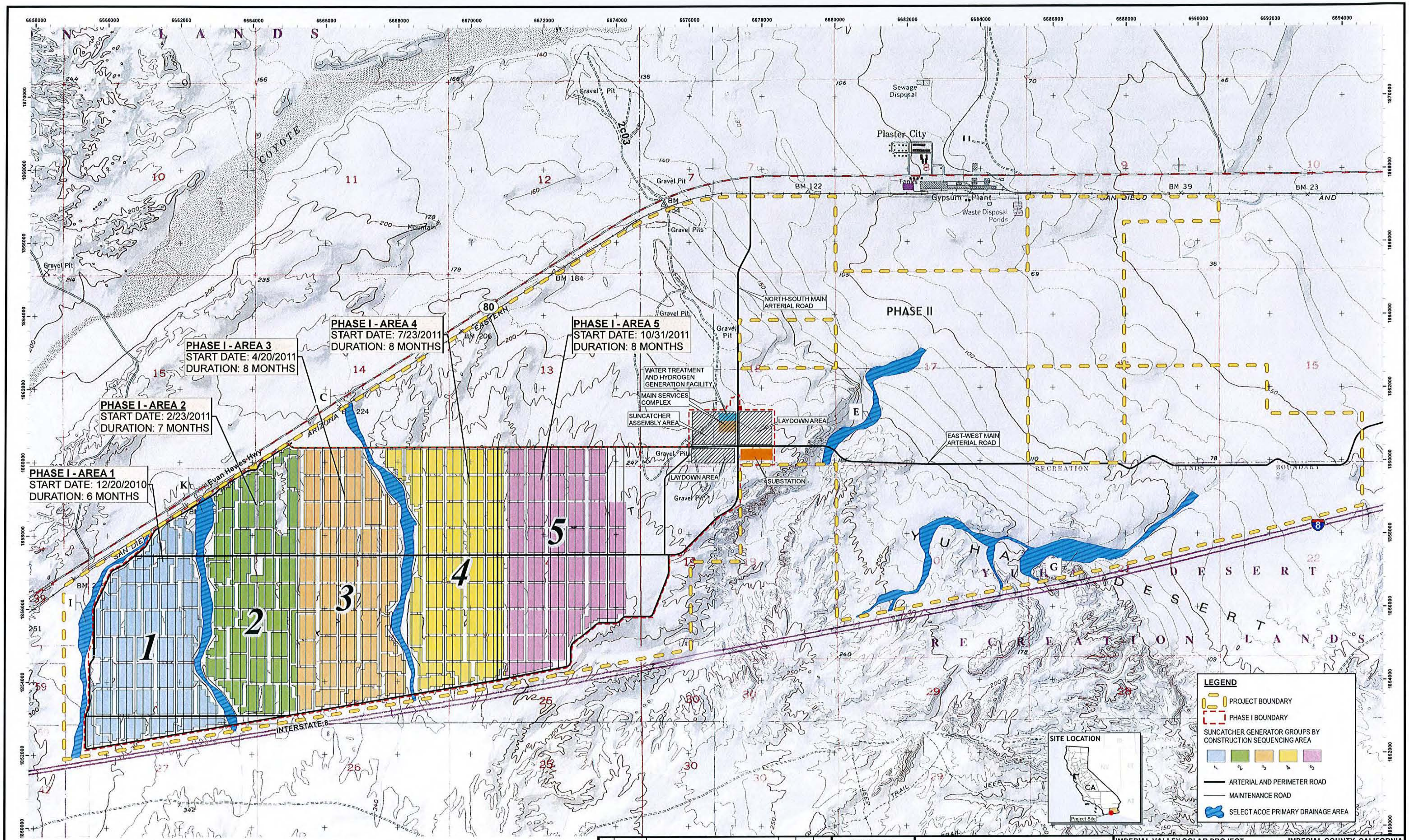
BRIEF OVERVIEW OF PROJECT

Project Map





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Cartographer: PAPEZ J

NOTES:

1. BASE MAP FROM U.S. GEOLOGICAL SURVEY 7.5 MINUTE QUADRANGLES. COUNTY MOSAICS OBTAINED FROM U.S. DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE.
2. MAP PROJECTION AND GRID COORDINATES ARE NAD83 STATE PLANE CALIFORNIA, ZONE VI, U.S. SURVEY FEET.

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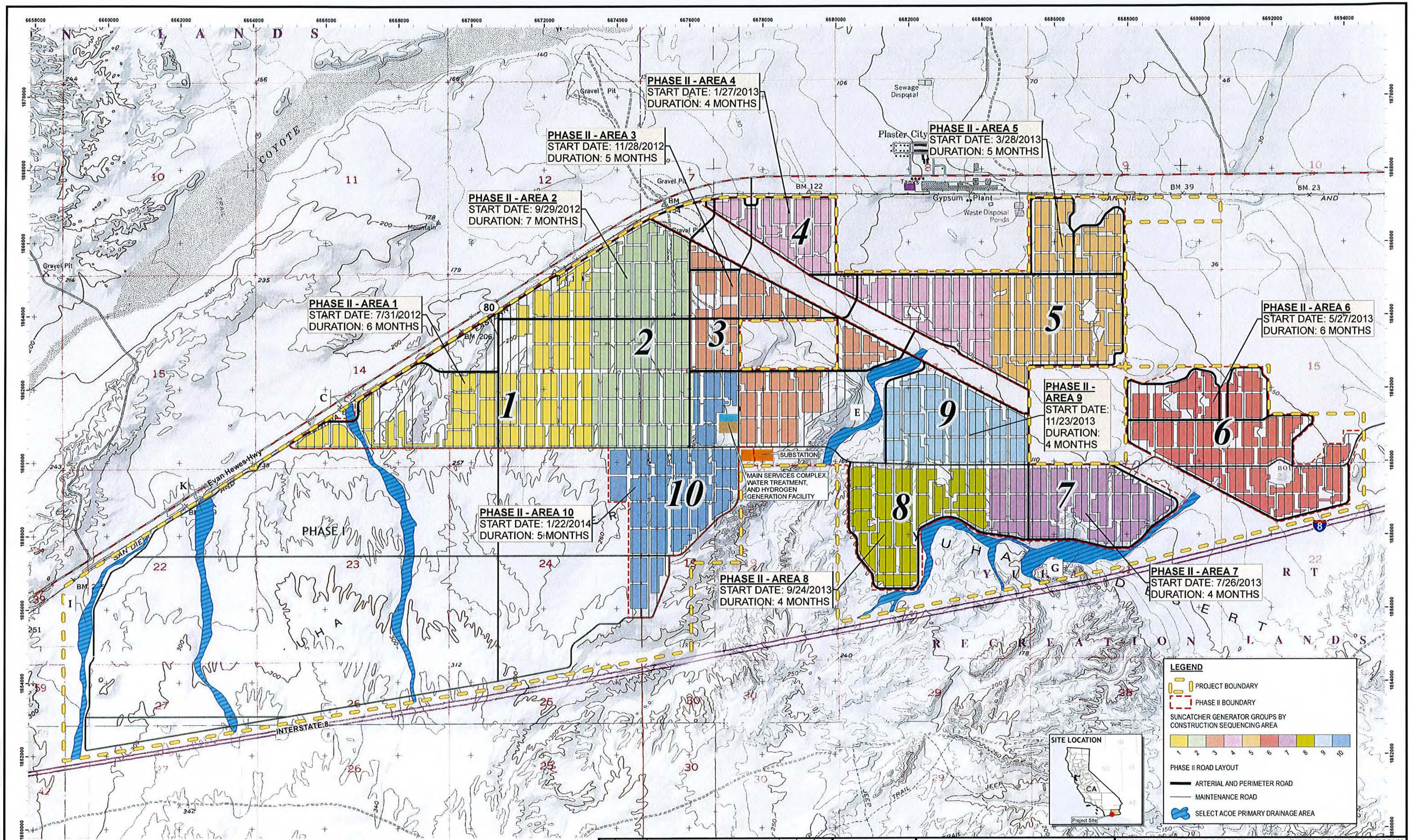
IMPERIAL VALLEY SOLAR PROJECT — IMPERIAL COUNTY, CALIFORNIA

PHASE I CONSTRUCTION SEQUENCE
SUNCATCHER INSTALLATION

SCALE:	PROJ. NO.	DWG. NAME	SHT NO.
AS NOTED	8163.02	081630233.mxd	FIGURE 2



NOTES:

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2. MAP PROJECTION AND GRID COORDINATES ARE NAD83 STATE PLANE CALIFORNIA, ZONE VI, U.S. SURVEY FEET.

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IMPERIAL VALLEY SOLAR PROJECT — IMPERIAL COUNTY, CALIFORNIA

PHASE II CONSTRUCTION SEQUENCE SUNCATCHER INSTALLATION

SCALE	PROJ. NO.	DWG. NAME	SHT NO.
AS NOTED	8163.02	081630234.mxd	FIGURE 4

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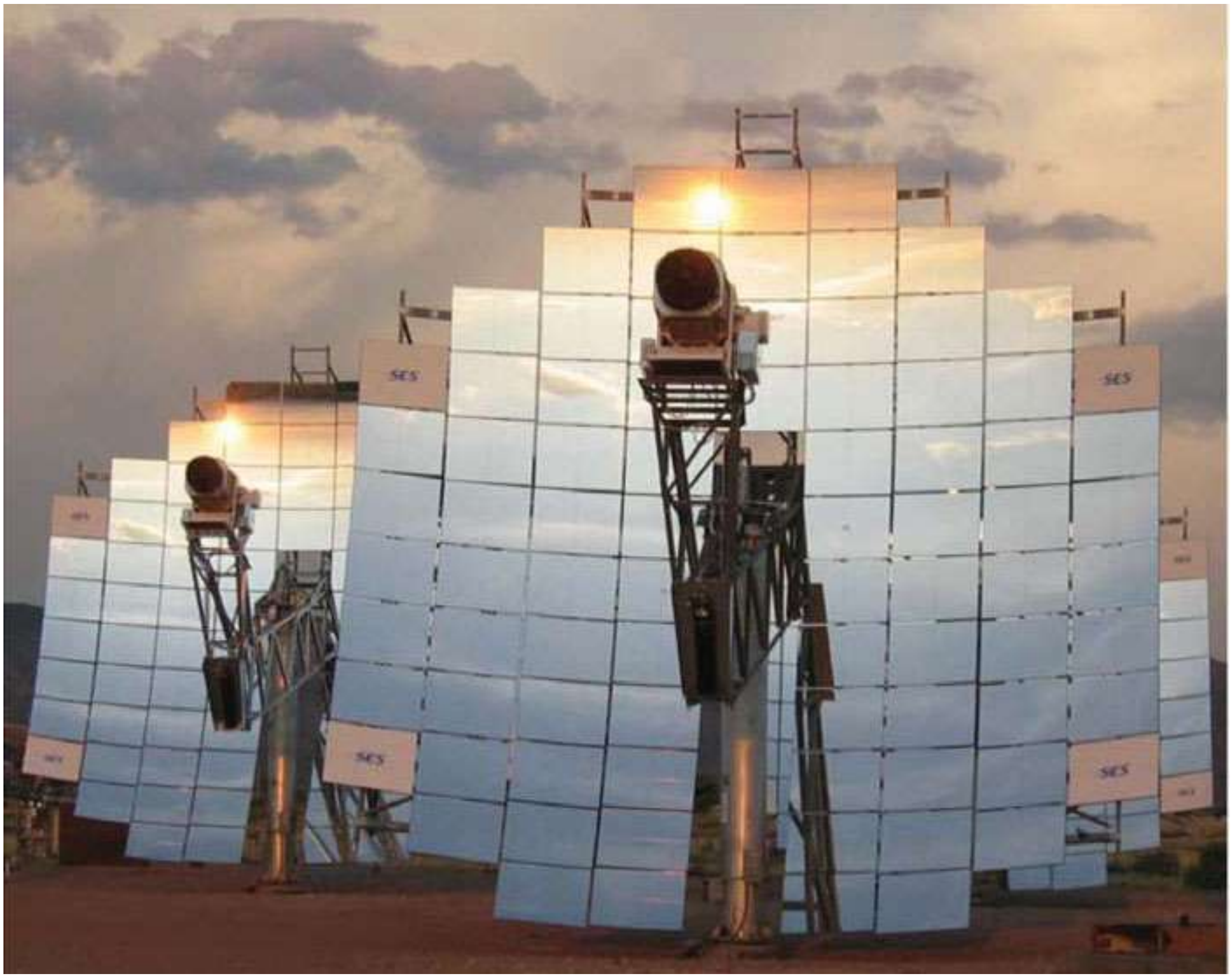
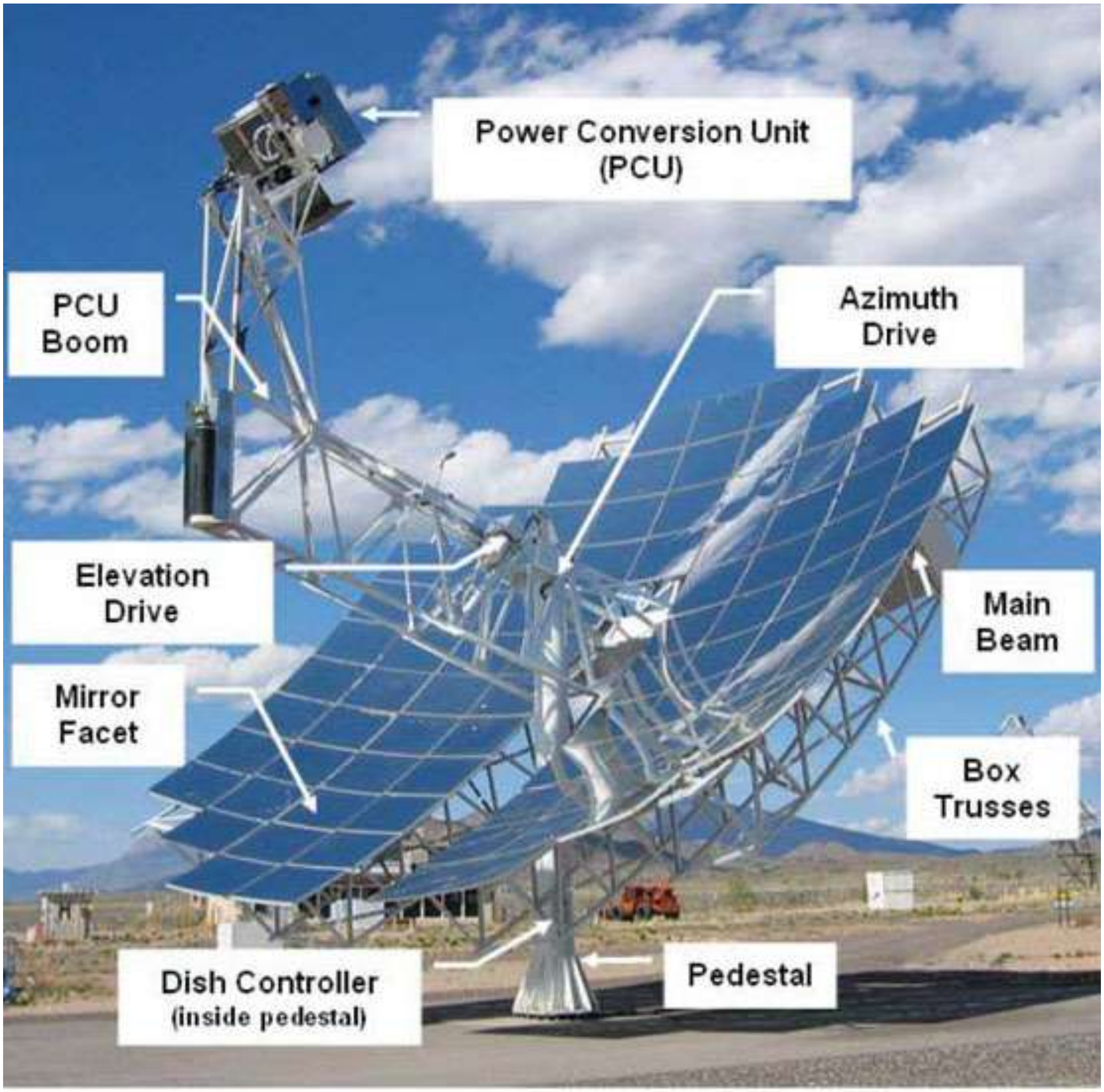
Cartographer: PAPEZ J

Photograph of SunCatcher Solar Dish Array



Illustrated Photograph of a SunCatcher Solar Dish Array



APPENDIX F: SUMMARY OF CULTURAL RESOURCES INVESTIGATIONS

The BLM, in coordination with the Energy Commission, has authorized the Applicant to conduct specific identification efforts for this undertaking including a review of the existing literature and records, cultural resources surveys, ethnographic studies, and geomorphological studies to identify historic properties that might be located within the APE.

The Applicant has retained URS Corporation to complete all of the investigations necessary to identify and evaluate cultural resources located within the Area of Potential Effect (APE) for both direct and indirect effects. URS Corporation is authorized to conduct cultural resources investigations on lands managed by the BLM under Cultural Resources Use Permits No. CA-06-01 and CA-06-11 issued by the BLM California State Office. URS is authorized to conduct specific field investigations for the Tessera Solar Imperial Valley Solar Project under BLM Fieldwork Authorization CA-670-06-07FA09 and Fieldwork Authorization CA-670-06-07FA10.

URS Corporation has completed a review of the existing historic, archaeological and ethnographic literature and records to ascertain the presence of known and recorded cultural resources in the APE, has conducted an intensive field survey for all of the lands identified in APE for direct effects for all project alternatives, and has completed intensive field surveys for alternatives on lands that are no longer part of the project. Approximately 7,700 acres of pedestrian survey to identify cultural resources within the APE has been completed. The ROW that BLM would issue encompasses approximately 6,251 acres of land, including the proposed 230-kV substation, the solar energy power plant, the Main Services Complex and associated electric and utility services, the sanitary system, access and entry roads, and corridors for the electric transmission line and the water supply pipeline. There are 360 acres of private land included within the project. As proposed, the project would encompass approximately 6,500 acres..

A draft cultural resources report (*Revised Class III Confidential Cultural Resources Technical Report, Application for Certification (08-AFC-5), SES Solar Two, LLC,* prepared by URS Cororation, December 2009) has been submitted by the Applicant that presents the results of identification efforts to the BLM, the COE, and the Energy Commission. The BLM, the COE, and the Energy Commission are currently reviewing all documentation to determine whether the report conforms with the field methodology and site description template required by BLM and the Energy Commission and is adequate to support to determinations and findings the agency's will render pursuant to section 106 of the NHPA.

URS Corporation conducted a records search at the Southeastern Information Center (SIC) in San Diego, California. The SIC searched all relevant previously recorded cultural resources site records and previous investigations completed within the project area and a 1-mile search radius around it. Information reviewed included location maps for all previously recorded trinomial and primary prehistoric and historical archaeological sites and isolates; site record forms and updates for all cultural resources previously identified; previous investigation boundaries; and National Archaeological Database citations for associated reports, historical maps, and historical addresses. The literature and records search identified 31 records related to cultural resources investigations conducted within 1-mile of the Project area. Several of these records were for prior projects which overlap the boundaries of the Imperial Valley Solar Project APE. The record search also identified approximately 400 previously recorded cultural resources within the APE and extended survey areas (Appendix F: Summary of Cultural Resources Investigations).

Between January 9, 2008 and April 5, 2008, URS conducted an intensive cultural resources survey (also referred to as a BLM Class III survey) of the APE. In 2009 additional fieldwork took place over the course of a number of separate field efforts as directed by the BLM and CEC. The additional field work was conducted to develop additional documentation for sites within the APE for the Phase 1 and Phase 2 components of the 750 MW solar energy plant. This work involved re-visiting and updating approximately 302 sites recorded in 2008. Other project-related components included in the APE were also examined during the cultural resources investigations. These included the Imperial Valley Substation, which is an existing facility. The water pipeline and transmission line corridors were also surveyed, both within the project site and off-site locations that are associated with the project.

The Class III intensive pedestrian survey of the Project APE identified 453 total cultural resources; 442 archaeological resources and 11 historic built environment resources. Of the 442 archaeological resources, 363 are archaeological sites, (237 prehistoric, 72 historic, 42 multi-component and 12 indeterminate) and 79 are isolated finds.

The following describes the data collected within the 300-MW Phase I APE. Phase I includes the 300-MW solar field, the Main Services Complex and the 750-MW substation. The 300-MW Phase I project area component contains 61 prehistoric sites, 15 historic sites, six multi-component sites, one indeterminate site and 12 isolated finds.

The 450-MW Phase II project component contains 147 prehistoric sites, 26 historic sites, 23 multi-component sites, 10 indeterminate sites and 50 isolated finds.

The solar energy power plant as originally proposed had a production capacity of 950 MW and encompassed approximately 7,700 acres. After considering the preliminary results of cultural resources investigations, the Applicant redesigned and reduced the size of the solar energy power plant to 750 MW and excluded 1,200 acres from the project area to avoid direct effects to the high concentration of archaeological sites in that area. Surveys of this excluded area located 114 cultural resource locations. Of the 114 cultural resource locations, ninety are prehistoric, nine are historic, five are multi-component, and 21 are isolated finds. Sites located in this exclusion zone include potential cremation or burial sites, which Indian Tribes have indicated through consultation hold sacred or religious values and cultural significance.

One archaeological district with previously recorded sites is located near or within the Project area and the one-mile file search buffer. The Yuha Basin Discontiguous Archaeological District is located outside of the project boundary and to the south and east of the project area and reflects prehistoric use of the area.

A second proposed district, referred to as the Lake Cahuilla High Water Mark Archaeological District, may result as a recommendation of the cultural resources investigations. The boundary of the proposed Lake Cahuilla High Water Mark Archaeological District will include sites located on and adjacent to the established shoreline of ancient Lake Cahuilla. Sites in the project area considered may be recommended for inclusion in this district based upon their potential to contribute to the knowledge of the exploitation of the prehistoric lacustrine environment.

A complete list of cultural resources that are located within the APE for direct effects is provided in Appendix H. A tabular summary of the results of cultural resources investigations follows:

Table 1: Archaeological resources within the APE.

Project Component	Prehistoric	Historic	Multi-Component	Indeterminate	Isolated Finds	Total
300 MW Area - Phase I	61	16	6	1	12	96
450 MW Area - Phase II	147	26	23	10	50	256
Access Road - 100-foot Corridor	0	4	3	0	0	7
Laydown Area	5	5	4	0	4	18
Project Boundary - 200-foot Buffer	5	2	0	1	5	13
Transmission Line - 300-foot Corridor	18	0	2	0	3	23
Water Line - 150-foot Corridor	1	19	4	0	5	29
Total	237	72	42	12	79	442

Table 2: Historic built-environment resources within the APE.

Project Component	Historic Built Environment	Total
Phase I - 300 MW Area	0	0
Phase II - 450 MW Area	0	0
Phase I - Access Road 100-foot Corridor	0	0
Phase I - Laydown Area	0	0
Phase I - Transmission Line 300-foot Corridor	0	0
Phase I - Water Line 150-foot Corridor	7	7
Half-Mile Built Environment	4	4
Total	11	11

Table 3: Cultural Resources Summary, Exclusion Area (URS, 2009)

Project Component	Prehistoric	Historic	Multi-Component	Isolated Finds	Trails	Total
Exclusion Area	69	16	5	19	2	111

In addition, URS completed an intensive historic architecture survey to account for the properties that appeared to be older than 45 years within the historic architecture APE, which extends one-half mile from the proposed project site and one-half mile on either side of its aboveground linear facilities. URS also completed a supplemental reconnaissance-level historic architectural survey for five previously recorded historic period properties recorded in 2008 as being located within a one-half-mile radius of the Solar Two Project area. The historic-period properties included canals and drains associated with the Imperial Irrigation District hydraulic irrigation system, portions of Highway 80, portions of the San Diego and Arizona Railroad, portions of U.S. Gypsum Rail-Line, and the Plaster City Gypsum Plant.

The project area is traversed by the Juan Bautista de Anza National Historic Trail corridor, which has been designated under the National Historic Trails Act. No physical evidence of the historic trail has yet been located within the APE for this project. The nearest known and recorded sites associated with the Anza Trail are two campsites, one located about 2.5 miles south of the project APE and one located about 3 miles north of the project APE.

The BLM has formally invited 13 Tribes to consult at the government-to-government level throughout the review of this project, and has on-going discussions about this project with Tribal cultural staff (Appendix I: Documentation of Tribal Consultation). Consultation with Indian Tribes, and discussions with Tribal organizations and individuals, has revealed concern about the importance and sensitivity of cultural resources within and near the project area and that they attach significance to the broader cultural landscape. Specifically, the Cocopah Indian Tribe and Kwaaymii Band of Laguna Indians have indicated that certain geological features hold significant value to the Tribe. Several Tribes have indicated that they attach sacred, religious and cultural significance to the cremations/burials that have been identified within the APE.

APPENDIX G: AGENCY FINDINGS AND DETERMINATIONS

The BLM has not rendered formal determinations of eligibility or findings of effect for the cultural resources that may be affected by this undertaking. It is the BLM's intent to render preliminary determinations of eligibility on all resources prior to the Record of Decision and prior to the release of the final EIS if feasible, and provide opportunity for consulting parties and the public to comment on the agency's determinations, prior to submitting final determinations to the State Historic Preservatoin Office (SHPO) for review and comment. Determinations that the BLM may render are based on cultural resources documentation and recommendations that are currently under review and have not necessarily been accepted or approved by the agency. For a limited number of cultural resources, primarily archaeological sites limited to their potential to yield signification information in prehistory or history, the BLM may treat those sites as eligible for the NRHP for project management purposes and either direct that additional testing be conducted for purposes of evaluation or that adverse effects to the property be resolved pursuant to the prescriptions of the HPTP.

A description of preliminary recommendations on the eligibility of cultural resources is provided in Appendix H: Cultural Resources Identified within the APE.

Effects to historic properties and the treatment of effects within the APE are generally summarized as follows. Specific treatments to resolve effects that are developed by the consulting parties to this Agreement would be stipulated in the Historic Property Treatment Plans that tier from this Agreement.

- Within the APE for direct physical effects for the Phase 1 300 MW and Phase 2 450 MW solar energy plant as proposed, there would be an adverse effect on all historic properties for which the significant values are informational and eligibility for the NRHP is limited to criterion D considerations. Though opportunities to avoid significant values may exist through fencing and project modification, or because of the specific nature of the installation of the SunCatcher solar dish, the industrial nature of the project and the intensity of the development would make long term management and protection of resources within the boundaries of the solar energy plant impractical and difficult to implement. The recommended treatment measures would likely involve recovery of the informational values through archaeological excavation and study. Additional mitigation measures, such as educational materials or public interpretation, would also be considered in the HPTP for these historic properties.
    - Based on the results of the intensive cultural resources survey for the original 950 MW solar energy plant, the Applicant, in consultation with BLM and the Energy Commission, redesigned and downscaled the proposed project, eliminating approximately one third of the eastern portion of the Project (approximately 1,200 acres) for the express purpose of avoiding direct physical impacts to archaeological sites and potential cremation/burial sites. This area is referred to as the Exclusion Area.

- Avoidance of direct physical effects is the preferred treatment measure for historic properties to which Indian Tribes attach sacred or religious significance, or for properties that have cultural significance as a traditional cultural property. The BLM would achieve this preferred treatment by conditioning the ROW grant to exclude those historic properties, or lands, from the project.

- For historic properties located in the APE for direct physical effects in linear corridors, such as the water pipeline, the transmission line, and the main access road, the preferred treatment measure is avoidance through project redesign. Transmission tower locations may be adjusted to avoid direct effects. The water pipeline would be constructed in the shoulder of the existing Evan Hewes Highway and should avoid direct physical effects to historic properties. However, the water pipeline may be realigned and the ROW adjusted to avoid historic properties that may be located in the APE. If the property cannot be avoided, the BLM would minimize or mitigate the effects through implementation of the HPTP for significant values of the resource.
- Although the Juan Bautista de Anza National Historic Trail corridor traverses the project area, no cultural resources or other manifestation of the trail has been identified within the APE.
  - Mitigation measures developed for the trail and outlined in an HPTP would provide for additional archaeological investigations and testing throughout the project area to try to define the location of the trail or whether any archaeological evidence remains.
  - Use of imaging technology to try to identify a primary path for the trail.
  - Where archaeological data recovery is used as a mitigation measure, the investigations should provide special attention to identifying artifacts or faunal remains that may have been left behind by the Anza party.
  - Coordination with mitigation measures developed in the FEIS and Energy Commission's Staff Assessment for effects to the recreation trail and viewshed, which may include installation of interpretive displays at the project site or other known trail sites outside the project area, the development of visitory overlooks, and the creation of audio/driving interpretive materials.

APPENDIX H: CULTURAL RESOURCES IDENTIFIED WITHIN THE APE

Site No.	Site Type	Cultural Context	Potential for Buried Deposits Based on Geomorphologic Information	Project Area Location
CJA-S2-001	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
CJA-S2-005	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
CJA-S2-006	Refuse Deposit, Rock Cluster	Indeterminate	Very Low	200 Foot Archaeological Buffer
CJA-S2-007	Lithic Scatter, Ceramic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
CJA-S2-008	Lithic Scatter,Ceramic Scatter, Fire-Affected Rock (Hearth Feature)	Prehistoric	Low to Moderate	Phase II - 450 MW
CJA-S2-010	Rock Alignment	Indeterminate	Very Low	Phase II - 450 MW
CJA-S2-015	Historic Refuse Deposit	Historic	Very Low	Phase II - 450 MW
CJA-S2-017	Lithic Scatter, Obsidian Artifacts	Prehistoric	Low to Moderate	Phase II - 450 MW
CA-IMP-993 (DRK-001)	Lithic Scatter, Ceramic Scatter, Fire-Affected Rock, Groundstone, Flaked Stone, Possible Cremation	Prehistoric	Moderate	Phase II - 450 MW
CA-IMP-2190 (DRK-002)	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
CA-IMP-2003 (DRK-004)	Lithic Scatter, Historic Benchmark	Multi-Component	Very Low	Phase I - 300 MW
CA-IMP-2002 (DRK-005)	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
CA-IMP-2194 / CA-IMP-2193 (DRK-009)	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
CA-IMP-2004 (DRK-010)	Lithic Scatter, Rock Cluster Features, Historic GLO Benchmark, Historic Refuse	Multi-Component	Very Low	Phase I - 300 MW
DRK-011	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
DRK-012	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW

DRK-013	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
DRK-015	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
CA-IMP-2000 (DRK-016)	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
DRK-017	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
DRK-019	Ceramic Scatter	Prehistoric	Very Low	Phase I - 300 MW
DRK-020	GLO Benchmark and bullet casing	Historic	Very Low	Phase I - 300 MW
DRK-021	GLO Benchmark	Historic	Very Low	Phase I - 300 MW
DRK-022	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
DRK-023	Lithic Scatter, Rock Cluster	Multi-Component	Very Low	Phase II - 450 MW
DRK-024	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
DRK-025	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
DRK-026	Rock Cluster	Historic	Very Low	Phase II - 450 MW
DRK-027	Lithic Scatter, Groundstone, Rock Cluster	Prehistoric	Very Low	Phase II - 450 MW
DRK-028	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
DRK-029	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
DRK-030	Historic Refuse Deposit	Historic	Very Low	Phase II - 450 MW
DRK-031	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
DRK-032	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
DRK-033	GLO Benchmark	Historic	Very Low	Phase I - 300 MW
DRK-034	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
DRK-036	GLO Benchmark, Rock Cluster	Historic	Very Low	Phase II - 450 MW
DRK-037	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
DRK-042	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
DRK-043	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
DRK-044	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
DRK-046	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
DRK-047	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
DRK-048	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
DRK-049	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW

DRK-050	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
DRK-051	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
DRK-052	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
DRK-139	Lithic Scatter	Prehistoric	Low to Moderate	Phase I - Laydown Area
DRK-140	Lithic Scatter	Prehistoric	Low to Moderate	Phase I - Laydown Area
DRK-141	Lithic Scatter, Fire-Affected Rock/Hearth	Prehistoric	Low to Moderate	Phase I - Laydown Area
DRK-143	Lithic Scatter, Groundstone	Prehistoric	Low to Moderate	Phase I - Laydown Area
DRK-146	Historic Refuse Deposits	Historic	Low to Moderate	Phase I - Laydown Area
DRK-147	Historic Refuse Deposit	Multi-Component	Low to Moderate	Phase I - Laydown Area
DRK-148	Lithic Scatter, Ceramic Scatter, Fire Affected Rock, Historic Refuse Deposit	Multi-Component	Low to Moderate	Phase I - Laydown Area
DRK-149	Historic Refuse Deposit	Historic	Low to Moderate	Phase I - Laydown Area
DRK-188	Lithic Scatter, Ceramic Scatter	Prehistoric	Low to Moderate	Phase I - Laydown Area
DRK-S2-001	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
DRK-S2-002	Rock Cluster	Indeterminate	Very Low	Phase II - 450 MW
DRK-S2-006	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
DRK-S2-007	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
DRK-S2-008	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
DRK-S2-009	Historic Refuse Deposit	Historic	Very Low	Phase II - 450 MW
DRK-S2-010	Lithic Scatter, Historic Refuse Deposit, Rock Cluster	Multi-Component	Very Low	Phase II - 450 MW
DRK-S2-011	Rock Feature	Indeterminate	Very Low	Phase II - 450 MW
DRK-S2-012	Rock Cluster	Indeterminate	Very Low	Phase II - 450 MW
DRK-S2-013	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
DRK-S2-014	Lithic Scatter, Historic Refuse Deposit	Multi-Component	Very Low	Phase II - 450 MW
DRK-S2-015	Lithic Scatter, Rock Cluster	Prehistoric	Very Low	Phase II - 450 MW
DRK-S2-018	Lithic Scatter, Ceramic Scatter, Fire Affected Rock/Hearths	Prehistoric	Moderate	Phase II - 450 MW

DRK-S2-021	Lithic Scatter, Ceramic Scatter, Fire-Affected Rock	Prehistoric	Moderate	Phase II - 450 MW
DRK-S2-022	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
DRK-S2-023	Lithic Scatter, Ceramic Scatter, Fire-Affected Rock, Flaked Stone	Prehistoric	Moderate	Phase II - 450 MW
DRK-S2-026	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
DRK-S2-027	Rock Cluster	Indeterminate	Low to Moderate	Phase II - 450 MW
DRK-S2-028	Lithic Scatter, Ceramic Scatter, Fire-Affected Rock, Historic Refuse Deposit	Multi-Component	Low to Moderate	Phase II - 450 MW
DRK-S2-029	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
DRK-S2-030	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
DRK-S2-031	Lithic Scatter, Historic Refuse Deposit	Multi-Component	Low to Moderate	Phase II - 450 MW
DRK-S2-032	Lithic Scatter, Fire-Affected Rock/Hearth, Historic Refuse Deposit	Multi-Component	Low to Moderate	Phase II - 450 MW
DRK-S2-033	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EBR-002	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
EBR-003	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
EBR-010A	Ceramic Scatter	Prehistoric	Very Low	Phase I - 300 MW
EBR-015	Historic Refuse Deposit	Historic	Low to Moderate	Phase I - Access Road
EBR-016	Historic Refuse Deposit, Rock Cluster	Historic	Low to Moderate	Phase I - Access Road
EBR-017	Lithic Scatter, Ceramic Scatter, Fire-Affected Rock/Hearth, Possible Cremation	Prehistoric	Moderate	200 Foot Archaeological Buffer
CA-IMP-4677 / CA-IMP-1426 / CA-IMP-997 / CA-IMP-995 / CA-IMP-994 / CA-IMP-2443 / CA-IMP-269 (EBR-019)	Lithic Scatter, Ceramic Scatter, Fire-Affected Rock, Flaked Stone, Animal Bone	Prehistoric	Moderate	Phase II - 450 MW
EBR-020	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
EBR-021	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
EBR-022	Lithic Scatter, Rock Cluster	Prehistoric	Very Low	Phase I - 300 MW

EBR-023	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
EBR-025	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
EBR-026	Lithic Scatter, Ceramic Scatter	Prehistoric	Very Low	Phase I - 300 MW
EBR-061	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
EBR-062	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
EBR-064	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
EBR-065	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
EBR-066	Lithic Scatter, Ceramic Scatter	Prehistoric	Very Low	Phase II - 450 MW
EBR-069	Lithic Scatter, Groundstone, Historic Refuse	Multi-Component	Very Low	Phase II - 450 MW
EBR-070	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
EBR-072	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
EBR-073	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
EBR-077	Ceramic Scatter	Prehistoric	Very Low	Phase II - 450 MW
EBR-079	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
EBR-080	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
EBR-081	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
EBR-083	Rock Cluster	Historic	Very Low	200 Foot Archaeological Buffer
EBR-084	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
EBR-085	Ceramic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EBR-086	Historic Refuse Deposit	Historic	Low to Moderate	Phase II - 450 MW
EBR-087	Historic Refuse Deposit	Historic	Very Low	Phase II - 450 MW
EBR-092	Historic Refuse Deposit, Rock Cluster	Historic	Very Low	Phase II - 450 MW
EBR-093	Lithic Scatter, Ceramic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EBR-095	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EBR-096	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EBR-097	Lithic Scatter, Ceramic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EBR-098	Lithic Scatter, Rock Cluster	Multi-Component	Low to Moderate	Phase II - 450 MW
EBR-099	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW

EBR-100	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EBR-101	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EBR-102	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EBR-103	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EBR-104	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EBR-106	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EBR-107	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EBR-108	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EBR-109	Lithic Scatter, Historic Refuse Deposit	Multi-Component	Very Low	Phase II - 450 MW
EBR-202	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EBR-204	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EBR-205	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EBR-207	Historic Refuse Deposit	Historic	Low to Moderate	Phase I - Access Road
EBR-213	Lithic Scatter, Ceramic Scatter, Fire-Affected Rock, Possible Cremation, Animal Bone, Historic Refuse Deposit	Multi-Component	Moderate	Phase II - 450 MW
EBR-218	Lithic Scatter, Ceramic Scatter, Fire-Affected Rock/Hearth	Prehistoric	Low to Moderate	200 Foot Archaeological Buffer
EBR-219	Lithic Scatter, Fire-Affected Rock/Hearth	Multi-Component	Very Low	Phase II - 450 MW
EBR-222	Lithic Scatter, Ceramic Scatter, Fire-Affected Rock	Prehistoric	Low to Moderate	Phase II - 450 MW
EBR-223	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EJK-S2-001	Rock Cluster	Indeterminate	Low to Moderate	Phase II - 450 MW
EJK-S2-002	Rock Cluster	Indeterminate	Very Low	Phase II - 450 MW
EJK-S2-003	Rock Cluster	Indeterminate	Very Low	Phase II - 450 MW
EJK-S2-004	Lithic Scatter, Fire-Affected Rock/Hearth	Prehistoric	Very Low	Phase II - 450 MW
EJK-S2-005	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EJK-S2-006	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EJK-S2-010	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW

CA-IMP-2093 (EJK-S2-011)	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EJK-S2-014	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EJK-S2-016	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
EJK-S2-017	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
HR-02	Historic Road	Historic	Very Low	Phase II - 450 MW
HR-04	Historic Road	Historic	Very Low	Phase II - 450 MW
H-06	Historic Road	Historic	Very Low	Phase I - 300 MW
JF-001	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JF-003	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JF-003A	USGLO Benchmark	Historic	Very Low	Phase I - 300 MW
JF-004	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JF-005	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JF-006	Historic Refuse, Rock Cluster	Historic	Very Low	Phase I - 300 MW
JF-008	Historic Refuse Deposit	Historic	Very Low	Phase II - 450 MW
JF-015	USGLO Benchmark	Historic	Low to Moderate	Phase II - 450 MW
JF-018	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JF-019	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
CA-IMP-4391 (JF-021)	Lithic Scatter, Ceramic Scatter, and Historic Refuse Deposit	Multi-Component	Moderate	Phase II - 450 MW
JF-030	Historic Refuse Deposit	Historic	Low to Moderate	Phase I - Laydown Area
JF-031	Historic Refuse Deposit	Historic	Low to Moderate	Phase I - Laydown Area
JF-042	Lithic Scatter, Ground Feature	Prehistoric	Very Low	Phase II - 450 MW
JF-043	Lithic Scatter, Historic Refuse Deposit	Multi-Component	Very Low	Phase II - 450 MW
JFB-004	USGLO Benchmark	Historic	Very Low	Phase I - 300 MW
JFB-009A	USGLO Benchmark	Historic	Very Low	Phase I - 300 MW
JFB-010	Lithic Scatter, Survey Benchmark	Multi-Component	Very Low	Phase I - 300 MW
JFB-011	Historic Refuse Deposit	Historic	Very Low	Phase II - 450 MW
JFB-012	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW

CA-IMP-3752 / CA-IMP-3753 / CA-IMP-8731 (JM-001)	Lithic Scatter, Ceramic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
JM-002	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
JM-003	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
JM-005	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
JM-006	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
JM-007	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
JM-008	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
CA-IMP-2083 (JM-009)	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
JM-011	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
JM-012	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
JM-017	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
JM-020	Lithic Scatter, Historic Refuse Deposit	Multi-Component	Low to Moderate	Phase II - 450 MW
JM-021	Lithic Scatter, Rock Clusters, Historic Refuse Deposit	Multi-Component	Low to Moderate	Phase II - 450 MW
JM-023	Lithic Scatter, Obsidian	Prehistoric	Low to Moderate	Phase II - 450 MW
JM-026	Lithic Scatter, Fire-Affected Rock/Hearth, Flaked Stone, Animal Bone, Historic Refuse Deposit	Multi-Component	Low to Moderate	Phase II - 450 MW
JM-027	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
JM-028	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
JM-029	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JM-030	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JM-032	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JM-033	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JM-035	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JM-036	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JM-037	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JM-038	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW

CA-IMP-4337 (JM-039)	Lithic Scatter, Historic/Modern Rock Cluster	Multi-Component	Very Low	Phase II - 450 MW
JM-041	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
JM-042	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JM-043	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JMR-004	One Core, Fire-Affected Rock (Hearth Feature)	Prehistoric	Very Low	Phase II - 450 MW
JMR-005	Lithic Scatter, Rock Cluster, Historic Refuse Deposit	Multi-Component	Very Low	Phase II - 450 MW
JMR-006	Two Prehistoric Ceramics, One Historic Nail, Historic/Modern Rock Cluster	Multi-Component	Very Low	Phase II - 450 MW
JMR-008	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JMR-009	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JMR-011	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JMR-012	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JMR-013	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JMR-014	Lithic Scatter, Rock Clusters	Prehistoric	Very Low	Phase II - 450 MW
JMR-016	Aerial Marker, Rock Cluster	Indeterminate	Very Low	Phase II - 450 MW
JMR-018	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
JMR-021	Ceramic Scatter, one Secondary Flake	Prehistoric	Low to Moderate	Phase II - 450 MW
JMR-025	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
KRM-001	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
KRM-S2-002	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
KRM-S2-003	Lithic Scatter, Fire-Affected Rock (Hearth Feature)	Prehistoric	Low to Moderate	Phase II - 450 MW
LL-002A	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
LL-018	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
LL-019	Lithic Scatter, Rock Clusters	Prehistoric	Very Low	Phase II - 450 MW
LL-020	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
LL-024	Lithic Scatter, Fire-Affected Rock (Hearth Features)	Prehistoric	Low to Moderate	200 Foot Archaeological Buffer

LL-022A	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
LL-026	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
PRM-S2-001	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
PRM-S2-003	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
PRM-S2-009	One Core, Historic Refuse Deposit	Multi-Component	Low to Moderate	Phase I - Access Road
PRM-S2-010	Lithic Scatter, Ceramic Scatter, Historic Refuse Deposit	Multi-Component	Low to Moderate	Phase I - Access Road
PRM-S2-014	Lithic Scatter, Ceramic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
PRM-S2-016	Lithic Scatter, Obsidian Biface/Projectile Point, Sleeping Circle Feature	Prehistoric	Low to Moderate	Phase II - 450 MW
PRM-S2-017	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
CA-IMP-4343 (PRM-S2-018)	Lithic Scatter, Fire-Affected Rock (Hearth Features)	Prehistoric	Low to Moderate	Phase I - Transmission Line
PRM-S2-019	Lithic Scatter, Ceramic Scatter, Fire-Affected Rock (Hearth Feature)	Prehistoric	Low to Moderate	Phase I - Transmission Line
RAN-001	USGLO Benchmark, Rock Clusters	Historic	Very Low	Phase I - 300 MW
RAN-002	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
RAN-004	Lithic Scatter, Historic/Modern Rock Clusters, Historic/Modern Metal Artifact	Multi-Component	Very Low	Phase I - 300 MW
RAN-005	USGLO Benchmark, Tobacco Can	Historic	Very Low	Phase II - 450 MW
RAN-006	Historic Refuse Deposit	Historic	Very Low	Phase II - 450 MW
RAN-007	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
RAN-008	USGLO Benchmark	Historic	Very Low	Phase II - 450 MW
RAN-009	Historic Refuse Deposit	Historic	Very Low	Phase II - 450 MW
RAN-010	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
RAN-011	Lithic Scatter, Historic Refuse Deposit	Multi-Component	Very Low	Phase II - 450 MW
RAN-012	Lithic Scatter, Ceramic Scatter, Rock Clusters, Historic/Modern Refuse Deposit	Multi-Component	Very Low	Phase II - 450 MW
RAN-013	Historic Refuse Deposit	Historic	Very Low	Phase II - 450 MW

RAN-014	Historic Refuse Deposit	Historic	Very Low	Phase II - 450 MW
RAN-015	Historic Refuse Deposit	Historic	Very Low	Phase II - 450 MW
RAN-016	USGLO Benchmark	Historic	Low to Moderate	Phase II - 450 MW
RAN-017	Lithic Scatter,Historic Refuse Deposit, Historic Structure	Multi-Component	Low to Moderate	Phase II - 450 MW
RAN-018	Aerial Marker	Historic	Low to Moderate	Phase II - 450 MW
RAN-019	Historic Refuse Deposit	Historic	Very Low	Phase II - 450 MW
RAN-020	Historic Refuse Deposit	Historic	Very Low	Phase II - 450 MW
RAN-022	Lithic Scatter, Fire-Affected Rock, Historic Refuse Deposit, Historic Structure	Multi-Component	Very Low	Phase I - 300 MW
RAN-024	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
RAN-025	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
RAN-026	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
RAN-027	Historic Refuse Deposit, Rock Alignment	Historic	Very Low	Phase I - 300 MW
RAN-028	Lithic Scatter	Prehistoric	Very Low	200 Foot Archaeological Buffer
RAN-029	Lithic Scatter	Historic	Very Low	200 Foot Archaeological Buffer
CA-IMP-2156 (RAN-030)	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
RAN-034	Lithic Scatter, Historic Refuse Deposit	Multi-Component	Very Low	Phase II - 450 MW
RAN-035	Historic Refuse Deposit	Historic	Very Low	Phase II - 450 MW
RAN-036	Lithic Scatter, Historic Rock Clusters, Historic Refuse Deposit	Multi-Component	Very Low	Phase I - 300 MW
RAN-055	Lithic Scatter, Fire-Affected Rock (Hearth Features)	Prehistoric	Very Low	Phase II - 450 MW
RAN-057	Lithic Scatter, Ceramic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
RAN-061	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
RAN-063	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
RAN-064	Rock Cluster	Indeterminate	Very Low	Phase II - 450 MW

RAN-066	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
RAN-067	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
RAN-068	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
RAN-069	Lithic Scatter, Fire-Affected Rock (Hearth Features)	Prehistoric	Very Low	Phase II - 450 MW
RAN-073	Lithic Scatter, Fire-Affected Rock (Hearth Feature)	Prehistoric	Very Low	Phase II - 450 MW
RAN-074	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
RAN-081	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
RAN-092	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
RAN-095	Lithic Scatter, Fire-Affected Rock (Hearth Feature)	Prehistoric	Very Low	Phase II - 450 MW
RAN-412C	Lithic Scatter, Ceramic Scatter	Prehistoric	Low to Moderate	Phase I - Transmission Line
RAN-412F	Lithic Scatter, Ceramic Scatter	Prehistoric	Low to Moderate	Phase I - Transmission Line
RAN-413	Lithic Scatter	Prehistoric	Low to Moderate	Phase I - Transmission Line
RAN-416	Lithic Scatter, Ceramic Scatter, Fire-Affected Rock Groundstone	Prehistoric	Low to Moderate	Phase I - Transmission Line
RAN-417	Lithic Scatter	Prehistoric	Low to Moderate	Phase I - Transmission Line
RAN-418	Lithic Scatter, Ceramic Scatter, Groundstone	Prehistoric	Low to Moderate	Phase I - Transmission Line
RAN-419	Lithic Scatter, Fire-Affected Rock (Hearth Feature)	Prehistoric	Low to Moderate	Phase I - Transmission Line
RAN-420	Lithic Scatter, Ceramic Scatter, Historic Refuse Deposit	Multi-Component	Low to Moderate	Phase I - Transmission Line
CA-IMP-4578 / CA-IMP-1007 / CA-IMP-1006 / CA-IMP-1008 / CA-IMP-8744 / CA-IMP-4348 (RAN-424)	Lithic Scatter, Ceramic Scatter, Fire-Affected Rock/Hearths, Flaked Stone tools	Prehistoric	Moderate	Phase I - Transmission Line
RAN-426	Lithic Scatter	Prehistoric	Low to Moderate	Phase I - Transmission Line
CA-IMP-4344 (RAN-428)	Lithic Scatter, Flaked Stone	Prehistoric	Low to Moderate	Phase I - Transmission Line

CA-IMP-4342 (RAN-430)	Lithic Scatter	Prehistoric	Low to Moderate	Phase I - Transmission Line
RAN-431	Lithic Scatter, Fire-Affected Rock	Prehistoric	Very Low	Phase I - Transmission Line
RAN-433	Lithic Scatter, Ceramic Scatter, Historic Refuse Scatter, Rock Cluster	Multi-Component	Very Low	Phase I - Transmission Line
RAN-434	Lithic Scatter	Prehistoric	Very Low	Phase I - Transmission Line
RANA-003	Historic Bomb Crater	Historic	Very Low	Phase I - 300 MW
RANA-004	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
RAN-S2-001	Rock Cluster	Indeterminate	Very Low	Phase I - 300 MW
T-S2-002	Trails	Historic	Very Low	Phase I - 300 MW
RAN-S2-005	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
RAN-S2-006	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
RAN-S2-010	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
RAN-S2-011H	Historic Rock Cluster and Horseshoe Fragment	Historic	Very Low	Phase I - 300 MW
RAN-S2-012H	Historic Refuse Deposit, Rock Cluster	Historic	Very Low	Phase I - 300 MW
RAN-S2-015	Lithic Scatter	Prehistoric	Very Low	200 Foot Archaeological Buffer
RAN-S2-018	Lithic Scatter, Fire-Affected Rock, Historic Refuse Deposit	Multi-Component	Low to Moderate	Phase I - Laydown Area
RAN-S2-019	Historic Refuse Deposit and one Metavolcanic Core	Multi-Component	Low to Moderate	Phase I - Laydown Area
RAN-S2-020	Historic Refuse Deposit	Historic	Low to Moderate	Phase I - Laydown Area
S2-SLY-1	Lithic Scatter, Ceramic Scatter, Historic Trash Scatter	Multi-Component	Low to Moderate	Phase I - Waterline
S2-SLY-3	Lithic Scatter, Ceramic Scatter, Historic Refuse Deposit	Multi-Component	Low to Moderate	Phase I - Waterline
S2-SLY-5	Lithic Scatter, Ceramic Scatter, Fire-Affected Rock	Prehistoric	Low to Moderate	Phase I - Waterline
S2-SLY-25	Historic Refuse Deposit	Historic	Low to Moderate	Phase I - Waterline

S2-SLY-26	Historic Refuse Deposit and "C" Block Right-of-Way Survey Marker	Historic	Low to Moderate	Phase I - Waterline
S2-SLY-27	Historic Refuse Deposit	Historic	Low to Moderate	Phase I - Waterline
S2-SLY-28	Historic Refuse Deposit and "C" Block Right-of-Way Survey Marker	Historic	Low to Moderate	Phase I - Waterline
S2-SLY-29	Lithic Scatter, One Ceramic Sherd, Historic Refuse Deposit	Multi-Component	Low to Moderate	Phase I - Waterline
S2-SLY-30	Historic Refuse Deposit	Historic	Low to Moderate	Phase I - Waterline
S2-SLY-31	Historic Refuse Deposit and two Prehistoric Artifacts	Multi-Component	Low to Moderate	Phase I - Waterline
S2-SLY-32	Historic Refuse Deposit and "C" Block Right-of-Way Survey Marker	Historic	Low to Moderate	Phase I - Waterline
S2-SLY-33	"C" Block Right-of-Way Survey Marker	Historic	Low to Moderate	Phase I - Waterline
S2-SLY-34	"C" Block Right-of-Way Survey Marker	Historic	Low to Moderate	Phase I - Waterline
S2-SLY-35	"C" Block Right-of-Way Survey Marker	Historic	Low to Moderate	Phase I - Waterline
S2-SLY-36	"C" Block Right-of-Way Survey Marker	Historic	Low to Moderate	Phase I - Waterline
S2-SLY-37	"C" Block Right-of-Way Survey Marker	Historic	Low to Moderate	Phase I - Waterline
S2-SLY-38	"C" Block Right-of-Way Survey Marker	Historic	Low to Moderate	Phase I - Waterline
S2-SLY-39	"C" Block Right-of-Way Survey Marker	Historic	Low to Moderate	Phase I - Waterline
S2-SLY-40	"C" Block Right-of-Way Survey Marker	Historic	Low to Moderate	Phase I - Waterline
S2-SLY-41	"C" Block Right-of-Way Survey Marker	Historic	Low to Moderate	Phase I - Waterline
S2-SLY-42	"C" Block Right-of-Way Survey Marker	Historic	Low to Moderate	Phase I - Waterline
S2-SLY-43	"C" Block Right-of-Way Survey Marker	Historic	Low to Moderate	Phase I - Waterline
S2-SLY-44	"C" Block Right-of-Way Survey Marker	Historic	Low to Moderate	Phase I - Waterline
S2-SLY-45	"C" Block Right-of-Way Survey Marker	Historic	Low to Moderate	Phase I - Waterline
SM-001	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
SM-002	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
SM-003	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
SM-004	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW

SM-005	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
SM-006	Lithic Scatter	Prehistoric	Very Low	Phase II - 450 MW
SM-S2-002	Rock Cluster	Prehistoric	Very Low	Phase I - 300 MW
SM-S2-003	Rock Cluster	Prehistoric	Very Low	Phase I - 300 MW
SM-S2-004	Rock Cluster	Prehistoric	Very Low	Phase I - 300 MW
SM-S2-005	Rock Cluster	Prehistoric	Very Low	Phase II - 450 MW
SM-S2-007	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
SM-S2-008	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
SM-S2-010	Rock Cluster	Historic	Very Low	Phase I - 300 MW
SM-S2-011	Lithic Scatter, Rock Cluster	Prehistoric	Very Low	Phase I - 300 MW
SM-S2-012	Lithic Scatter	Prehistoric	Very Low	Phase I - 300 MW
SM-S2-020	USGLO Benchmark	Historic	Low to Moderate	Phase II - 450 MW
SM-S2-021	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
SM-S2-031	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
SM-S2-032	Lithic Scatter	Prehistoric	Low to Moderate	Phase II - 450 MW
SM-S2-039	Lithic Scatter, Ceramic Scatter	Prehistoric	Low to Moderate	Phase I - Transmission Line
SM-S2-040	Lithic Scatter	Prehistoric	Very Low	Phase I - Transmission Line
SM-S2-041	Lithic Scatter	Prehistoric	Very Low	Phase I - Transmission Line
T-02	Trails	Prehistoric	Very Low	Phase II - 450 MW
T-03	Trails	Multi-Component	Very Low	Phase II - 450 MW
T-06	Trails	Multi-Component	Very Low	Phase I - Access Road
T-17	Trails	Prehistoric	Very Low	Phase I - 300 MW
T-18	Trails	Prehistoric	Very Low	Phase I - 300 MW
T-21A	Trails	Prehistoric	Very Low	Phase II - 450 MW
T-21B	Trails	Prehistoric	Very Low	Phase II - 450 MW
T-42	Trails	Prehistoric	Very Low	Phase I - 300 MW
T-43A	Trails	Prehistoric	Very Low	Phase I - 300 MW
T-43B	Trails	Prehistoric	Very Low	Phase I - 300 MW
T-52	Trails	Prehistoric	Very Low	Phase II - 450 MW

County Gravel Mine	Historic Gravel Mining	Historic	–	450 MW Area Phase II
Wixon Gravel	Historic Gravel Mining	Historic	–	Phase I - Access Road
Portion of San Diego and Arizona Railroad	Built Environment	Historic	–	1/2-mile architectural buffer
Portion of Westside Canal	Built Environment	Historic	–	Phase I - Waterline
Plaster City	Built Environment	Historic	–	1/2-mile architectural buffer
Portion of US Gypsum Rail Line	Built Environment	Historic	–	1/2-mile architectural buffer
CA-IMP-7886 (Highway 80)	Built Environment	Historic	–	1/2-mile architectural buffer
Dixie Drain	Built Environment	Historic	–	Phase I - Waterline
Fern Canal and Drain	Built Environment	Historic	–	Phase I - Waterline
Fig Canal	Built Environment	Historic	–	Phase I - Waterline
Forget-Me-Not Canal	Built Environment	Historic	–	Phase I - Waterline
Foxglove Canal	Built Environment	Historic	–	Phase I - Waterline
Salt Creek Drain 2	Built Environment	Historic	–	Phase I - Waterline

APPENDIX I: DOCUMENTATION OF TRIBAL CONSULTATION

Table 4: Major Tribal Consultation Events and Contacts

TRIBE	FIRST	LAST	Title/Position	BLM Letter-January 8, 2008	Tribe Letter Response	August 19, 2008 Face to Face Meeting	Tribe Letter Response	October 9, 2008 Face to Face Meeting	BLM Letter-November 11, 2008	November 12, 2008 Field Visit	Follow-up calls-11/17/08	Follow-up calls-12/12/08	Tribe Letter Response	July 10, 2009 Face to face Meeting	BLM Letter-November 6, 2009	Follow-up calls, emails-11/21/09-12/01/09	December 4, 2009 Face to Face Meeting	BLM Letter-January 15, 2010	Follow up email-3/1/10	BLM Letter-March 11, 2010	Follow up email-3/12/10	Follow up email-3/26/10	BLM Letter-March 29, 2010	Follow up email-4/15/10	Follow up email-5/3/10	Follow up email-5/13/10	Tribe Letter Response
Campo Band of Kumeyaay Indians	H. Paul	Cuero, Jr.	Chairperson	X																							
Campo Band of Kumeyaay Indians	Fidel	Hyde	EPA Director	X																							
Campo Band of Kumeyaay Indians	Michelle	LaChappa	Chairperson				X	X	X		X	X			X	X		X		X		X	X	X	X	X	
Campo Band of Kumeyaay Indians	Lisa	Gover	Tribal Administrator/EPA Director					X	X		X	X			X	X		X		X			X				
Cocopah Indian Tribe	Sherry	Cordova	Chairperson	X					X		X	X			X	X		X		X			X				
Cocopah Indian Tribe	Jill	McCormick	Cultural Resources Manager	X					X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	
Ewiiaapaayp Band of Kumeyaay Indians	Robert	Pinto, Sr.	Chairperson	X					X		X	X			X	X		X		X			X				
Ewiiaapaayp Band of Kumeyaay Indians	Will	Micklin	Executive Director	X					X		X	X			X	X		X		X		X	X	X	X	X	
Ewiiaapaayp Band of Kumeyaay Indians	Michael	Garcia	Vice-Chairman, EPA Director	X					X		X	X			X	X		X		X			X				
Ewiiaapaayp Band of Kumeyaay Indians	Jim	Robertson	Cultural Resources Coordinator														X			X		X		X	X	X	
Fort Yuma Quechan Tribe	Michael	Jackson, Sr.	President	X					X		X	X			X	X		X		X			X				
Fort Yuma Quechan Tribe	Bridget	Nash-Chrabascz	Historic Preservation Officer/Cultural Committee Coordinator	X	X	X			X		X	X		X	X	X		X		X	X	X	X	X	X	X	X
Fort Yuma Quechan Tribe-Ah-Mut Pipa Foundation	Preston	Arroweed														X	X	X	X	X	X	X	X	X	X	X	
Jamul Indian Village	Kenneth	Meza, Sr.	Chairperson															X		X			X				
Jamul Indian Village	Jesse	Pinto															X	X		X			X				
Kwaaymii Laguna Band of Mission Indians	Carmen	Lucas		X					X	X	X	X			X	X	X	X		X			X				X
La Posta Band of Kumeyaay Indians	Gwendolyn	Parada	Chairperson	X					X		X	X			X			X		X		X	X	X	X	X	
La Posta Band of Kumeyaay Indians	James	Hill	EPA Director	X																							

La Posta Band of Kumeyaay Indians	Bernice	Paipa	Environmental Coordinator/Kumeyaay Cultural Repatriation Committee													X		X		X		X	X	X	X	X	
Manzanita Band of Kumeyaay Indians	Leroy	Elliott	Chairperson	X					X		X	X			X	X		X		X			X				
Manzanita Band of Kumeyaay Indians	Keith	Adkins	Environmental Coordinator	X					X		X	X			X	X		X		X		X	X	X	X	X	
Manzanita Band of Kumeyaay Indians	Nick	Elliott	Environmental Coordinator	X					X		X	X					X	X		X			X				
San Pasqual Band of Diegueno Indians	Allen	Lawson, Jr.	Chairperson												X	X		X		X			X				
San Pasqual Band of Diegueno Indians	Dave	Toler	Councilman												X	X		X		X		X	X	X	X	X	
Santa Ysabel Band of Diegueno Indians	Johnny	Hernandez	Chairperson									X			X	X		X		X		X	X	X	X	X	
Santa Ysabel Band of Diegueno Indians	Clint	Linton	Red Tail Monitoring and Research, Inc.							X		X			X	X		X		X		X	X	X	X	X	
Santa Ysabel Band of Diegueno Indians	Ron	Christman													X			X		X			X				
Santa Ysabel Band of Diegueno Indians	Rodney	Kephart														X											
Torres-Martinez Desert Cahuilla Indians	Raymond	Torres	Chairperson	X					X			X															
Torres-Martinez Desert Cahuilla Indians	Diana	Chihuahua	Cultural Resources Coordinator						X		X	X	X														
Torres-Martinez Desert Cahuilla Indians	Alberto	Ramirez	Environmental Coordinator						X		X	X															

APPENDIX J: MONITORING AND DISCOVERY PLAN

(DRAFT FOR CONSULTATION)
MONITORING AND DISCOVERY PLAN

IMPERIAL VALLEY SOLAR PROJECT

IMPERIAL COUNTY, CALIFORNIA

Submitted to:

Bureau of Land Management

1661 South 4th Street

El Centro, CA 92243

Prepared by:

LSA Associates, Inc.

703 Palomar Airport Road Suite 260

Carlsbad, California 92011

(760) 931-5471

LSA Project No. SSQ0802

May 26, 2010

LSA

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APPENDIX

INTRODUCTION

Tessera Solar is proposing to construct the Imperial Valley Solar Project in Imperial County on lands under the jurisdiction of the Bureau of Land Management (BLM), and cultural resources have been documented in the project's area of potential effects (APE). Efforts are being made to design the project to avoid all known cultural resources eligible for listing in the National Register of Historic Places (NRHP). The following will be discussed in this Monitoring/Discovery Plan:

- The measures necessary to avoid potential impacts to recorded cultural resources, including Environmentally Sensitive Areas (ESAs)
- Professional standards
- Monitoring plan
- Discovery plan
- Avoidance/protection procedures
- Cultural resources training
- Curation

The entire surface of the APE of the proposed project has been surveyed. Multiple prehistoric and historic resources have been identified.

PROJECT description

The Imperial Valley Solar Project would construct a proposed 750-megawatt (MW) solar energy plant on approximately 6,500 acres of public lands in California administered by BLM California Desert District and the El Centro Field Office. Imperial Valley Solar would utilize existing roads and construct new roads in the project area.

Regulatory Context

The proposed project requires authorization and issuance of a right-of-way grant by the BLM. The proposed project is a federal undertaking. Therefore, compliance with 36 CFR Part 800, regulations implementing the National Historic Preservation Act (as amended), is required. As the project may have an adverse effect on historic properties (resources eligible for or listed in the NRHP), the BLM has prepared a Programmatic Agreement (PA) stipulating treatment measures that will be implemented prior to construction. The preparation of a Monitoring and Discovery Plan are stipulated in the PA.

PROFESSIONAL QUALIFICATIONS

The BLM shall ensure that all work is under the supervision of personnel meeting the *Secretary of the Interior's Standards and Guidelines* (as amended and annotated), *Professional Qualifications Standards*. The requirements are those used by the National Park Service, and have been previously published in the Code of Federal Regulations (36 CFR Part 61). The qualifications define minimum education and experience required to perform identification, evaluation, registration, and treatment activities. BLM shall obtain résumés of prospective consultants and verify credentials of supervisory personnel and staff as necessary.

Archaeology

The minimum professional qualifications for supervisory personnel in archaeology shall be a graduate degree in archaeology, anthropology, or closely related field plus the following:

- At least one year of full-time professional experience or equivalent specialized training in archaeological research, administration or management
- At least four months of supervised field and analytic experience in general North American archaeology
- Demonstrated ability to carry research to completion

In addition to these minimum qualifications, a professional in prehistoric archaeology shall have at least one year of full-time professional experience at a supervisory level in the study of archaeological resources of the prehistoric period. A professional in historic archaeology shall have at least one year of full-time professional experience at a supervisory level in the study of archaeological resources of the historic period.

DEFINITION OF RESOURCE TYPES

Below are examples of archaeological sites that might be encountered during construction or additional surveys.

Artifact Scatter

This type of site contains a light surface scatter of artifacts such as cores, bifaces, ground stone or milling tools, pottery, and debitage. Artifact scatters may represent short-term resting areas along trails or special-purpose sites. Ecofacts, such as bone and shell, are not present at sites of this type.

Prehistoric Habitation Site

This type of resource is characterized by a variety of ecofacts and artifacts and may contain bedrock milling features, suggesting that many different activities occurred, and perhaps people in the past were living at this location. Occupation may have been for a short period of time, seasonally over hundreds of years, or may represent a village site occupied throughout most of the year. When occupied for short periods of time, habitation sites are referred to as “short-term habitation sites” or “temporary camps.” When occupied by large numbers of individuals over a long period of time, habitation sites are referred to as “long-term habitation sites” or “villages.” In addition to well-defined, often deep, cultural deposits (midden), indications of habitation sites are the presence of fire hearths and burned bone, indicating that food was being prepared and cooking occurred.

Isolate

An isolate is defined as the presence of fewer than three artifacts. An isolate does not constitute a site.

Lithic Scatter

A lithic or flake scatter contains a scatter of only flaked stone tools such as cores, stone debitage, or bifaces that may have been created from one or more distinct lithic reduction episodes. If no subsurface distribution is evident, a lithic scatter is often referred to as a “sparse lithic scatter.”

Quarry

A quarry is a location where the primary activity consisted of procuring material for stone tools. Quarry sites may be extensive and involve the mining of lithic material, or the site may be an area where cobbles from outcrops were tested for suitability. Quarry sites do not usually contain ceramics, bedrock milling, or faunal material. Occasionally, areas exhibiting limited testing of locally available lithic material are referred to as lithic scatters, when they are more appropriately limited quarry areas.

Archaeosediments

Archaeosediments are sediments created by intentional or unintentional human activity (Waters 1992:33). Other terms employed are anthropogenic and anthropic soils. Archaeosediments include middens, which are a combination of chemically-altered natural sediments, accumulated organic and inorganic refuse, and sediment brought onto the site on the soles of feet and clothing (Waters 1992:33). A shell midden is the accumulation of ecofactual remains of marine shellfish collected and processed for subsistence purposes. Midden deposits can be viewed as refuse deposits that are often associated with habitation sites. In other words, people often produce trash where they camp and live. Since these deposits contain subsistence data, midden studies are important. The researcher must decide whether midden deposits are the result of food processing in preparation for transport, foraging dinner camps, or habitation-related activity.

Native American Heritage Value

It is possible that sites, features, or objects from sites may possess sacred or ceremonial value to local Native Americans. Research into each site and its constituent cultural remains will provide a basis for analysis of its potential heritage value. Interested tribes will be consulted regarding resources located within the project area (APE).

Historic

Historic sites date to after the presence of written records in an area and are greater than 45 years old. Historical archaeology sites may exhibit glass, metal, and ceramic artifacts, to name just a few. The following types of historical archaeological sites might be expected (this list is not necessarily complete or comprehensive):

- Refuse scatters: often are represented by surface scatters or piles of metal cans, bottles, etc.
- Water conveyance systems
- Railroad camps: they exhibit evidence for the preparation of meals, often obtained from metal cans.

2.0 AVOIDANCE AND PRESERVATION

Avoidance of all cultural resources is preferred and is the goal of the BLM. If cultural resources are discovered during construction and they are eligible for listing in the NRHP, implementation of a data recovery program may be necessary. If avoidance and minimization alternatives are not feasible, then data recovery through archaeological excavation may be warranted. Archaeological sites are most often determined eligible for the NRHP under Criterion 4, “potential for important information.” The important information can often be characterized by the physical data, the artifacts, and features in the ground. Archaeological excavations may recover this information. This form of mitigation is called data recovery and includes scientific analyses and the preparation of a technical report. The purpose of conducting a mitigative excavation is to recover, analyze, and document in written form the important information contained within an archaeological site. The report must meet professional standards discussed later in this plan.

As stated above, avoidance of cultural resources during construction is preferred. Whenever practicable, an archaeological site that is determined eligible for listing in the NRHP should be left in place and preserved from damage. Avoidance and minimization alternatives should be also considered as the first option for sites not evaluated. Avoidance measures may include limiting the size of the undertaking to reduce the effect, modification of the undertaking through redesign, and monitoring of ground-disturbance activities to record significant archaeological remains if they are encountered.

2.1 environmentally sensitive areas

Newly discovered and previously known prehistoric and historic archaeological sites located within project’s APE shall be designated as ESAs. Construction personnel shall be instructed how to avoid ESAs.

All construction personnel shall be trained regarding the recognition of possible buried cultural remains, including prehistoric and historic resources during construction, prior to the initiation of construction or ground-disturbing activities. BLM shall complete training for all construction personnel. Training shall inform all construction personnel of the procedures to be followed upon the discovery of archaeological materials, including Native American burials.

2.2 Plan of ESA establishment and Designation

1. The Archaeologist shall flag and/or fence the cultural resource.

2. The lead construction engineer (resident engineer [RE]) and all supervisory personnel shall be informed by the BLM archaeologist and/or its representative of the presence and location of all ESAs within the project area and the need to maintain integrity of the ESAs.
3. The BLM archaeologist and /or its representative shall convey the archaeological sensitivity of the resource to the construction personnel.
4. Construction personnel shall be informed that ESAs are strictly off-limits to construction, and entrance is not allowed at any time. ESAs shall not be described as archaeological sites. The exact location of cultural resources is confidential.
5. For prehistoric resources, the BLM archaeologist shall consult with interested Native American tribes regarding the sensitivity of the area and any new discoveries. BLM shall make a reasonable and good faith effort to address concerns. The BLM shall consider the role of Native Americans regarding supporting the monitoring of significant Native American resources within and adjacent to project impact areas.
6. Archaeological monitors shall ensure that no ground-disturbing activities take place within the boundaries of any ESA.
7. Archaeological monitors shall immediately report all violations to BLM.
8. BLM and the archaeological monitors shall observe and maintain avoidance of the ESAs. Results of this effort shall be presented in the monitoring report for the project.

If a resource cannot be avoided, then the resource would be evaluated for eligibility for listing in the NRHP.

Training

BLM shall provide a background briefing for supervisory construction personnel describing the potential for exposing cultural resources, the location of any potential ESA, and procedures to treat unexpected discoveries. An Imperial Valley Solar Project training document has been prepared and shall be provided to construction personnel in support of the on-site training described below. The training document provides prehistoric, historic and regulatory contexts, the roles of BLM and the archaeological monitors, the responsibilities and authority of the monitors, an outline of discovery protocols, and examples of artifacts. The cultural resources training shall include the following:

1. Summary of the archaeological and cultural sensitivity of the area.
2. Regulatory context and BLM protocols.
3. Project roles and responsibilities for the BLM archaeologist and the archaeological monitors.
4. Authority of archaeological monitors to halt work.
5. Basic artifact recognition.
6. The understanding that if construction personnel observe cultural material or what appears to be a cultural resource, the BLM archaeologist and/or representative shall be contacted immediately. Construction personnel shall have the requisite contact information.
7. The explicit understanding that cultural resources and human remains are not to be disturbed.
8. The procedures to follow if cultural material and human burials are observed:

- Work halts immediately.
- The location is secured and made off-limits to ground disturbing activities.
- The construction foreman and BLM archaeologist are called immediately.
- Work does not re-commence until authorized by the BLM archaeologist.

3.0 monitoring plan

3.1 Monitoring

An archaeological monitor will be present during construction. Additionally, monitoring of ground-disturbing activities within 50 feet of a known cultural resources is required. Monitors are to ensure that ESAs are properly (and adequately) marked and protected. A Native American monitor is required at all sensitive prehistoric resource locations. Safety is paramount, and all monitors shall undergo safety briefings and shall abide by all Occupational Safety & Health Administration (OSHA) and project safety requirements. Monitors have the authority to halt work. BLM shall maintain a record of the safety briefings and require that all monitors participate. The following list outlines the qualifications and responsibilities of the archaeological monitors.

1. The qualifications of monitors shall be confirmed by the BLM. The consultant shall provide résumés and references. The monitors must be familiar with the types of historic and prehistoric resources within the study area.
2. Monitors shall maintain a daily work log. The log shall include:
    a. Date and time of work
    b. Area of work
    c. Type of work and equipment present
    d. Construction activities performed
    e. Monitoring activities performed (e.g., protection of ESA)
    f. Cultural resources present
    g. Name of Native American monitor (if present)
3. Color digital photographs shall be taken, as appropriate, to document monitoring activities. All ESAs, at a minimum, shall be photographically documented prior to, during, and after construction in their vicinity. If previously unknown or inadequately documented cultural resources are encountered during monitoring, BLM and the monitors shall follow the procedures presented in the section titled *Discovery Treatment Plan*.
4. Monitors shall provide daily verbal updates to the BLM archaeologist. Written memo updates shall be provided weekly. The weekly memos shall identify the monitors present, dates worked, and their locations for that week. The memo shall present the results of monitoring for that week. Once monitoring has been completed, a monitoring report shall be drafted for review and approval by the BLM archaeologist. The monitoring report shall present the following:
    a. All monitoring activities
    b. Location of monitoring

c. Dates of monitoring

d. Personnel participating and their qualifications

e. Resources (ESAs) satisfactorily protected

f. Damaged resources, including the effects and the significance

g. Discovered resources and their significance (if any)

h. Management and treatment measures implemented

The report will be reviewed and approved by the BLM archaeologist and will be prepared per *ARMR* (OHP 1989) format guidelines.

5. Monitors shall ensure that all ESAs are avoided and protected. This includes verification that the current conditions of known significant resources do not change as part of this project. If protected sites exhibit physical changes, the protection measures are inadequate and need to be immediately changed and improved under direction from the BLM archaeologist. Earthmoving within 50 feet of a significant resource may be halted.

6. If individual artifacts are exposed during monitoring, they will be mapped in situ, collected, analyzed in the consultant's laboratory, cataloged, and curated. A curation agreement will be established with a curation facility that meets federal standards).

7. If a feature (cluster of in situ artifacts, intact hearth, foundation, etc.) is exposed during monitoring, construction activities will be diverted briefly until the project archaeologist has had the opportunity to assess the find and make appropriate recommendations. Consultant recommendations shall be provided to the BLM and in accordance with the *Discovery Treatment Plan* provided later in this document. Avoidance is preferred and, if a resource cannot be avoided, then first it must be evaluated. If the resource is significant, then avoidance must be reconsidered. If the significant resource cannot be avoided, then treatment measures (including possibly data recovery) must be implemented prior to recommencing construction. The details of this process are also discussed in the *Discovery Treatment Plan* provided later in this document. During the field implementation of archaeological studies, earthmoving within 50 feet may be halted.

   After mitigation of site impacts has been completed, and if additional cultural material is exposed by grading in the same site, additional hand-excavation will not be required unless the additional material represents a new kind of data not recovered during previous data recovery at that site. Such new data would consist of artifact classes and features not recovered during previous mitigation. Features may include hearths, refuse pits, and burials. Even if no additional hand-excavation is required, the newly exposed material will be mapped and collected.

8. If human remains are encountered, a course of action following the requirements set forth in 43 CFR 10 and the BLM Native American Graves Protection and Repatriation Act (NAGPRA) Protocols. This would include stopping work in the exclusion area for a period of no more than 30 days while the consultation requirements of NAGPRA are completed. Work on the undertaking can proceed outside of the exclusion area. Should these BLM NAGPRA protocols not be followed, a violation of NAGPRA and the Archaeological Resources Protection Act (ARPA) may take place. ARPA allows

the government to assess civil fines and to proceed with criminal prosecution depending on the nature of the violation.

4.0 DISCOVERY PLAN

4.1 Plan of Treatment of Discoveries

This Discovery Plan addresses the actions to be taken should discoveries occur during project implementation. Potential discoveries in the Imperial Valley Solar project area are divided into two categories, each requiring distinct management procedures: treatment of previously unknown artifacts, features, site components, or sites; and treatment of human remains discoveries. The procedures to be followed, should such discoveries be made during the treatment program or during project implementation, are reviewed below.

If human remains are encountered, the course of action will follow the requirements set forth in 43 CFR 10 and the BLM Native American Graves Protection and Repatriation Act (NAGPRA) Protocols. This would include stopping work in the exclusion area for a period of no more than 30 days while the consultation requirements of NAGPRA are completed. Work on the undertaking can proceed outside of the exclusion area. Should these BLM NAGPRA protocols not be followed, a violation of NAGPRA and the Archaeological Resources Protection Act (ARPA) may take place. ARPA allows the government to assess civil fines and to proceed with criminal prosecution depending on the nature of the violation.

Whereas the protocols below apply to all discoveries, specific management and treatment measures may vary according to the resource type discovered, the discovery location within the project area, and anticipated project effects. Specific field and laboratory methods are presented in Appendix A.

Management of Previously Unknown Sites, Site Components, or Features

Previously unknown artifacts, features, site components, or even sites may be encountered during archaeological monitoring. The spatial distribution of features and their functional types are important aspects of the research design, both in terms of intrasite structure and spatial organization and in the distribution of features associated with the ridgeline cultural landscape. Some potential for buried remains occurs within depositional environments present within the APE.

Recovery and documentation of cultural materials will, at minimum, include mapping the discovery location and may also include one or more of the following: photographs; illustrations of artifacts, features, or soil profiles; surface artifact collection; and test or data recovery excavations. The procedures outlined below will be adhered to should there be archaeological discoveries during construction monitoring for the project. A discussion of the disposition and curation of recovered artifacts is presented later in this in the section titled *Data Management and Curation*.

Guidelines for the treatment of new discoveries within the project area are as follows:

- The archaeological monitor shall have the authority to halt work in discovery vicinities and redirect heavy equipment away from the discovery site.
- All ground-disturbing activities that would adversely impact a newly discovered cultural resource will be halted. The horizontal and vertical limits of the resource within the impact area shall be determined. The resource shall be protected by physical barriers and the presence of monitors to ensure that further disturbance to the resource is avoided and to minimize impacts.
- The BLM shall apply the criteria for listing in the NRHP including the following:
  - (A) It is associated with events that have made a significant contribution to the broad patterns of history and cultural heritage;
  - (B) It is associated with the lives of persons important in our past;
  - (C) It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; and/or
  - (D) It has yielded, or may be likely to yield, information important in prehistory or history.
- If the cultural resource is determined by the BLM to be a historic property (eligible for the NRHP), consultation will take place to determine the appropriate treatment measures.
- BLM shall consult with Native American groups or other interested parties regarding the treatment of the find.
- As needed, a data recovery plan shall be developed by the consultant under direction and in coordination with the BLM and to recover the significant values contained by newly discovered resources. Recovered data shall be processed, analyzed, and reported concurrent with other sites addressed during the treatment program. Please refer to the specific field and laboratory methods in Appendix A.
- If individual non-diagnostic artifacts are exposed during monitoring or construction, they shall be mapped in situ. If diagnostic artifacts are exposed, they shall be mapped, collected, analyzed in our laboratory, catalogued, and curated.
- If a feature (e.g., cluster of in situ artifacts, intact hearth, or foundation) is exposed during monitoring, construction activities shall be diverted until the find can be assessed and appropriate recommendations made. If excavation is required, it shall be accomplished expediently. Features will be exposed and recovered using standard excavation techniques, with care taken to maintain the provenance of the feature as a distinct unit. The feature shall be photographed and mapped in place prior to recovery. Samples shall be recovered for special analyses (e.g., radiocarbon, macrobotanical, palynological, or faunal) as appropriate to the character of the feature. Artifacts collected will be analyzed in the consultant's laboratory, cataloged, and temporarily curated.
- A determination shall be made as to whether a new discovery is part of an existing site or a previously unknown cultural resource. Based on that determination, existing DPR forms shall be updated to

include the discovery. The potential significance of newly discovered sites or site components shall be evaluated relative to the research design.

- If a new site or significant component of a previously recorded site is discovered, construction activities will be halted in the area until an assessment of the find can be made. If it is determined that the site has the potential to yield important data that can address research questions, a sample of the site area will be hand-excavated using the standard archaeological procedures described in the Appendix A. BLM will be informed by the consultant as to the estimated time necessary for NRHP eligibility. The assessment will include mapping the locations and elevations of new discoveries. To the extent possible, boundary definition, assessment of content and integrity, and assessment of eligibility shall be accomplished with STP excavations. At minimum, such mitigation of site impacts will include recording, excavation, and reporting of major features or artifact concentrations uncovered and recovery/curation of a sample of uncovered artifacts where practicable.
- Construction activities in the discovery area shall not resume until the site treatment is completed. The consultant shall prepare a very brief report of the findings, eligibility evaluation, and propose avoidance measures and provisions to minimize impacts specific to that discovery that shall be submitted to BLM for review and concurrence. If further disturbance cannot be minimized, then it's the cultural resources contractor would provide justification and recommendations for data recovery to the BLM. If the BLM determines that disturbance is justified, then recommendations for data recovery would be reviewed by the BLM for adequacy and to evaluate the cost of treatment versus the cost of project redesign. Interested Native American community members would be consulted if the resource is contains a Native American context. Only after BLM review and approval of a site specific data recovery plan, would such excavation be performed. Data recovery would collect a representative sample of the deposits that would be destroyed.
- The discovery of human remains during project implementation requires special procedures, as discussed below.
- If additional cultural material is exposed by construction after mitigation of site impacts has been performed per the Discovery Treatment Plan, additional hand-excavation will not be required unless the material represents a new type of data. Such new data would consist of artifact classes and features not recovered in previous excavations. However, even if no additional excavation is required, the newly exposed material shall be mapped and collected.
- Discoveries and their treatment relative to the research shall be reported in the final monitoring report for the project. A separate report of findings and interpretation relative to a research design will be prepared if data recovery excavations are employed for mitigative site treatment.

MANAGEMENT AND TREATMENT OF HUMAN REMAINS

Human remains may be discovered in situ during the field excavation program, which includes the test unit excavations. Additionally, human remains may be discovered during the laboratory processing and analysis phases of the treatment program, since recovered cultural residues will be washed through the wet screening station and cultural constituents are not often visible to the excavators or screeners. Archaeological monitoring both within and outside site areas is also planned, during which isolated or disarticulated human remains may be uncovered. One of the objectives of archaeological monitoring is to identify such remains while they are still in place so they and their context can be managed in a manner that is sensitive to the Native American community or other ancestors and addresses existing regulations.

If human remains are encountered, course of action will follow the requirements set forth in 43 CFR 10 and the BLM Native American Graves Protection and Repatriation Act (NAGPRA) Protocols. This would include stopping work in the exclusion area for a period of no more than 30 days while the consultation requirements of NAGPRA are completed. Work on the undertaking can proceed outside of the exclusion area. Should these BLM NAGPRA protocols not be followed, a violation of NAGPRA and the Archaeological Resources Protection Act (ARPA) may take place. ARPA allows the government to assess civil fines and to proceed with criminal prosecution depending on the nature of the violation.

While it is hoped that human remains will not be encountered during the treatment program, the possibility exists that such a discovery can occur, and procedures are included herein to address such an event. When skeletal remains that may be human are encountered, the following steps will be taken:

- For field situations, archaeological investigations or project construction activities in the discovery area will cease, and the archaeological monitor or field archaeologist will notify the Principal Investigator and BLM.
- Human remains will be treated with respect and dignity, with care taken to limit disturbance and maintain the association of the remains with any accompanying funerary items and their physical setting. Archaeological investigations or project development work will not resume in the discovery area until the appropriate recovery and management actions have been completed.
- The specific location of the discovery will be withheld from public disclosure, as will the location of any reburial site.
- No excavation of human remains will be put on public display in any manner, nor photographed, except for the purpose of scientific documentation. No photographs of human remains will be distributed to the public or published.

For laboratory situations, where small bone or fragments may be identified as sensitive, similar notification and management procedures will be followed, and strict provenance controls will be maintained. The initial step is expert identification. The next steps include consultation with tribes, and preparation of a written plan for management of the remains.

5.0 DATA MANAGEMENT and CURATION

5.1 TECHNICAL REPORT PREPARATION AND DISSEMINATION

Reports regarding training, monitoring, consultation, evaluation, and data recovery (if necessary), will be responsive to contemporary professional standards. This will include the *Secretary of Interior's Standards for Archaeological Documentation* (OHP 1989).

A comprehensive technical report may be required that will present the results of monitoring, evaluation, and treatment programs completed in relation to the Imperial Valley Solar Project. The production and dissemination of the technical report is the final step in treatment. The consultant is responsible for technical report preparation, with BLM oversight and final document approval. The technical report and ancillary studies will also be responsive to contemporary professional standards and to the *ARMR* (OHP1989). Precise locational data may be provided in a separate appendix if it appears that its release could jeopardize archaeological sites.

The draft report(s) will contain cultural background, the results of Native American consultation, a description of the physical environment, a research design, methods and results sections, and a discussion of meaning (interpretation). Results of lab and specialized analyses will be given as well as a discussion of spatial and temporal distributions, as appropriate to the individual report. At a minimum, final technical report(s) resulting from actions pursuant to this treatment plan will be provided by BLM to the South Coastal Information Center.

5.2 CURATION IN PERPETUITY

Following completion of laboratory and analytical procedures, project collections will be prepared for permanent curation according to Smithsonian Institution guidelines and the requirements of the permanent curatorial facility. Materials to be curated include archaeological specimens and samples, site catalogs, field notes, field and analysis forms, feature and burial records, maps, plans, profile drawings, photo logs, photographic negatives, consultants' reports or special studies, and two copies of the final technical report. These materials will be curated at a facility that meets federal standards as promulgated at 36 CFR Part 79, *Curation of Federally Owned and Administered Archaeological Collections*.

Appendix A

specific field and laboratory methods

Standard archaeological field, laboratory, and analysis methods that are consistent with current scientific and regional procedures will be used for the Imperial Valley Solar Project. This appendix addresses newly discovered sites that cannot be avoided by project construction. Upon unanticipated discovery of intact cultural deposits, including features, the BLM will evaluate the resource for listing in the NRHP.

Strategies will include controlled excavations, which consist primarily of Shovel Test Pits (STPs) and 1 × 1 m Test Excavation Units (TEUs) and/or larger block exposures that are hand-excavated with strict provenance controls using shovels, trowels, picks, and other tools. Supervised mechanical excavations may also be used where appropriate as well as remote sensing surveys.

Archaeological resources are normally determined eligible under Criterion D, potential for important information. The resource must clearly demonstrate the potential and must exhibit the requisite physical integrity. The presence of diagnostic (datable) material and/or artifacts allowing the opportunity to date the site is imperative. Resources in disturbed contexts with no opportunity to be dated are often ineligible for the NRHP. If a resource is eligible and cannot be avoided by construction, BLM may decide to conduct data recovery and excavate a representative sample of the site employing the excavation strategies below.

FIELD METHODS

Surface Scrapes

Surface scrapes are employed in areas of dense vegetation and simply involve scraping the ground with a shovel in large units to expose the surface for examination.

Shovel Test Pits

STPs are preliminary tests for the presence of subsurface cultural deposits. It is expected that they will be used to delineate the boundaries of previously unknown sites, site components, or large, diffuse features, should they be discovered during archaeological fieldwork or monitoring. STPs normally measure approximately 35−40 centimeters in diameter and are excavated in incremental 20-centimeter levels. The number and distribution of STPs depend upon the size and geomorphic setting of each site. Each STP is excavated to 1 meter or to bedrock, whichever is encountered first, with the ground surface serving as reference for depth measurements. Excavated fill is reduced through ⅛-inch mesh hardware cloth, and recovered artifacts are collected and bagged by level, with reference numbers assigned and typical labeling information provided. Stockpiled dirt is returned to the STP upon completion; shovel test forms are completed for each unit. Due to the small volume of STP excavations, caution must be exercised in interpreting results. While positive findings clearly indicate the presence of subsurface remains, negative results cannot be assumed to indicate the absence of a subsurface component.

Auger Excavation

Auger excavations are used to define soil stratigraphy, to locate bedrock, or to test for the presence of cultural remains at greater depth, including potentially buried deposits. With extension handles, this procedure can accurately locate and trace soil strata at depths of several meters. Augers can be placed in the bottom of STPs or other excavation units to further test for depth of deposit when additional excavation is otherwise impossible. However, the small volume of most auger borings limits the usefulness of this procedure for mapping the absence of subsurface cultural deposits with certainty. On each site, auger tests are sequentially numbered, and recovered materials are bagged, labeled, transported, and processed in the same manner as other excavated materials. Reference log numbers are assigned to each provenance unit, and an auger form is completed. Auger test locations are plotted on the site plan views, and auger holes are covered upon completion with the dirt available from the initial screening reduction.

Test Excavation Units

Manually excavated TEUs afford larger subsurface exposures than STPs and are used to recover representative samples of subsurface artifacts with controlled depth information. In general, TEUs measure 1 square meter (1 × 1 m) to 4 square meters (2 × 2 m); however, dimensions may vary according to circumstances, and adjacent units may be excavated in various configurations to develop block exposures. For example, site depth is a determinant for defining unit size. Unit depths greater than 1.5 meters require the opening of an adjacent unit for health and safety issues as well as for facility of excavation and recording. Also, additional exploration and exposure of a feature that extends beyond the boundaries of a TEU may be necessary. Excavation proceeds by 10-centimeter arbitrary levels unless natural or cultural strata are present; then, levels are subdivided to maintain these distinctions. Contour levels are maintained by measuring depth from the existing surface. An excavation level record is completed for each level. As appropriate, other records are completed, including plan views, profiles of test units, and descriptions of features. In addition, test units are selectively photographed during excavation to show artifact and/or stratigraphic associations, profiles, features, or other data.

Test units will be numbered by a sequential designation. The highest corner of each test pit is designated the unit's datum for elevation control. This corner will be marked with a pin flag labeled with the test unit's number. Depths of units are determined by empirical site stratigraphy. In alluvial or aeolian deposits, units can range up to several meters below the surface of the site. Whenever possible, units will be excavated to bedrock, to two consecutive culturally sterile levels (20 cm), or to sediments that are clearly not of a culturally relevant age.

Hand-excavation of test units will normally be accomplished using shovels, trowels, rock bars, and picks, depending on the composition of the sediments and the nature of the cultural deposits. In feature contexts, trowels, brushes, and other small implements may be appropriate. Special methods are used in the excavation of features, including sample collections suitable for special study. Charcoal (for radiocarbon assay) is collected when present. Depending upon excavation context and research design issues, other samples that may be collected include bulk sediment for humate analysis and/or chemical analysis, pollen and/or phytolith, and flotation. Excavated soils are typically screened through ⅛-inch mesh to reduce sediment volume and bagged and tagged as previously described.

Water Screening

Water screening is a technique for screening excavated sediments if it is determined that dry screening is not productive for observing and recovering cultural material. This may be the case, for example, if the site soils contain a high clay content, are very wet, or are otherwise resistant to dry-screening reduction. It will be determined on a site-by-site basis whether water screening is necessary.

If water screening is employed, ⅛-inch mesh screen will still be used. The screen residues are first reduced as much as possible by dry screening and then placed in buckets and appropriately labeled with provenance information and a unique reference number. This reference number (bucket/bag log number, special sample number) is used to track cultural residues through the wet-screening station, where residues are washed, bagged, and organized for transfer to the archaeological laboratory. The use of the reference number system provides quality assurance of provenance controls. A log is kept so that each sample is accounted for and can be tracked.

Trenching

Where trenching is conducted, an archaeologist and/or geoarchaeologist will direct backhoe operation. The duties of this person include selecting trench locations and their dimensions, monitoring the backhoe while in operation, and examining profiles. Depths of trenches are determined by the site context. For safety, trenches deeper than 1.5 meters should be double width or shored. This is an OSHA requirement. Trench walls are photographed and profiled, and stratigraphic units are described. To facilitate accurate sketching, elevation-control stakes are placed at 20-meter intervals along the excavated portions of the trench. Trench profiles will be cleaned and examined at least every 5 meters. The depth of stratigraphic boundaries is measured from the surface, with strata boundaries extrapolated between mapping points. Standard sedimentary and soil variables are recorded for each stratum, utilizing the terminology of the "Description of Horizons" supplement of *Agricultural Handbook 18* (U.S. Department of Agriculture 1951). Such recorded variables include (1) description of contacts; (2) soil color; (3) textures; (4) boulder and gravel content; (5) large clast angularity (gravel size and larger); (6) large clast lithology; (7) soil structure, consistency, and plasticity; (8) root content and form; (9) sedimentary structure; (10) disturbance; and (11) organic content. Standard data on soils and sediments are recorded on the Soil Worksheet. As warranted, diagnostic artifacts and special samples may be collected from trench profiles. These collections will be point provenanced and assigned individual numbers.

Back dirt from the trenches will be sample screened at no less than 5-meter intervals through ⅛-inch mesh. Water screening will be conducted, if necessary. All features encountered will be exposed by hand. Features will be recorded and mapped on feature forms and photographically documented.

Each trench is marked with a wooden stake labeled with the trench designation. A master list of trenches with their locations, dimensions, and general observations is maintained, and trench locations are included on the site map. Backfilling of trenches is done by backhoe after manual excavations on a site are complete. The wooden stakes marking trench locations should be left in place for mapping.

Feature Excavation

Features will be exposed in plan view. If necessary, additional excavation units will be opened as a block. All feature components will be mapped and photographed. If appropriate, the feature will be bisected and profiled. Soil samples will be collected to allow the studies discussed below.

Geomorphology

The use of geomorphology in archaeological excavations has increased substantially over the last decade. A trained geomorphologist/geoarchaeologist will determine and discuss landform context and site formation processes, including the issue of disturbance, and will profile select trenches and excavation units. The geomorphologist will also help determine where trenches should be placed to obtain the best cross-section of the site stratigraphy.

Remote Sensing

There are several types of remote sensing techniques that are useful to locate buried features and other anomalies on archaeological sites. These techniques are noninvasive and, when used in combination with hand-excavation, can greatly increase the efficiency of the latter by indicating areas worthy of investigation.

Ground Penetrating Radar (GPR). GPR is a geophysical method that has been developed over the past 30 years for shallow, high-resolution, subsurface investigations of the earth. GPR uses high-frequency pulsed electromagnetic waves to acquire subsurface information. Energy is propagated downward into the ground and is reflected back to the surface from boundaries at which there are electrical property contrasts. GPR is a method that is commonly used for environmental, engineering, archeological, and other shallow investigations (Vendl 2003).

Resistivity Surveys. Another method, soil-resistivity survey, uses an electrical current introduced into the soil to locate anomalies. The ease or difficulty with which this current flows within the soil is then measured, and resistant areas are mapped (Grenda et al. 1998). Results are useful using this technique when the resistivity contrasts between the archaeological record and the surrounding soil matrix.

Magnetic-Field Gradient Survey. Magnetic-field gradient survey consists of mapping deviations from the uniformity of the earth's magnetic field (Grenda et al. 1998). This technique is based upon the magnetic field gradient being consistently zero, with deviations from this uniformity indicating archaeological features. Magnetic-field gradient surveys are particularly useful in detecting remnant magnetization that originates from heating the iron oxides found in most soils in features such as hearths, fire pits, and ceramic concentrations.

Mapping Methods

Point Provenance Method. The point provenance method is employed to map the locations of diagnostic artifacts, tools, and other items or significant features prior to collection or excavation, or to collect the surface of low-density sites. Collected materials are assigned sequential reference numbers by site, and the location of each is documented relative to the primary site datum. The reference number is used in preparation of the site map and in presentation of tabled data and artifact illustrations provided in the technical report.

Electronic Distance Measurer Method. The electronic distance measurer (EDM) method is typically used during testing and data-recovery programs where provenance accuracy is critical for meaningful interpretation of cultural resources. The EDM method provides precise locational data in three dimensions. Because each mapping shot records the vertical azimuth as well as distance and bearing, site topography can also be easily documented. To make maximum use of the precision afforded by this mapping technique, data are linked to AutoCAD and geographic information system (GIS) software data and downloaded or entered into an electronic mapping program for output. When the mapping data are plotted, the result is a precise scaled map.

An electronic total station is used for the EDM method, and a single primary mapping station is located in a central area of each property. Sub-data are established as needed, especially on large sites or those with diverse topography. Stations are established with a well-embedded nine-inch nail, and demarked with black-and-pink striped surveyor's flagging. Station labeling includes the station number, site number (permanent designation if available, field number if not), research organization, and date. At large properties, secondary mapping data can be established, keyed to the primary datum, and properly labeled to facilitate recordation of cultural, topographic, and other data.

A data receiver is used with the total station, and preprogramming the upload data receiver eliminates the need for extensive paper data records. Even with use of a data receiver, detailed mapping notes are maintained, and electronic data are backed up and/or downloaded on a daily basis. When the data receiver is not used or functions improperly, the horizontal azimuth, vertical azimuth, horizontal distance, UTM coordinates (if data are tied into system), and brief description (e.g., metate, biface, contour, projectile point) of each mapping shot are recorded on forms designed for this purpose.

The EDM will be used to map the locations of diagnostic artifacts, tools, features, artifact or rock clusters, site loci, disturbances to the resource's contextual integrity, important natural features, and other data appropriate to the resource or research design. During the evaluation program in the project area, the EDM method will be used to document the locations and relative elevations of trenches, controlled demolition blocks, excavation units, collection units (point provenance or grid collections), cultural and natural features, paleosurfaces, and other data as appropriate.

More than one prism can be utilized in conjunction with the EDM. For mapping large properties or landscape features, the use of two or more prisms may be preferred to maximize productive use of the EDM by limiting delays between shots. Radio communication will be maintained when the EDM mapping method is employed due to the extensive distances between the mapping station and the shot locations, which can be up to 1.6 kilometers.

Photographs and Illustrations

Photographic documentation will include color digital photographs taken throughout all phases of site treatment. Photographs can include site overviews to show the site's physiographic and environmental setting, hand and mechanical excavations in action, and features and unit wall profiles. Black-and-white 35 mm photographs will also be used to document features and wall profiles when appropriate. Photographs will be recorded on standard photographic logs identifying the frame, day, month, year, time, subject, and direction of view. Illustrative photographs will be included in the draft technical report.

Sketches or illustrations of unique features and artifacts are also beneficial in depicting details that are sometimes not evident in photographs. These techniques will be utilized as determined necessary and also included in the draft technical report.

LABORATORY METHODS

Collected artifacts will be inventoried and organized during and following fieldwork and prior to sorting and detailed attribute recording. The Reference Number Log (bucket/bag log) that is completed in the field is submitted to the laboratory with the bagged and labeled residues. The Reference Number Log is the primary inventory document and serves as the list against which artifacts and forms are crosschecked when transferred to the laboratory. Checking assures that (1) collections and data forms are present; (2) the provenance designations (e.g., site, test unit, depth) on each collection bag match those on the data forms and in the Reference Number Log; and (3) other required data sheets (e.g., feature records or special sample forms) are present, accurate, and complete. Data sheets with incomplete or unclear information and those that contradict other data sheets for the same property are returned to the crew chief for correction.

Cleaning

Prior to cataloging and analysis tasks, most artifacts and specimens will be cleaned and stabilized, either at the wet-screening station or in the laboratory. Specimens that will *not* be cleaned include (1) wood or fiber; (2) fragile/friable bone, antler, or shell; (3) selected ground stone (for possible pollen wash or immunological analysis); (4) selected lithic tools (for blood residue analysis); and (5) possible baked clay or ceramic items.

For other artifacts, adhering dirt will be removed by washing or dry brushing. Flaked stone, ground stone, and shell are typically cleaned using water. Depending upon its condition, bone may be either dry brushed or quickly immersed in water, gently brushed, and then quickly rinsed. To prevent accidental contamination between provenances, artifacts from a single provenance will be cleaned and/or stabilized at the same time, and washing should proceed one unit at a time. Once dry, individual artifacts from each provenance will be placed in clean polyethylene bags along with identification tags produced on archivally stable cardstock. Radiocarbon samples will be placed in either aluminum foil pouches or in glass vials, which will then be placed in clean polyethylene bags. Flotation, pollen, sediment, and other bulk samples will be left in double polyethylene bags until they are processed.

Sorting and Cataloging

Sorting and cataloging methods follow the requirements of the curation standards for a facility that will meet minimum federal requirements, as published at 36 CFR Part 79. The cataloging structure has been modeled on the University of California, Santa Barbara system without the code.

Recovered data are separated hierarchically into class, material, treatment, and item. Class separates artifacts and other data into such major categories as stone, ceramic, bone, shell, glass, metal, and others. The second order (material) deals only with items that are classed as stone. These are further sorted by toolstone (e.g., chalcedony, obsidian, volcanic, quartzite, or granite). Treatment indicates how the artifacts were modified and includes descriptions such as flaked, burned, cut, pecked, ground, polished, and others. The final ordering variable (item) places the artifact into a category such as debitage, biface, mano, or awl.

This information is recorded on the catalog form with the following additional data: count, weight, locus, unit coordinates, depth/level, item coordinates (if appropriate), unit size, type of collection, date collected, and the initials of the collection team. Special samples and ecological data (ecofacts) are recorded on the same catalog form, with the same information required for artifacts. Where appropriate, feature number, sampling stratum designation, soil stratum (stratigraphic) designation, and screening mesh size are also included for each catalog entry.

After the information has been recorded, an artifact is given a two-part catalog number, with each part separated by a dash. The first part of the catalog number is the site accession number; the second part is the artifact number, assigned consecutively in the order of entry. This catalog number will be inked directly onto artifacts, except for debitage and bone detritus. After assigning catalog numbers, the artifacts will be given identification tags (produced on archivally stable paper) and placed in clean polyethylene bags. Each tag will show the catalog number along with other pertinent information, such as site number and selected provenance information. Bagged artifacts are stored in six-inch square boxes, which are incorporated into the temporary boxing system. The catalog will be entered into the computerized data-management system for ease in sorting and manipulating data within and between sites.

Temporary Curation Methods

Processed artifacts will be physically organized and stored in a temporary boxing system until they can be analyzed and transferred to the designated curation facility. The temporary boxing system is set up by site, class, catalog number, and project number. After cataloging, the artifacts are placed in appropriately sized boxes. These boxes will be labeled with the box number, the catalog number of the first and last artifacts included in the box, and the item type (e.g., debitage, ground stone, bone, soil samples). Smaller boxes or plastic film canisters may be used for small or unusual artifacts that need further protection. The boxed artifacts are then placed in a 12 × 15 × 10 inch banker's box. The contents of the box are recorded on the box log, and the box receives a unique box identification number beginning with T (e.g., T-1, T-2) to denote the temporary boxing system. This system allows quick and organized access to specific items from a given site and provenance. Individual artifacts or assemblages can be retrieved using the site number, catalog, and the box log.

For a discussion of long-term curation and artifact disposition, refer to the sections titled *Data Management and Curation*.

Artifact and Ecofact Analyses Methods

Following initial processing and interim curation, artifact and sample analyses will proceed. The recovered chipped and ground stone assemblages, bone and shell artifacts, shell and faunal assemblages, and other items will be subject to a variety of morphological, functional, technological, and typological analyses as appropriate to the data class and research goals. Brief overviews of standard analysis methods are provided in the following sections.

Chipped Stone. The analysis of chipped stone items is directed toward developing classes (and types) of artifacts that are based on morphological, functional, and technological attributes.

Bifaces. Finished bifacial tools include such formal items as points, knives, and drills. The trajectory of biface reduction yields progressively smaller flakes and an objective piece that becomes thinner and takes on a planned form. The objective piece can include the original cobble/core or any detached flake modified using the bifacial strategy. At any point in the production sequence, an incomplete or broken biface can be used as a tool. Bifaces are classified according to the stage of manufacture represented. Biface reduction/production is recognized as a continuum, and the stages reflect arbitrary divisions within this continuum. Biface reduction can be performed on flakes, cobbles, or split cobbles and can result in cores, tools, and rejected items.

The following data will be recorded for analyzed bifaces: manufacturing stage; lithic material; color, condition, and portion present; overall shape; base shape; transverse cross-section; longitudinal cross-section; and maximum dimensions (length, width, and thickness). The stages of biface manufacture include the following:

- *Stage 1: Edging.* Deep and wide cortical removals originate from natural lateral surfaces. Twenty percent or more of the cortex is retained. The cross-section is irregular or blocky. The width-to-thickness ratio is greater than 3:1.
- *Stage 2: Primary Thinning.* Primary thinning includes second-row and some third-row flaking, loss of natural surface platform angles, prepared platforms, straightened edges , and the most prominent masses and ridges removed. Minimal cortex is retained by the end of Stage 2. The biface begins to form an ovate shape, but the cross-section is rectangular, trapezoidal, or very thick lenticular. The width-to-thickness ratio is less than 3:1.
- *Stage 3: Secondary Thinning.* Overlapping flake scars form opposing lateral margins, no cortex remains, and the biface assumes the desired shape. The cross-section is becoming more lenticular, and the width-to-thickness ratio is about 4:1. Often, change to soft hammer percussion techniques takes place during this stage.
- *Stage 4: Shaping to Preform Tool.* Shaping results in regular flake removals and uniform lateral edges. The cross-section is very lenticular, and optimal width-to-thickness ratios are reached (between 4:1 and 5:1). Optionally, a change to pressure flaking may be made for tool shaping.
- *Stage 5: Finishing.* The preform is finished by notching or fluting, basal grinding, or minor retouch and shaping, if necessary, accomplished through pressure flaking. Stage 5 bifaces can be further subdivided into morphological types.

- *Stage 6: Tool Maintenance and Resharpening.* Continued use of the tool results in dulled edges. Resharpening by pressure flaking reduces the size of the tool and produces a characteristic S-shaped edge cross-section.

Projectile Points. Projectile points are finished bifaces and are a morphologic variation of this chipped stone category. Points exhibit a wide range of styles that are chronologically and culturally diagnostic and are, therefore, treated in greater detail. Typological analysis of projectile points provides diagnostic artifact characteristics to the items and increases their importance for chronological, settlement, subsistence, and technological research.

Projectile points are well-shaped (although not always symmetrical) thin bifaces with uniform cross-sections, regular and non-sinuous edges, little to no cortex, and minute edge alteration and retouch. They often have a deliberately prepared haft element oriented near the center of one end. From the distal to proximal ends, attributes of points include the tip, blade, and stem, but reflect considerable morphological variability in tip form, blade edges, shoulder/barb configurations, notch location and orientation, stem shape, tang morphology, and base configuration.

The attribute stage of analysis recognizes three subclasses: “dart” points/shafted knives, “arrow” points, and indeterminate points. Points are further classified into named types (where possible). The attributes recorded for projectile points include lithic material, color, condition and portion present, blade edge form, blade shape, base shape, shoulder form, stem form, presence of serration, presence of basal notching, presence of side notching, cross-section, actual maximum dimensions (length, width, and thickness), reconstructed dimensions (length, width), length at longitudinal axis, actual width, position of maximum width, maximum blade width, basal width, maximum stem width, position of maximum stem width, shoulder height, proximal shoulder angle, distal shoulder angle, notch opening, side notch width, basal notch width, side notch depth, and basal notch depth.

Cores. This class of artifacts refers to bulky objective pieces used in the preparation of chipped stone tools. Most of these items are pieces representing a wide range of lithic reduction strategies, with the main goal oriented toward testing the quality of material or producing large serviceable flakes suitable for use or for modification into formal tools. Cores can be minimally described by core type, maximum dimensions (length, width, and thickness), lithic material, total observable flake removals, and percentage of cortex.

Cores can be separated into the following categories:

- Test blocks largely reflect the morphology of the original cobble and have a high percentage of cortex. They are characterized by a minimum amount of flaking (usually fewer than five flake scars), which was used to assess the texture and knapping quality of the stone and to determine whether vugs or impurities are present. Test blocks tend to represent rejected materials (i.e., those excluded from tool production trajectories).
- Split cobble/pebbles are the result of splitting cobbles or pebbles into half sections for further reduction. A minimum number of flake scars may be present. The specimens are not shaped and have thick, irregular cross-sections approaching plano-convex. Cortex covers over 50 percent of the dorsal surface. Some secondary flaking may occur around the perimeter of the split edge, but the modification has not substantially changed the morphology of the split sections. The edges may or may not be sinuous.
- Biface cores are virtually indistinguishable from Stage 1 and 2 bifaces, described previously.
- Unidirectional cores primarily have a single striking platform from which a series of flakes has been detached. The flake removal can reflect direct percussion or bipolar technique, but the vast majority of flakes should originate from the single platform.
- Bipolar cores resemble single platform cores, but differ in the existence of a second platform on the opposite end of the core. The orientation of flake removal is from both ends of the core along a single axis.
- Bidirectional cores are similar to bipolar cores, but differ in the location of the second striking platform. In bidirectional cores, the platforms are not in opposable locations.
- Multidirectional (also labeled amorphous or unpatterned cores) have multiple platforms and flake scar orientation that may either coincide with the ridges on the original cobble or lens geometry or utilize appropriate edge angles from previous flake scar removals. The flake scar removal patterning may appear haphazard and random.

Unifaces. Unifaces are shaped tools or incidentally shaped flakes or blades that have been retouched or display continuous modification along one or more edges of one face. Flakes with modification along different edges on alternate faces are also regarded as unifaces. Edge modification can occur on the dorsal or ventral surfaces. During analysis, unifaces will be typed according to existing morphological categories (e.g., keeled scraper, beaked scraper, or concave scraper). In addition, the following observations may be recorded for each specimen: material, color, shape, cross-section, longitudinal cross-section, condition, location of worked edge(s), maximum dimensions (length, width, and thickness), edge angle, and spine plane angle. Unifaces can be subdivided into the following subclasses:

- Formally shaped unifaces are tools with extensive retouching that has substantially modified the morphology of the tool. The retouching consists of a continuous series of flake scars knapped from the edge and extend from at least one-quarter to the entire face of the tool. The tool morphology may or may not be symmetrical, but the modification is relatively extensive and clearly patterned.

- Informally shaped unifaces are tools with incidental edge modification or retouching not substantially modifying the outline morphology of the flake. These items are regarded as expedient tools selected for their natural morphology or edge characteristics and are believed to have been used for a limited number of tasks. The shape of the original flake is largely evident. Edge modification is restricted to a series of five or more continuous flake scars along the edge. Discontinuous nicks randomly occurring along the edge are not regarded as modified flake tools.

Debitage. This category of artifacts refers to unmodified, discarded knapping residues resulting from the production and maintenance of chipped stone tools. Represented are a wide range of remains, including complete and broken flakes; shatter, chunks, and angular debris; and heat spalls and potlids from errors in heat treatment. The attributes recorded for debitage include lithic material, manufacturing stage, completeness, presence and percentage of cortex, evidence of heat treatment, and size. Debitage generally can be defined within the following six categories:

- Core flakes have definable dorsal–ventral surfaces and predominantly unfaceted platforms with steep platform–dorsal edge angles. The dorsal surface flake scar patterns may have unidirectional or multidirectional orientations. Flake cross-sections may be thick, angular, and irregular. Cortex commonly occurs on platforms and/or dorsal faces of these specimens.
- Biface flakes have definable dorsal-ventral surfaces and predominantly faceted platforms, acute platform-dorsal edge angles, and dorsal surface flake scar patterns with mostly multidirectional orientations. Flake cross-sections tend to be thin and concave-convex. Cortex does not occur on platforms and is rarely present on dorsal faces of these specimens. Biface reduction may have resulted in cores or tools.
- Unidentified flakes are flakes or flake fragments that possess insufficient characteristics to be classified as either core or biface flakes. They have definable dorsal and ventral orientations, but platforms are generally absent. This subclass is a general “catch-all” category for non-diagnostic flakes.
- Blades are a special form of long, relatively thin flakes characterized by unidirectional flake scar patterns on the dorsal face and a length to width ratio in excess of 2:1.
- Shatter, chunk, and angular debris are irregular pieces of knapping debris that do not possess sufficient morphological attributes to permit classification into a specific flake category. Most are angular and blocky without discernible platforms or dorsal/ventral surface orientations.
- Heat spalls and potlid flakes are derived from thermal damage and are morphologically distinct from knapping debitage. Heat spalls are often characterized by crazed exterior surfaces and sometimes thermally discolored lithic materials. Typically, the dorsal surface of heat spalled debris displays cortex or compression rings from previous flake removals. Potlids are plano-convex spalls, where the planar surface is the dorsal side and the convex surface is the ventral. Potlids and heat spalls are formed from different expansion/contraction of stone materials under extreme thermal conditions; they characteristically lack the compression rings of force. This type of debris is usually derived from failed attempts at heat treatment or accidental exposure to fire.

Because debitage is generally the most frequent artifact class on prehistoric sites, and because minimal additional key conclusions can be obtained using size data on numerous individual specimens, size sorting of debitage can be accomplished. Debitage analysis is also useful for determining whether heat treatment was a phase in tool-production strategies. Characteristic heat treatment attributes or damage such as differential luster and crazed surfaces will be recorded during debitage analysis.

Ground Stone. Ground stone is defined as lithic material whose shape is modified by repeated friction of stone against stone, as opposed to chipping. Ground stone is recorded using simple morphological and technological attributes based on size and shape. For ground stone specimens, lithic material, portion, shape, cross-section, number of ground surfaces, and maximum measurements (length, width, thickness, and weight) are recorded. In addition, evidence of formal shaping, rejuvenation, secondary use, and the presence and distribution of peck marks, polish, and striations can be recorded.

Common ground stone artifacts include the following:

- Milling stones or metates are large, tabular pieces of stone that exhibit flat to concave ground surfaces on one or both faces. They served as the surface against which materials were ground. They are separated into slab, block, and amorphous forms based on thickness and cross-section. Those that have rectangular cross-sections and are 6 centimeters or less in thickness are termed slab milling stones. Those with rectangular cross-sections but are greater than 6 centimeters in thickness are termed block metates. Milling stones with irregular, long cross-sections, without consideration of their thickness measurements, are termed amorphous. Surfaces may be classified as Type A (planar) or Type B (concave).
- Handstones or manos are handheld grinding stones used to mill food grains or other items against a metate. Typically, they are slabs or cobbles of a size to fit in one or two hands and exhibit a flattened, ground surface on one or more of their faces. Type 1 manos include amorphous to subrectangular handstones with no indication of intentionally shaping. Type 2 manos are those that have been shaped into a regularized form. This type is further subdivided on the basis of size into one-handed and two-handed varieties, with two-handed manos defined as those greater than 15 centimeters along their longest axis.
- Mortars are deeply concave stones in which material was ground and/or pounded. They may be either bowl or bedrock forms.
- Pestles are handheld grinding stones used to press against and into a mortar. They are typically long, cylindrical, and rounded at one or both ends.
- Discoidals/cogstones are thick circular items that served an unknown function, but are associated with the Milling Stone tradition in California archaeological contexts.

- Abrading stones show parallel striations oriented longitudinally (rather than transversely) on one or more faces. Battering may also be present.
- Pendants/gorgets are extensively ground on both surfaces and may have evidence of a biconically drilled hole.
- Unidentified ground stone are fragments that are too small to distinguish morphology or function. These have one or more ground/faceted surfaces, but the remaining portion is too small to infer artifact type.

Hammerstones. Typically, these artifacts are unmodified cobbles, initially reduced cores, or broken cores that exhibit battering on one or more edges. Three subclasses may be defined, two indicating the state of reduction of the artifact and the third indicating the degree of wear. The first subclass includes cobbles that lack signs of modification except for obvious battering at one or more points on the cobble surface. The second subclass is cores that show battering on one or more previously flaked edges. The third subclass is pecking stones: pebbles or cobbles with lighter and more localized wear, often on a pointed projection of the cobble. For these specimens, lithic material, portion, shape, cross-section, number of modified surfaces, and maximum measurements (length, width, thickness, and weight) can be recorded.

Faunal Analyses

A minimum number of individuals indexed will be developed for the vertebrate sample. The purpose of vertebrate faunal analysis is twofold: (1) to identify the variety of fauna present in the local environment over a long period of time, and (2) to identify the species of animals and birds that were included in the human diet, and their ratios diachronically. Both aspects–environmental change and subsistence base–are integral to understanding prehistoric adaptations.

Special Studies

Special studies to be completed for the treatment program, as data facilitate, include the following:

- *Radiometric Analysis.* Selected charcoal and shell samples and other remains containing carbon (e.g., organics and bone) from key contexts will be submitted for radiocarbon assay. Approximately 10 samples will be submitted to establish the chronology of paleolandscapes for the paleoenvironmental reconstruction historic context, and another 10 will be submitted to date the chronology of sites and site components should sufficient data be recovered during the treatment program.
- *Obsidian Sourcing Analyses and Hydration.* Obsidian sourcing analysis is used for providing an idea of the regional exchange system within which prehistoric site occupants operated. Obsidian hydration analysis by source is useful for assigning relative chronological ages to the sites and associated materials.
- *Flotation, Pedological, and Chemical Analyses of Sediments.* Flotation analysis of cultural features, including subsequent macrobotanical identification, as necessary, is an important aspect of the evaluation program. Data can be used to address subsistence, site function, seasonality of occupation,

internal site structure, and settlement type. Pedological and chemical analyses are useful for geomorphic studies, paleoenvironmental reconstructions, and postformation processes.

- *Ceramic Analyses.* Ceramic thin sectioning (sourcing).
- *Other Analyses and Assays.* Other types of artifact analyses and sample assays may be performed if sufficient data are recovered during the treatment program. These include but are not limited to (1) blood residue (immunological) analysis of selected lithic tools; (2) microscopic use–wear analysis of the edges of selected lithic tools; and (3) stable carbon isotope assay of bone samples from various taxa.

APPENDIX L: NAGPRA PLAN OF ACTION (DRAFT)

(DRAFT FOR CONSULTATION)
NATIVE AMERICAN GRAVES PROTECTION AND REPATRIATION ACT
PLAN OF ACTION

A WRITTEN PLAN OF ACTION FOR THE TREATMENT OF INTENTIONALLY EXCAVATED OR INADVERTENTLY DISCOVERED HUMAN REMAINS, FUNERARY OBJECTS, SACRED OBJECTS, OR OBJECTS OF CULTURAL PATRIMONY FOR THE IMPERIAL VALLEY SOLAR PROJECT IN CALIFORNIA DESERT DISTRICT OF THE BUREAU OF LAND MANAGEMENT CALIFORNIA

Draft Date: May 28, 2010

Introduction

This Plan of Action (POA) describes the procedures for the treatment and disposition of Native American human skeletal remains, funerary objects, sacred objects and objects of cultural patrimony (hereinafter, cultural items) for inadvertent discoveries during construction and of the Imperial Valley Solar Project located in California Desert District (CDD) of the Bureau of Land Management (BLM), California. This POA complies with the requirements of the Native American Graves Protection and Repatriation Act (NAGPRA), *25 U.S.C. 3001 et seq.*, its implementing regulations as set forth in *43 CFR Part 10 (specifically §10.5[e])*, and the Archaeological Resources Protection Act (ARPA), *16 U.S.C. 470aa-mm.*, with its implementing regulations (*43 CFR Part 7*).

Planned Action

The Imperial Valley Solar Project will construct a proposed 750-megawatt (MW) solar energy plant on approximately 6,500 acres of public lands in California administered by BLM CDD and the El Centro Field Office. Imperial Valley Solar would utilize existing roads and construct new roads in the project area.

Consultations

Based on previous consultation, the Campo Kumeyaay Nation, the Cocopah Indian Tribe, the Quechan Indian Tribe, the Ewiiaapaayp Band of Kumeyaay Indians, the Jamul Indian Village, the Kwaaymii Laguna Band of Indians, the La Posta Band of Kumeyaay Indians, the Manzanita Band of Kumeyaay Indians, the San Pasqual Band of Diegueno Indians, and the Santa Ysabel Band of Diegueno Indians (Tribes) have been contacted for the Imperial Valley Solar Project and have indicated the project is within ancestral territory. Additionally, sensitive areas have been identified in association with relic shorelines of ancient Lake Cahuilla. Should remains subject to NAGPRA be discovered during the course of construction, the BLM will continue to consult with the interested tribes. These groups have been consulted with and have received a copy of this plan.

BLM's duty to consult with tribes does not include any obligation, implied or expressed, to fund or pay tribes or tribal members for their participation to consult or confer with BLM.

1) Objects to be considered as cultural items:

For the purpose of this plan, the objects considered as cultural items are defined in 43 CFR10.2 (d) and include:

1. *Human remains* means the physical remains of a human body of a person of Native American ancestry. The term does not include remains or portions of remains that may reasonably be determined to have been freely given or naturally shed by the individual from whose body they were obtained, such as hair made into ropes or nets or individual teeth. For the purposes of determining cultural affiliation, human remains incorporated into a funerary object, sacred object, or object of cultural patrimony, as defined below, must be considered as part of that item (43 CFR 10.2(d)(1)).

2. *Funerary objects* means items that, as part of the death rite or ceremony of a culture, are reasonably believed to have been placed intentionally at the time of death or later with or near individual human remains. Funerary objects must be identified by a preponderance of the evidence as having been removed from a specific burial site of an individual affiliated with a particular Indian tribe or Native Hawaiian organization or as being related to specific individuals or families or to known human remains. The term burial site means any natural or prepared physical location, whether originally below, on, or above the surface of the earth, into which, as part of the death rite or ceremony of a culture, individual human remains were deposited, and includes rock cairns or pyres which do not fall within the ordinary definition of gravesite. For purposes of completing the summary requirements in §10.8 and the inventory requirements of §10.9 (43 CFR 10.2(d)(2)):

   (i) Associated funerary objects means those funerary objects for which the human remains with which they were placed intentionally are also in the possession or control of a museum or Federal agency. Associated funerary objects also means those funerary objects that were made exclusively for burial purposes or to contain human remains.

   (ii) Unassociated funerary objects means those funerary objects for which the human remains with which they were placed intentionally are not in the possession or control of a museum or Federal agency. Objects that were displayed with individual human remains as part of a death rite or ceremony of a culture and subsequently returned or distributed according to traditional custom to living descendants or other individuals are not considered unassociated funerary objects.

Typical funerary objects in prehistoric burials found in northern Nevada include, but are not limited to, arrowheads, basketry, olivella shell beads, abalone pendants, objects of deer antler or antelope horn, and incised bone objects.

3. *Sacred objects* means items that are specific ceremonial objects needed by traditional Native American religious leaders for the practice of traditional Native American religions by their present-day adherents. While many items, from ancient pottery sherds to arrowheads, might be imbued with sacredness in the eyes of an individual, these regulations are specifically limited to objects that were devoted to a traditional Native American religious ceremony or ritual and which have religious significance or function in the continued observance or renewal of such ceremony. The term traditional religious leader means a person who is recognized by members of an Indian tribe or Native Hawaiian organization as (43 CFR 10.2(d)(3)):

   (i) Being responsible for performing cultural duties relating to the ceremonial or religious traditions of that Indian tribe or Native Hawaiian organization, or

   (ii) Exercising a leadership role in an Indian tribe or Native Hawaiian organization based on the tribe or organization's cultural, ceremonial, or religious practices.

4. *Objects of cultural patrimony* means items having ongoing historical, traditional, or cultural importance central to the Indian tribe itself, rather than property owned by an individual tribal or organization member. Similar to sacred objects, objects of cultural patrimony are rarely found within archaeological sites. These objects are of such central importance that they may not be alienated, appropriated, or conveyed by an individual tribal or organization member. Such objects must have been considered inalienable by the culturally affiliated Indian tribe or Native Hawaiian organization at the time the object was separated from the group. (43 CFR 10.2(d)(4)).

2) Specific information to determine custody:

In the event of the removal of NAGPRA material on federal lands the following specific information will be used to determine custody:

1. Information provided by a lineal descendant(s) that can trace his or her direct relationship, without interruption, between themselves and the deceased by means of the traditional kinship system of the appropriate Indian tribe (43 CFR 10.2(b)) and (43 CFR 10.14(b)).

2. Information provided by a Native American tribe, people or culture that is indigenous to the United States and that can establish cultural affiliation by means of a relationship of

shared group identity which can reasonably be traced historically or prehistorically between members of a present day Indian tribe and an identifiable earlier group (25 USC 3001(9); 43 CFR 10.2(e) and 43 CFR 10.14(c)).

3. The federal agency official will determine cultural affiliation between a present-day individual or Indian tribe by a preponderance of evidence based on geographical, kinship, biological, archaeological, anthropological, linguistic, folkloric, oral traditional, historical, or other relevant information or expert opinion (25 USC 3005(7)(a)(4); 43 CFR 10.2(e); and 43 CFR 10.14(e)).

4. Priority order of custody of the cultural materials will be consistent with 43 CFR 10.6 (a) as follows:

    a. For human remains and associated funerary objects, in the lineal descendant of the deceased individual as determined pursuant to Sec. 10.14 (b);

    b. In cases where a lineal descendant cannot be ascertained or no claim is made, and with respect to unassociated funerary objects, sacred objects, and objects of cultural patrimony:

        i. In the Indian tribe on whose tribal land the cultural items were excavated;

        ii. In the Indian tribe that has the closest cultural affiliation with the cultural items as determined pursuant to Sec. 10.14 (c); or

        iii. In circumstances in which the cultural affiliation of the cultural items cannot be ascertained, the BLM is unable to prove a right of possession as defined at 43 CFR 10.10(a)(2), and the materials were excavated or removed from Federal land that is recognized by a final judgment of the Indian Claims Commission or the United States Court of Claims as the aboriginal land of an Indian tribe:

            1. In the Indian tribe aboriginally occupying the Federal land on which the cultural items were excavated, or

            2. If it can be shown by a preponderance of the evidence that a different Indian tribe has a stronger cultural relationship with the cultural items, in the Indian tribe that has the strongest demonstrated relationship with the objects.

The BLM intends to repatriate human remains and associated funerary objects when cultural affiliation can be determined.

3) Planned treatment, care, and handling of human remains:

All discovered remains shall be treated with respect and dignity. The BLM will provide the tribes an opportunity to examine remains prior to removal and to conduct traditional religious activities, if this is feasible without delay that would endanger the remains. While the BLM will provide the opportunity to view the remains prior to removal, the tribe(s) are responsible for their travel expenses to and from the location of the discovery.

The Imperial Valley Solar Project will avoid any unnecessary disturbance, physical modification or breakage of remains; or the transport, inventory or storage of human skeletal remains in locations separate from their associated funerary objects. Treatment will proceed according to the following provisions:

1. Representatives of the tribes shall have the opportunity to be present during the exposure and removal of remains whenever possible. If agreed upon by the BLM and the tribes, and if feasible, specific tribes may be designated to take the lead in initially responding to discoveries.

2. Remains will be excavated in accordance with the stipulations of the treatment plan approved under the terms of the project's Programmatic Agreement (PA) for compliance with Section 106 of the National Historic Preservation Act.

3. No destructive analyses of remains shall be permitted without the written permission from the BLM, and only after BLM has consulted with tribes regarding the planned treatment, care and handling of any recovered human remains, funerary objects, sacred objects, or objects of cultural patrimony.

4. Drawings of remains and the locations of associated funerary objects must be made, and may be published with BLM approval unless the claimants determine funerary objects are of a sensitive nature.

5. No pollen or flotation samples may be removed from burial pit fill dirt without the written permission of the BLM, and only after BLM has consulted with tribes regarding such removal.

6. Transportation of cultural items will be minimized under all circumstances and will be carefully packed to avoid disturbance or damage. Human remains may be packed separately from their associated funerary objects, but the containers will be kept together at all times.

7. Representatives of the tribes shall be afforded the opportunity to view all artifact collections and records resulting from the archaeological investigation in order to identify funerary objects, objects of cultural patrimony, or sacred objects. If such objects are

identified, the BLM will be notified by the tribes and consultation will be initiated regarding their consistency with NAGPRA criteria for identification of these classes of objects and their treatment and disposition.

8. Imperial Valley Solar is responsible for ensuring the security of cultural items from vandalism or other disturbance through employment of security personnel, fencing, and other appropriate measures as needed. If human remains are endangered by exposure or other factors, Imperial Valley Solar's approved cultural resources/archaeological contractor may be authorized by the BLM to proceed with removal of the cultural items to their laboratory facility in order to protect the cultural items. Written notice of this action must be provided to the claimants and agencies within three (3) days of removal.

9. Imperial Valley Solar will not resume construction in the buffer area surrounding the discovery until it has received written authorization to proceed based on procedures established in the treatment plans as invoked by the PA. In addition, no news releases, including but not limited to photographs, videotapes, written articles, or other means of information, shall be released by any party unless approved by the BLM and tribes.

4) Planned archaeological recording of the human remains and cultural materials:

All cultural items, as defined in this Plan, will be appropriately recorded and described using current standards and following current archaeological practices and methods. The archaeological documentation of human remains will be limited to visually evident characteristics that indicate such things as age, gender, obvious pathologies, and any obvious visual traits that may help to indicate cultural affiliation. Funerary objects will be recorded at a descriptive non-invasive level including measurements, type, and morphology. If human remains and/or cultural items are removed from the site, a catalogue of these items will be maintained.

5) Analysis planned for the human remains and cultural materials:

Initially, only non-destructive analyses will be carried out on the human remains. These can include anthropometric analyses (measurements/weight) on human remains, mapping, drawing, measuring, weighing, and photo documentation. After consultation with tribes, other tests may be determined appropriate by the BLM.

Likewise, only non-destructive analyses will be carried out initially on the associated funerary objects, unassociated funerary objects, sacred items and objects of cultural patrimony. These can include measuring and weighing, drawing, mapping, photographing, x-raying, and x-ray fluorescence analysis. After consultation with the tribes, other tests may be authorized by the BLM.

6) Steps to be followed to contact Indian tribe officials at the time of intentional excavation:

In the event of a discovery, Imperial Valley Solar's approved cultural resources contractor/permittee will notify the BLM and the appropriate land managing agency within 24 hours and may be authorized to undertake limited additional excavation and examination to assess whether the materials are within the protected classes of remains covered by the PA.

A. A verbal description of what has been found and the context in which NAGPRA items are located;
B. The location of the NAGPRA items;
C. A preliminary assessment of the type of NAGPRA items;
D. An assessment of the complexity of the burial(s), human remains, and/or other NAGPRA items, and the likelihood of disturbance if left in place;
E. Any other pertinent information.

The BLM shall notify the tribes promptly after the initial discovery of items protected under NAGPRA and provide written confirmation by certified mail, or alternatively Express Mail, of the discovery within three working days (see Attachment A and B). This information to be provided to the Tribes will include:

A. A verbal and written description of what has been found and the context in which NAGPRA items are located;
B. The location of the NAGPRA items;
C. A preliminary assessment of the type of NAGPRA items;
D. An assessment of the complexity of the burial(s), human remains, and/or other NAGPRA items, and the likelihood of disturbance if left in place;
E. A request that the tribe(s) respond within 24 hours if the tribe(s) wish to view the remains or objects in place;
F. Any other pertinent information.

The BLM will additionally afford the tribes the opportunity to conduct field visits, viewings of the items in question, and conduct appropriate and reasonable ceremonies or rituals related to the items in question. The tribes are responsible for any costs to and from the discovery site.

7) Kind of traditional treatment to be afforded the human remains:

Tribes will be afforded the opportunity to examine the remains prior to and during removal unless the remains are in direct danger of further disturbance or destruction. Tribal representatives will be afforded the opportunity to perform traditional treatments as needed to the remains.

8) Nature of reports to be prepared:

A comprehensive report on the results of the archaeological investigation, including the recovery of cultural items, will be prepared and distributed in accordance with the terms of the aforementioned PA, developed in accordance with Section 106 of the National Historic Preservation Act.

9) Planned disposition of human remains pursuant to 43 CFR 10.6:

In the event that discovered NAGPRA items must be removed, then the BLM will determine, pursuant to 43 CFR 10.6, which Native American tribe will receive custody of the items. The BLM intends to repatriate human remains and associated funerary objects when cultural affiliation can be determined. The BLM shall provide notification of intent to transfer possession and subsequently return the items to the appropriate tribe within the limitations of 43 CFR 10.15.

Upon determination of a lineal descendant(s) or culturally affiliated tribe that, under federal regulations appear to be entitled to custody of the human remains, the agency official will transfer custody of the deceased to that lineal descendant or culturally affiliated tribe in accordance with 43 CFR 10.6(c).

Prior to any such disposition, the agency official will publish a general notice of the proposed disposition in three (3) separate newspapers of general circulation in the areas where interested tribes now reside. The notices will be published at least two (2) times at least a week a part, and the transfer will not take place until at least thirty (30) days after publication of the second notice to allow time for any additional claimants to come forward.

If additional claimants do come forward and the agency official cannot clearly determine which claimant is entitled to custody, the agency official will not transfer custody of the deceased until such time as the proper recipient is determined pursuant to regulations found at 43 CFR 10.

In the event the remains are of Native American descent, but are not claimed by any tribe within the geographical area, they will not leave the custody of the federal agency. Should custody of remains be transferred to claimant tribes under 10.6, the tribes may request reburial on BLM land. Reburial of NAGPRA items on lands administered by the BLM is subject to the provisions found in Instructional Memorandum No. 2007-002. The reburial locations will be determined through consultation with the tribes and any locational information will be kept confidential to the extent allowed by law.

10) The Role of Tribal Monitors During Survey and Excavation:

Individuals who are approved tribal monitors on the project may notify the Principal Investigator(s) of items they feel are funerary objects, sacred and/or objects of cultural patrimony. The Principal Investigator will notify the BLM within 24 hours that monitors have identified funerary objects, sacred, and/or objects of cultural patrimony. The report should include a description of the find(s), photograph(s) or drawing(s) were applicable, artifact(s) numbers or identification were applicable, and a description of the tribal monitor's opinion(s).

12) BLM personnel and Tribal representatives involved in this NAGPRA effort

As a result of tribal consultation, the following individuals have been identified that will be involved in this NAGPRA effort:

Campo Kumeyaay Nation, the Cocopah Indian Tribe, the Quechan Indian Tribe, the Ewiiaapaayp Band of Kumeyaay Indians, the Jamul Indian Village, the Kwaaymii Laguna Band of Indians, the La Posta Band of Kumeyaay Indians, the Manzanita Band of Kumeyaay Indians, the San Pasqual Band of Diegueno Indians, and the Santa Ysabel Band of Diegueno Indians (Tribes), and the Ah-Mut Pipa Foundation and Kumeyaay Cultural Repatriation Committee (Tribal Organizations)

The names and addresses of the tribal members are in attachment B.

Federal Officials

____

xxx, California State Director, Bureau of Land Management Date

____

xxx, California Desert District Manager, Bureau of Land Management Date

Invited Signatories

Date

Date

Date

Date

Date

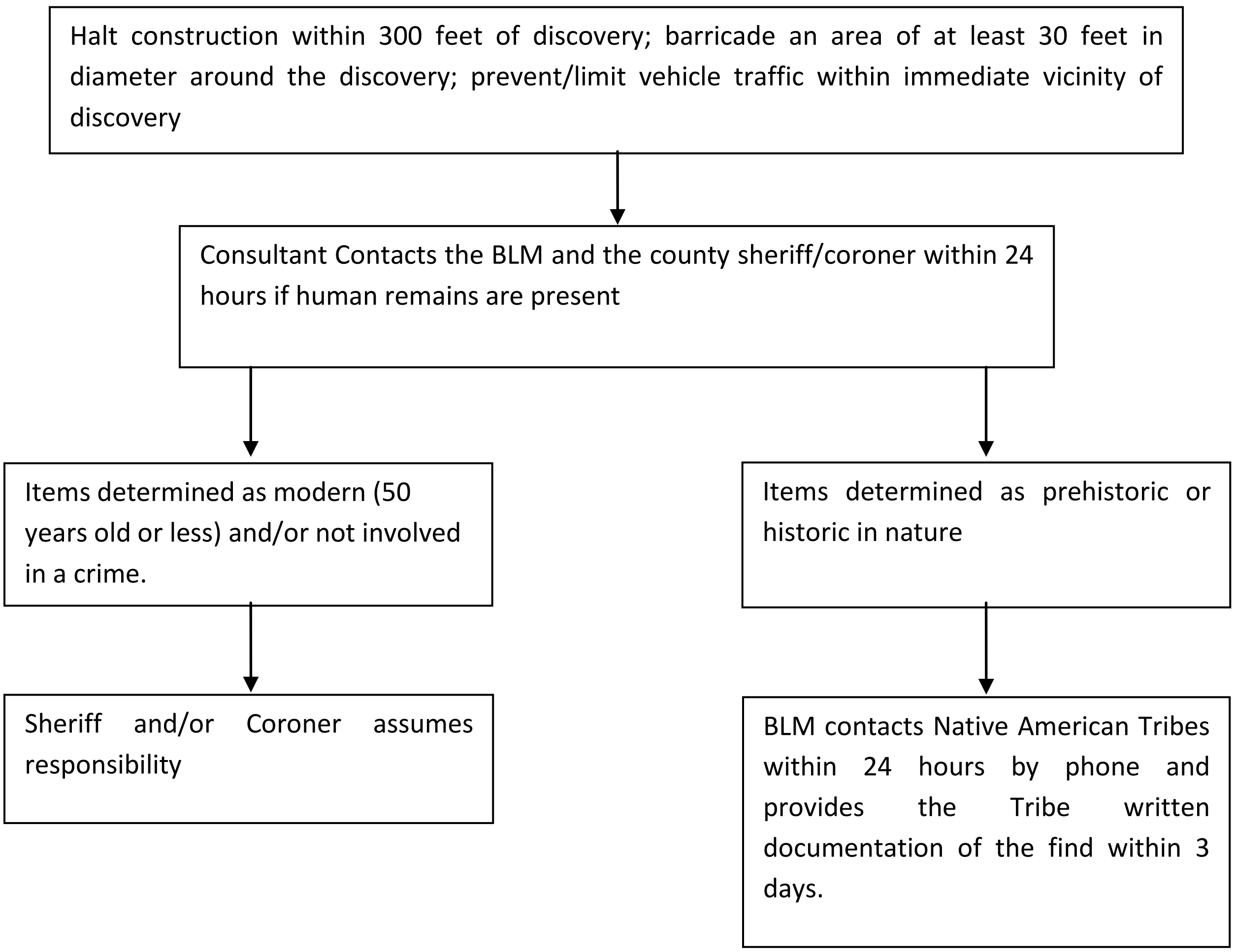
Date

Date

Date

Attachment A

Upon The Discovery of Human Remains, Funerary Objects, Sacred Objects, Object of Cultural Patrimony



Attachment B

List of Native American Tribal Contacts

F. LIST OF PREPARERS

IMPERIAL VALLEY SOLAR PROJECT
08-AFC-5
LIST OF PREPARERS

Executive Summary .... Christopher Meyer

Cultural Resources.. Michael D. McGuirt

Project Assistant .... Maria Santourdjian

G. WITNESS QUALIFICATIONS AND DECLARATIONS

DECLARATION OF
Michael D. McGuirt

I, **Michael D. McGuirt**, declare as follows:

1. I am presently employed by The California Energy Commission in the **Siting, Transmission, and Environmental Protection Division** as a **Planner II**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Cultural Resources,** for the Imperial Valley Solar Project, based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: July 27, 2010 Signed: **[Original Signed]**

At: Sacramento, California

Michael D. McGuirt, MA, RPA

15310 Abierto Drive ◦ Rancho Murieta, California ◦ 95683-9192 ◦ 916.354.1345 ◦ mikeandbeate@netzero.net

Objective

To participate in the consultations that guide the management of heritage resources in native, public, and private trusts, to foster public support for heritage resource conservation through archaeological research and public outreach, and to contribute to the formulation of historic preservation policy.

Education

Master of Arts in Anthropology ◦ The University of Texas at Austin May 1996

Area concentration in the North American Southwest. Technical concentrations in geoarchaeology, palynology, and ceramic analysis.

Bachelor of Arts in Anthropology and Archaeological Studies ◦ The University of Texas at Austin December 1990

Area concentrations in Mesoamerica and the Andes. Technical concentration in lithic analysis.

Professional Employment

Energy Planner II ◦ California Energy Commission, Sacramento, California November 2007 to November 2008

Develop environmental impact analyses of the potential effects that the construction and operation of proposed thermal power plants may have on significant cultural resources. Apply applicable Federal, State, and local statutes and regulations, as they relate to the consideration of cultural resources. Design and execute cultural resource impact analyses that are appropriate to the specific regulatory context for each proposed project. Gather and evaluate information on projects and on cultural resources in project areas. Develop and maintain agency and public relationships to acquire the most useful data and to elicit input in the development of California Energy Commission conditions of certification. Succinctly convey, orally in different public forums and in different written technical formats, the results of cultural resource impact analyses and proposed conditions of certifications meant to mitigate adverse impacts to significant cultural resources. Periodic reviews of licensees' actions to ensure compliance with extant conditions of certification. Oversight of consultants' who are preparing cultural resource impact analyses preservation program.

Senior State Archaeologist ◦ Office of Historic Preservation, California Department of Parks and Recreation (California State Parks), Sacramento, California December 2004 to December 2005

Out-of-class assignment supervising the Project Review Unit for the California State Historic Preservation Officer (SHPO) in the California Office of Historic Preservation (OHP). As the Acting Chief of Project Review, I managed and trained a staff of eight professionals and one clerical assistant to conduct, on behalf of the SHPO, the review of all Federal agency actions in the State of California under 36 CFR Part 800. 36 CFR Part 800 is the Advisory Council on Historic Preservation's implementing regulation for Section 106 of the National Historic Preservation Act of 1966, and the primary Federal historic preservation program.

Associate State Archaeologist ◦ Office of Historic Preservation, California Department of Parks and Recreation (California State Parks), Sacramento, California May 2001 to November 2007

Project Review Unit archaeologist for the California State Historic Preservation Officer (SHPO). Consulted under 36 CFR Part 800 on the adequacy of federal agency efforts to comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. 470f). Served as SHPO contact person

for informal federal agency consultation and formal initiation of Section 106 consultation (36 CFR § 800.3). Reviewed documentation of and provide comment on federal agency determinations and findings (36 CFR §§ 800.4 and 800.5). Negotiated, drafted, and reviewed memoranda of agreement and treatment plans to resolve adverse effects to historic properties (36 CFR § 800.6). Negotiated, drafted, and reviewed program alternatives and management plans (36 CFR § 800.14). Administered federal agency efforts to comply with previously executed agreement documents. Developed and delivered public and professional presentations and workshops on the Section 106 regulatory process in California and the role of the SHPO in Section 106 consultation. Helped create initiatives through the National Park Service's Certified Local Government (CLG) program to encourage the development of local community archaeological site preservation plans. Evaluated and recommended proposals for CLG grants and helped administer resultant grants. Reviewed and provided comment on National Register of Historic Places (National Register) property nominations, and prepared and presented staff reports on the nominations to the State Historical Resources Commission. Member of committee to revise the Comprehensive Statewide Historic Preservation Plan for California, and author of the archaeology section of the plan. The Office of Historic
Preservation's (OHP) liaison to the Society for California Archaeology (June 2002 to August 2010).

ARCHAEOLOGICAL CONSULTANT ∘ Kaniakapūpū Project, O`ahu, Hawai`i ∘ Department of Anthropology, University of Hawai`i at Mānoa, Honolulu, Hawai`i June 2000

Recorded exposed architectural elements and directed test excavations to reconstruct building sequences of Native Hawaiian stone architecture. Advised on the interpretation of archaeological stratigraphy and on the field application of archaeological mapping methods and techniques.

ENVIRONMENTAL SPECIALIST III ∘ Jones & Stokes, Sacramento, California February 1999 to May 2001

Designed, conducted, and managed short- and long-term archaeological projects in California, Nevada, and New Mexico to comply with Sections 106 and 110 of the NHPA. Prepared proposals. Assisted with client contract negotiations. Conducted archaeological record searches and archival research. Directed Phase I pedestrian inventory surveys and test excavations for Phase II evaluations. Analyzed material culture assemblages. Prepared technical reports and regulatory compliance documents including National Register property and district evaluations, and monitoring and discovery plans. Represented clients in consultations with federal and state agencies, and coordinated and managed clients' compliance with federal cultural resource regulations and the cultural resource regulations of California, Nevada, and New Mexico.

ARCHAEOLOGICAL TECHNICIAN ∘ B.O.A.S., Inc., Seattle, Washington August 1998 to October 1998

Assisted with data recovery excavations on a short-term cultural resource management contract.

ASSISTANT ANTHROPOLOGIST ∘ Bernice Pauahi Bishop Museum, Honolulu, Hawai`i August 1996 to June 1998

Assisted with archaeological project design, preparation of proposals, and client contract negotiations, directed Phase I pedestrian inventory surveys, test excavations for Phase I subsurface inventory surveys, test excavations for property evaluations, and data recovery excavations, and assisted with preparation of technical reports on short-term cultural resource management contracts. Analyzed field records, prepared site reports and synthetic report chapters, and analyzed and prepared reports on lithic assemblages for Phases I–III of a long-term federal highway project (Interstate Route H–3). Conducted research in Hawaiian archaeology, and delivered public and professional presentations of that research. Advised on the integration of geoarchaeological methods and techniques into cultural resource management field efforts, and on geoarchaeological interpretations of extant field records, and designed and conducted geoarchaeological components of fieldwork for short–term cultural resource management contracts.

FIELD DIRECTOR ∘ Chersonesos Project, Ukraine, Eastern Europe ∘ Institute of Classical Archaeology, University of Texas at Austin, Austin, Texas May 1996 to July 1996

Assisted in archaeological project design. Directed a geoarchaeological reconnaissance, a pedestrian inventory survey, archaeological mapping, test excavations, and data recovery excavations in the National Preserve of Tauric Chersonesos. Conducted on-site project presentations for the United States Ambassador to Ukraine, and Ukrainian and Russian archaeological scholars. Assisted in the preparation and implementation of archaeological site preservation plans. Taught archaeological field methods and techniques to graduate students. Prepared portion of requisite field report for Crimean Archaeological Council, Simferopol.

ASSISTANT FIELD DIRECTOR ∘ Chersonesos Project, Ukraine, Eastern Europe ∘ Institute of Classical Archaeology, University of Texas at Austin, Austin, Texas May 1995 to July 1995

Assisted in the direction of data recovery excavations in the National Preserve of Tauric Chersonesos. Taught archaeological field methods and techniques to graduate students. Advised on the interpretation of archaeological stratigraphy.

ARCHEOLOGIST I ∘ Archeology Survey Team ∘ Texas Parks and Wildlife Department, Austin, Texas December 1994 to May 1995

Assisted in the direction of pedestrian inventory surveys, the preparation of cultural resource management plans, and the preparation of state site forms and reports of investigations. Advised on the integration of
global positioning system (GPS) technology and the field methods of archaeological survey.

RESEARCH ASSISTANT ∘ Colha Project, Belize, Central America ∘ Department of Anthropology, University of Texas at Austin, Austin, Texas July 1994 to August 1994

Conducted an extensive ground survey to correct the published base map for the Maya site of Colha. Assisted in mapping of surface architectural ruins. Directed a test excavation crew. Assisted in the preparation of the field report.

ARCHAEOLOGIST ∘ Lower Colorado River Authority, Austin, Texas February 1994 to December 1994

Designed and implemented trial mitigation plans for archaeological sites threatened by fluvial and lacustrine erosion. Assisted in pedestrian inventory surveys and test excavations, the preparation of state site forms, the development of the agency's database of its archaeological site inventory, and public education initiatives that included site tours for primary and secondary students, and workshops for primary and secondary teachers.

COLLEGIATE EXPERIENCE

TEACHING ASSISTANT ∘ Archaeological Analysis ∘ Department of Anthropology, University of Texas at Austin, Austin, Texas August 1993 to December 1993

Presented undergraduate lectures on archaeological method and theory. Wrote and graded examinations. Advised students.

TEACHING ASSISTANT ∘ Archaeological Field School, New Mexico ∘ Department of Anthropology, University of Texas at Austin, Austin, Texas May 1993 to July 1993

Taught archaeological field methods and techniques to undergraduate and graduate students.

PROJECT ARCHAEOLOGIST ◦ WS Ranch Project, New Mexico ◦ Department of Anthropology, University of Texas at Austin, Austin, Texas May 1992 to July 1992, May 1993 to July 1993

Designed and prepared proposals for two field seasons. Addressed New Mexico State Historic Preservation Office and United States Forest Service comments on the proposals. Directed test excavations and data recovery excavations for two field seasons. Conducted geoarchaeological, palynological, and material culture analyses. Prepared a report of the research.

VOLUNTEER LITHIC ANALYST ◦ WS Ranch Project, New Mexico ◦ Department of Anthropology, University of Texas at Austin September 1991 to December 1991

Analyzed lithic tool collections from San Francisco and Three Circle phase Mogollon sites on the Gila National Forest.

VOLUNTEER ARCHAEOLOGICAL TECHNICIAN ◦ WS Ranch Project, New Mexico ◦ Department of Anthropology, University of Texas at Austin June 1991

Assisted in test excavations for the Phase II evaluations of San Francisco and Three Circle phase Mogollon sites on the Gila National Forest in advance of the development of an interpretative trail.

VOLUNTEER LITHIC ANALYST ◦ WS Ranch Project, New Mexico ◦ Department of Anthropology, University of Texas at Austin September 1990 to December 1990

Analyzed a lithic tool collection from a Three Circle to Tularosa phase Mogollon site on the Gila National Forest and submitted a report of the analysis.

ARCHAEOLOGICAL TECHNICIAN ◦ Archaeological Research, Inc., Austin, Texas July 1990

Assisted in a Phase I pedestrian inventory survey on the Sitgreaves National Forest, Arizona in advance of a timber sale.

ARCHAEOLOGICAL TECHNICIAN ◦ New World Consultants, Inc., Albuquerque, New Mexico June 1990

Assisted in a Phase I pedestrian inventory survey on the Gila National Forest, New Mexico in advance of a timber sale.

UNDERGRADUATE PARTICIPANT ◦ Archaeological Field School, New Mexico ◦ Department of Anthropology, University of Texas at Austin May 1990 to July 1990

Laid out mapping control networks and assisted in test excavations on a Reserve phase Mogollon site and a Three Circle to Tularosa phase Mogollon site, and assisted in a pedestrian inventory survey of the upper San Francisco River Valley on the Gila National Forest.

TECHNICAL KNOWLEDGE AND SKILLS

CULTURAL RESOURCE AND ENVIRONMENTAL LAW

Expert knowledge of Section 106 of the National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. 470f), as amended, and the regulation that implements Section 106 (36 CFR Part 800). Thorough knowledge of Section 110 of the NHPA and the U.S. Army Corps of Engineers' Appendix C to 33 CFR Part 325. Working knowledge of the Native American Graves Protection and Repatriation Act of 1990, the National Environmental Policy Act of 1969, the Archaeological Resource Protection Act of 1979, the California Environmental Quality Act of 1970, and cultural resource statutes, regulations, and guidelines for the states of California, Hawai`i, Nevada, New Mexico, and Texas.

GEOARCHAEOLOGY

Specialty in geoarchaeology with emphases on processual and historical geomorphology, paleoecology, stratigraphy, pedology, and sedimentology. Strong ability to reconstruct the depositional history and paleoenvironment of archaeological resources at multiple areal scales. Design and implement geoarchaeological data collection strategies. Analyze and interpret resultant data. Analyze and interpret geoarchaeological data from extant field records. Expertise used to provide superior contexts for material culture assemblages and architecture at sites in Hawai`i, Ukraine, and New Mexico.

MAPPING AND SPATIAL ANALYSIS

Five years of professional land surveying experience prior to 1988. Thorough knowledge of principles and techniques of land surveying, of a wide variety of optical instruments, of GPS receivers, and of the integration and manipulation of positional and attribute data from multiple sources in drafting and GIS applications. Expertise used to develop archaeological mapping and GIS programs for projects in California, Ukraine, Belize, Hawai`i, New Mexico, and Texas.

ARCHAEOLOGICAL SURVEY AND EXCAVATION

Archeological survey and excavation experience on sites that represent a wide range of cultures, time periods, and environments. Survey experience in California on nineteenth and twentieth century Karuk sites and late nineteenth to early twentieth century Euroamerican mining sites, in Nevada on Pre-Archaic, Archaic, and Protohistoric Native American sites and mid-nineteenth to early twentieth century railroad, mining, emigrant trail, and homestead sites with European, Euroamerican, and Asian components, in northeastern and southern Texas on Paleoindian, Archaic, Caddoan, and early nineteenth to early twentieth century Euroamerican sites, in western New Mexico and eastern Arizona on Archaic and Mogollon sites, on the Na Pali Coast of Kaua`i, Hawai`i on precontact Native Hawaiian sites and in the southern Crimea, Ukraine on Neolithic, Bronze Age, Greek, Roman, Byzantine, and nineteenth century Russian sites.

Excavation experience in California on late nineteenth to early twentieth century Euroamerican mining sites, early twentieth century Euroamerican homesteads, and a Feather River site with Maidu and Euroamerican components, in western New Mexico on Early Pithouse period, Three Circle, Reserve, and Tularosa phase Mogollon sites, in eastern Belize on the Middle Preclassic to Postclassic Maya site of Colha, on O`ahu, Hawai`i on early postcontact to early twentieth century sites with Native Hawaiian, Chinese, Japanese, European, and Euroamerican components in downtown Honolulu, on the East Loch of Pearl Harbor, and in Nu`uanu Valley, in Washington on an Olcott phase Native American site, and in the southern Crimea, Ukraine on Hellenistic Greek and Roman sites.

Experience in the excavation of adobe and stone architecture, house pits or pithouses, former sites of wooden and grass structures, ancient roadways, hearths, refuse pits, storage pits, and extramural surfaces.

MATERIAL ANALYSES

Experience with a wide range of prehistoric and historic material culture. Analyzed and reported on lithic assemblages from Hawai`i and New Mexico, ceramic assemblages from Ukraine and New Mexico, sediments from Hawai`i, Ukraine, and New Mexico, and fossil pollen from New Mexico. Ability to identify and date archaeological site assemblages with late eighteenth to early twentieth century architectural materials, bottle glass, tin cans, and American, British, Chinese, and Japanese ceramics.

COMPUTER LITERACY

Experience with diverse word processing, spreadsheet, database, drafting, graphics, data processing, and GIS applications on PC (Windows XP) and MacIntosh platforms in networked environments. Word processing applications used include Microsoft Word and WordPerfect. Spreadsheet applications used include Microsoft Excel. Database applications used include Microsoft Access, Quattro Pro, FoxPro, and MinArk. Drafting applications used include AutoCAD and Surfer. Graphics applications used include CorelDraw. Data processing applications used include PathFinder, SurveyLink, and GeoLink. GIS applications used include ArcView.

Recent Professional Development

Cultural Resource and Environmental Law

ACHP - FHWA Advanced Seminar: Reaching Successful Outcomes in Section 106 Review ◦ Vancouver, Washington ◦ Advisory Council on Historic Preservation, Don Klima and Carol Legard; Federal Highway Administration, Mary Ann Naber October 2007

NEPA Compliance and Cultural Resources ◦ Portland, Oregon ◦ National Preservation Institute, Joe Trnka October 2007

Section 106: How to Negotiate and Write Agreements ◦ Sacramento, California ◦ National Preservation Institute, Claudia Nissley November 2004

Consultation with Indian Tribes on Cultural Resource Issues ◦ Sacramento, California ◦ National Preservation Institute, Thomas F. King and Reba Fuller September 2003

Section 106: How to Negotiate and Write Agreements ◦ The Presidio, San Francisco, California ◦ National Preservation Institute, Thomas F. King May 2002

Introduction to CEQA ◦ Sacramento, California ◦ University of California, Davis, Continuing and Professional Education, Ken Bogdan and Terry Rivasplata July 2000

Technical Archaeology

Introduction to Historic Site Survey, Preliminary Evaluation, and Artifact ID ◦ West Sacramento, California ◦ California Department of Transportation and California Department of Parks and Recreation, Glenn Farris, Larry Felton, Julia Huddleson, Anmarie Medin, Pete Schulz, Judy Tordoff, and Kimberly Wooten September 2006

Principles of Geoarchaeology for Transportation Projects (Course No. 100246). Sacramento, California ◦ California Department of Transportation, Graham Dalldorf, Glenn Gmoser, Jack Meyer, Stephen Norwick, Adrian Praetzellis, and William Silva October 2006

Information Technology and Cultural Resource Management

GIS: Practical Applications for Cultural Resource Projects ◦ Sacramento, California ◦ National Preservation Institute, Deidre McCarthy September 2006

State Government

Introduction to California State Parks ◦ Asilomar, Monterey County, California ◦ California Department of Parks and Recreation and Monterey Peninsula College December 2001

Publications, Reports, Papers, and Workshops

Darcangelo, Jennifer, John Sharp, Michael D. McGuirt, Andrea Galvin, and Clarence Caesar

2004 *Section 106 for Experienced Practitioners: Consulting with the California SHPO (GEV4111).* Course taught on 8 September in Oakland to California Department of Transportation cultural resources personnel and private sector cultural resource consultants (8 hours).

Darcangelo, Jennifer, John Sharp, Michael D. McGuirt, and Andrea Galvin

2005 *How to Consult with the California SHPO.* Workshop presented on 23 April at the 39th Annual Meeting of the Society for California Archaeology, Sacramento, California (6 hours).

Jones & Stokes

1999a *Cultural Resource Inventory Report for Williams Communications, Inc. Fiber Optic Cable System Installation Project, Wendover, Nevada to the California State Line*. Volume 1: Draft Report. July. (JSA 98-358.) Sacramento, California. Prepared for Williams Communications, Inc., Tulsa, Oklahoma.

1999b *Cultural Resources Report for the Williams Communications, Inc. Interstate 80 Fiber Optic Cable System Installation Project*. Volume I. September. (JSA 98-358.) Submitted to Williams Communications, Inc., Tulsa, Oklahoma. On file with the State Historic Preservation Office, Carson City, Nevada.

1999c *Archaeological Site Avoidance and Monitoring Plans for Williams Communications' Fiber Optic Cable Installation In the Union Pacific Railroad Right-of-Way, Doña Ana County to Hidalgo County, New Mexico*. October. (JSA98-379.) Sacramento, California. Prepared for Williams Communications, Inc., Tulsa, Oklahoma.

2001 *Final Phase II Cultural Resource Evaluation for the Kramer Mining District, Edwards AFB, Kern and San Bernardino Counties, California*. Volume I. November. Sacramento, California. On file with the Base Historic Preservation Officer, Edwards AFB, California.

Lebo, Susan A. and Michael D. McGuirt

1997 *Geoarchaeology at 800 Nuuanu: Archaeological Inventory Survey of Site 50-80-14-5496 (TMK1-7-02:02), Honolulu, Hawai`i.* Department of Anthropology, Bishop Museum, Honolulu. (100 pp.) Submitted to Bank of Hawaii, Honolulu. On file with the State Historic Preservation Division, Honolulu.

1998a *Assessments of Stone Architecture: a Case Study from North Hālawa Valley, O`ahu.* Paper presented at the 11th Annual Hawaiian Archaeology Conference of the Society for Hawaiian Archaeology, Kailua-Kona, Hawai`i.

1998b Pili *Grass, Wood Frame, Brick, and Concrete: Archaeology at 800 Nuuanu*. Department of Anthropology, Bishop Museum, Honolulu. (142 pp.) Submitted to Bank of Hawaii, Honolulu. On file with the State Historic Preservation Division, Honolulu.

Lennstrom, Heidi A., P. Christiaan Klieger, Michael D. McGuirt, and Susan A. Lebo

1997 *Archaeological Reconnaissance of Pouhala Marsh, `Ewa District, O`ahu.* Department of Anthropology, Bishop Museum, Honolulu. (14 pp.) Submitted to Ducks Unlimited, Inc., Rancho Cordova, California. On file with the State Historic Preservation Division, Honolulu.

McGuirt, Michael D.

1996 *The Geoarchaeology and Palynology of an Early Formative Pithouse Village in West-Central New Mexico*. Unpublished M.A. thesis, Department of Anthropology, University of Texas at Austin.

1998 50-80-10-2010, 50-80-10-2016, 50-80-10-2088, and 50-80-10-2134. In *Activities and Settlement in an Upper Valley: Data Recovery and Monitoring Archaeology in North Hālawa Valley, O`ahu*, vols. 2a and 2b, edited by Department of Anthropology, Bishop Museum, pp. 1–3, 1–44, 1–5, and 1–46. Department of Anthropology, Bishop Museum, Honolulu. Submitted to State of Hawaii, Department of Transportation, Honolulu. On file with the State Historic Preservation Division, Honolulu.

2002 Committee Reports, OHP Liaison. *SCA Newsletter* 36(3):4–5.

2004 Committee Reports, OHP Liaison. *SCA Newsletter* 38(2): 7, 38(3):6–8.

2006 Preservation Archaeology. In *California Statewide Historic Preservation Plan: 2006–2010*, edited by Marie Nelson, pp. 8–15. California Department of Parks and Recreation's Office of Historic Preservation, Sacramento. Submitted to the National Park Service, Washington, D.C. On file at the California Office of Historic Preservation, Sacramento.

2008 Dealing with Multi-element Cultural Resources under Section 106. In *Historic Properties Are More Than Meets the Eye: Dealing with Historical Archaeological Resources under the Regulatory Context of Section 106 and CEQA*. Session presented on 25 April at the *33rd Annual California Preservation Conference* of the California Preservation Foundation in Napa, California, moderated by Michelle Messinger and Michael D. McGuirt (1 1/2 hours).

McGuirt, Michael D. and Leigh Ann Garcia

1991 Lithic Stew at Apache Creek: the 1990 Chipped Stone Artifact Collection from LA 2949. In *An Analysis of Lithic Artifacts Recovered During the 1990 Test Excavations at the Apache Creek Site (LA 2949), Gila National Forest, West Central New Mexico*, edited by James A. Neely and Jay R. Peck, pp. 13–61. Department of Anthropology, University of Texas at Austin. Submitted to United States Forest Service. On file at the Gila National Forest Office, Silver City, New Mexico.

McGuirt, Michael D. and Leslie H. Hartzell

1997 50-80-10-2139 and 50-80-10-2459. In *Imu, Adzes, and Upland Agriculture: Inventory Survey Archaeology in North Hālawa Valley, O`ahu*, vols. 2c and 2d, edited by Department of Anthropology, Bishop Museum, pp. 1–17 and 1–5. Department of Anthropology, Bishop Museum, Honolulu. Submitted to State of Hawaii, Department of Transportation, Honolulu. On file with the State Historic Preservation Division, Honolulu.

1998 Chapter 1: Introduction. In *Activities and Settlement in an Upper Valley: Data Recovery and Monitoring Archaeology in North Hālawa Valley, O`ahu*, vol. 1, edited by Department of Anthropology, Bishop Museum, pp. 1–14. Department of Anthropology, Bishop Museum, Honolulu. Submitted to State of Hawaii, Department of Transportation, Honolulu. On file with the State Historic Preservation Division, Honolulu.

McGuirt, Michael D. and Margaret Howard

1995 Prehistoric Background. In *Archeological Survey of Tyler State Park, Smith County, Texas*, edited by Margaret Howard, pp. 16–31. Texas Parks and Wildlife Department, Austin. On file with the Texas Historical Commission, Austin, Texas Antiquities Committee Permit No. 1484.

McGuirt, Michael D. and Shannon P. MacPherron

1998 50-80-10-2137 . In *Activities and Settlement in an Upper Valley: Data Recovery and Monitoring Archaeology in North Hālawa Valley, O`ahu*, vol. 2b, edited by Department of Anthropology, Bishop Museum, pp. 1–86. Department of Anthropology, Bishop Museum, Honolulu. Submitted to State of Hawaii, Department of Transportation, Honolulu. On file with the State Historic Preservation Division, Honolulu.

McGuirt, Michael D. and Deborah I. Olszewski

1997 50-80-10-2256. In *Imu, Adzes, and Upland Agriculture: Inventory Survey Archaeology in North Hālawa Valley, O`ahu*, vol. 2d, edited by Department of Anthropology, Bishop Museum, pp. 1–9. Department of Anthropology, Bishop Museum, Honolulu. Submitted to State of Hawaii, Department of Transportation, Honolulu. On file with the State Historic Preservation Division, Honolulu.

Mikesell, Stephen, Michael McGuirt, and Trish Fernandez

2007 Introduction to the White Papers in State Historical Resources Commission Archaeology Committee White Papers. *SCA Newsletter* 41(1):18–21.

Sharp, John, Michael D. McGuirt, Jennifer Darcangelo, and Andrea Galvin

2004 *How to Consult with the California SHPO*. Workshop presented on 18 March at the 38th Annual Meeting of the Society for California Archaeology, Riverside, California (4 hours).

Professional and Honorary Associations

Register of Professional Archaeologists
Society for American Archaeology
Society for California Archaeology
Honor Society of Phi Kappa Phi

References and Writing Samples

Available upon request.

DECLARATION OF
Christopher Meyer

I**, Christopher Meyer,** declare as follows:

1. I am presently employed by Aspen Environmental Group, a contractor to the California Energy Commission, Siting, Transmission and Environmental Protection Division, as a **Project Manager**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Executive Summary f**or the **Imperial Valley Solar Project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated:__July 27, 2010_____ Signed:______________________________

At: Sacramento, California

CHRISTOPHER MEYER

Senior Associate,
Energy and Infrastructure/Cultural Resources

ACADEMIC BACKGROUND

B.A., Biological Anthropology/Archaeology
California State University, Hayward, 1993

PROFESSIONAL EXPERIENCE

Mr. Meyer's has over thirteen years with Aspen in support of CEQA/NEPA projects including EIR/EIS, IS/MND, and EA. His background combines strong experience in environmental inspection, compliance management, and project management on large-scale construction projects with a solid background in archaeological field investigations. With over 18 years experience as an archaeologist, Mr. Meyer is familiar with the cultural settings of California and Oregon and the regulatory requirements for cultural resource management under CEQA/NEPA. He has worked closely with construction contractors, agency representatives, and Native American tribal governments to ensure projects are built on time, within budget, and in compliance with all environmental requirements. In addition to field experience, he has worked as a project manager, produced reports, document, and permit applications, and has reviewed mitigation measures for federal, State, and local government agencies as well as corporations.

Aspen Environmental Group — 1997 to present

California Energy Commission (CEC), Technical Assistance in Application for Certification Review, Siting Project Manager. In response to California's power shortage, Aspen is assisting the CEC in evaluating the environmental and engineering aspects of new power plant applications throughout the State. As part of this effort, Mr. Meyer serves as a Project Manager and supervises technical staff members, preparing the CEC's CEQA-equivalent Preliminary Staff Assessments and Final Staff Assessments in response to applications for the construction of new power plants across the State. Responsibilities include: review of applications for new power plants; identifying potential issues with proposed power plants; preparation of conditions of certification for proposed power plants; review and editing of CEC technical staff's analysis, scheduling and coordinating public workshops; tracking status of permitting process; coordinating with affected agencies to resolve potential concerns; detailed reporting; conflict resolution; and preparing briefings for the CEC Siting Committee.

California Energy Commission (CEC), Technical Assistance in Application for Certification Review, Compliance Project Manager. In response to California's power shortage, Aspen is assisting the CEC in evaluating the environmental and engineering aspects of new power plant applications throughout the State. As part of this effort, Mr. Meyer served as a Compliance Project Manager and supervised technical staff members, preparing the CEC's Conditions of Certification for construction of power plants across the State as well as managing on-going operational issues with power plants currently under license with the CEC. Responsibilities included: preparation of amendments to conditions of certification for existing power plants; review of applications for new power plants; drafting of Memoranda of Understanding with Chief Building Officials; coordinating with affected agencies to resolve concerns with potential impacts to cultural resources or threatened or endangered species; maintaining contractor construction milestones, detailed reporting; development of mitigation measures; conflict resolution; and inspection for compliance with the Conditions of Certification.

SDG&E Miguel-Mission 230 kV #2 Project Construction Monitoring and Supplemental Environmental Review Program, Lead Environmental Monitor. Under contract to the California Public Utilities Commission (CPUC), Mr. Meyer served as Lead Environmental Monitor and supervised one environmental monitor in the field, monitoring the implementation of the CPUC environmental impact report's conditions of approval for construction of the overhead 230 kV electric transmission line and substations upgrades. The project included installing a new 230 kV circuit on existing towers along the 35-mile right-of-way, as well as relocating 69 kV and 138 kV circuits on approximately 80 steel pole structures. In addition, the Miguel Substation and Mission Substation was modified to accommodate the new 230 kV transmission circuit. Responsibilities included: supervision, guidance and development of environmental monitors in field monitoring as well as the compliance review of pre-construction plans and mitigation compliance documentation, review of variance requests and temporary extra work space (TEWS) requests; recommendations for CPUC issuance of Notices to Proceed with construction and variance approvals; approval of TEWS requests; and coordination with SDG&E, construction managers and subcontractors, and landowners, local municipalities, affected and interested agencies and the public.

SCE Viejo Systems Project Construction Monitoring and Supplemental Environmental Review Program, Lead Environmental Monitor. Under contract to the California Public Utilities Commission (CPUC), Mr. Meyer served as Lead Environmental Monitor and supervises one environmental monitor in the field, monitoring the implementation of the CPUC negative declaration's conditions of approval for construction of the overhead 66 kV and 220 kV electric transmission lines and substation upgrades and construction. This Southern California Edison (SCE) project involves the installation of a 220/66/12 kV substation and 3.1-mile 66 kV transmission line in southern Orange County, California. The transmission line will traverse residential and recreational areas in the City of Mission Viejo and the substation is located in a business park adjacent to a wilderness area in the City of Lake Forest. Responsibilities include: supervision, guidance and development of environmental monitors in field monitoring as well as the compliance review of pre-construction plans and mitigation compliance documentation, review of variance requests and temporary extra work space (TEWS) requests; recommendations for CPUC issuance of Notices to Proceed with construction and variance approvals; approval of TEWS requests; and coordination with SDG&E, construction managers and subcontractors, and landowners, local municipalities, affected and interested agencies and the public.

PG&E Tri-Valley 2002 Capacity Increase Project Construction Monitoring and Supplemental Environmental Review Program, Lead Environmental Monitor. Under contract to the California Public Utilities Commission (CPUC), Mr. Meyer serves as Lead Environmental Monitor and supervises two environmental monitors in the field, monitoring the implementation of the CPUC environmental impact report's conditions of approval for construction of this combination overhead and underground 230 kV electric transmission lines and substations. Construction involves underground installation of the double-circuit 230 kV transmission line conduit and construction of a substation and several transition stations as three separate phases. Responsibilities include: supervision, guidance and development of environmental monitors in field monitoring as well as the compliance review of pre-construction plans and mitigation compliance documentation, variance requests and temporary extra work space (TEWS) requests; recommendations for CPUC issuance of Notices to Proceed with construction and variance approvals; approval of TEWS requests; and coordination with PG&E, construction managers and subcontractors, and landowners, local municipalities, affected and interested agencies and the public.

PG&E Jefferson-Martin 230 kV Transmission Line Project, Lead Environmental Monitor. Under contract to CPUC, Mr. Meyer served as Lead Environmental Monitor and supervised two environmental monitors in the field, monitoring the implementation of the CPUC compliance, and reporting program for the PG&E Jefferson-Martin Project. This project involved the installation of a 27-mile 230 kV transmission line through scenic San Mateo County in the Highway 280 corridor, urban Colma and Daly City, and across San Bruno Mountain. Responsibilities included: supervision, guidance and development of environmental monitors in field monitoring as well as the compliance review of pre-construction plans and mitigation compliance documentation, variance requests and temporary extra work space (TEWS) requests; recommendations for CPUC issuance of Notices to Proceed with construction and variance approvals; approval of TEWS requests; and coordination with PG&E, construction managers and subcontractors, and landowners, local municipalities, affected and interested agencies and the public.

California Energy Commission Emergency Siting Team, Power Plant Development, Compliance Project Manager. Under contract to the California Energy Commission (CEC), Mr. Meyer served as a Compliance Project Manager and supervised technical staff members, preparing the CEC's Conditions of Certification for construction of emergency power plants across the State. Responsibilities included: review of applications for new emergency power plants; drafting of Memoranda of Understanding with Chief Building Officials; coordinating with affected agencies to resolve concerns with potential impacts to cultural resources or threatened or endangered species; maintaining contractor construction milestones, detailed reporting; development of mitigation measures; conflict resolution; and inspection for compliance with the Conditions of Certification.

California Energy Commission Coastal Power Plant Study, Archaeologist. This research study undertaken by the California Energy Commission (CEC) examined the engineering and environmental issues associated with 24 coastal power plants. The purpose of the study was to identify, describe, and analyze issues with the potential to substantially delay or complicate the certification process for future applications to the Energy Commission for expansion or modernization of existing coastal power plants. For this study, Mr. Meyer was responsible for performing site surveys and reviewing documentation for cultural resources for all 24 Coastal Power Plants.

CEC Hydroelectric Power Plant Inventory Study, Natural Resources Analyst. Mr. Meyer assisted in the collection of power and environmental data on over 200 hydroelectric power plants located in California. Physical power data included electrical output, system upgrades, water storage capacity and peaking availability. Environmental information included developing a data base addressing sensitive species issues, fish screens and ladders, monitoring parameters and a map of known hydroelectric facilities and barriers to anadromous fish passage.

Devers-Palo Verde 500 kV Transmission Line Project EIS/EIR, southern California/western Arizona. For this EIR/EIS prepared by US Bureau of Land Management and CPUC, Mr. Meyer assisted in the review and development of construction mitigation measures for SCE's proposed 250-mile long transmission line project from the Palo Verde Nuclear power plant in Arizona to the northern Palm Springs area in California. Major issues of concern include EMF and visual impacts on property values, impacts on the area's vast recreational resources and tribal lands, and the development and evaluation of several route alternatives, including the Devers-Valley No. 2 Route Alternative, which eventually was approved by the CPUC.

Antelope-Pardee 500 kV Transmission Line Project EIS/EIR, Los Angeles County, CA. For this EIR/EIS prepared by USFS, Angeles National Forest and CPUC, Mr. Meyer assisted in the review and development of construction mitigation measures for SCE's proposed 25-mile long transmission line project from the Antelope Substation in the City of Lancaster, through the ANF, and terminating at SCE's Pardee Substation in Santa Clarita. Major issues of concern included impacts to biological, recreational, and cultural resources within Forest lands, EMF and visual impacts on property values, impacts on residences in the urbanized southern regions of the route, and the development and evaluation of several route alternatives.

Tehachapi Renewable Transmission Project (TRTP) EIR/EIS, Kern, Los Angeles, and San Bernardino Counties, CA. For this EIR/EIS prepared by USFS, Angeles National Forest and CPUC, Mr. Meyer assisted in the review and development of construction mitigation measures for

SCE's proposal to construct, use, and maintain a series of new and upgraded high-voltage electric transmission lines and substations to deliver electricity generated from new wind energy projects in eastern Kern County. Approximately 46 miles of the project would be located in a 200- to 400-foot right-of-way on National Forest System land (managed by the Angeles National Forest) and approximately three miles would require expanded right-of-way within the Angeles National Forest. The proposed transmission system upgrades of TRTP are separated into eight distinct segments: Segments 4 through 11. Segments 1 (Antelope-Pardee) and Segments 2 and 3 (Antelope Transmission Project) were evaluated in separated CEQA and NEPA documents as described above.

PG&E Northeast San Jose Transmission Reinforcement Project Construction Monitoring and Supplemental Environmental Review Program, Lead Environmental Monitor. Under contract to the California Public Utilities Commission (CPUC), Mr. Meyer served as Lead Environmental Monitor and supervised two environmental monitors in the field, monitoring the implementation of the CPUC environmental impact report's conditions of approval for construction of this combination overhead and underground 230 kV electric transmission lines and substations in the Cities of San Jose, Milpitas, and Fremont. Construction of the dual 230kV circuit involved underground construction, single-pole tower installation, and construction of the Los Esteros Substation. Given the proximity of the project to the Bay, sensitive biological resources were present, including the burrowing owl and wetland mitigation sites. Responsibilities included: supervision, guidance and development of environmental monitors in field monitoring as well as the compliance review of pre-construction plans and mitigation compliance documentation, variance requests and temporary extra work space (TEWS) requests; recommendations for CPUC issuance of Notices to Proceed with construction and variance approvals; approval of TEWS requests; and coordination with PG&E, construction managers and subcontractors, and landowners, local municipalities, affected and interested agencies and the public.

Pacific Pipeline Project EIR/EIS for the U.S. Forest Service, Angeles National Forest, and the California Public Utilities Commission, Environmental Monitor. Served as an Environmental Monitor and supervised mitigation monitoring for all sensitive resources for a construction segment along a 132-mile crude oil pipeline within southern California. Coordinated construction activities with the applicant's inspection team, archaeological specialists and Native American monitors through areas with sensitive cultural, biological, and visual resources. Monitored for hazardous materials management, storm water pollution prevention, and biological and cultural resources. Maintained daily written documentation of compliance activities.

ESSEX ENVIRONMENTAL **1995 TO 1997**

Sierra Pacific Power Co., Alturas 345 kV Electric Transmission Project, Associate. Assisted in the development of the environmental management program implementation plan for a 164-mile electric transmission line. Wrote the Storm Water Pollution Protection Plan (SWPPP) for the California and Nevada segments.

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
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APPLICATION FOR CERTIFICATION FOR THE
IMPERIAL VALLEY SOLAR PROJECT
(formerly known as SES Solar Two Project)
IMPERIAL VALLEY SOLAR, LLC

Docket No. 08-AFC-5
PROOF OF SERVICE
(Revised 5/10/10)

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*indicates change

DECLARATION OF SERVICE

I, Sabrina Savala, declare that on August, 02 2010, I served and filed copies of the attached, Supplemental Staff Assessment Part Two The original documents, filed with the Docket Unit, are accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: [http://www.energy.ca.gov/sitingcases/solartwo/index.html]

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(*Check all that Apply*)

FOR SERVICE TO ALL OTHER PARTIES:

__x__ sent electronically to all email addresses on the Proof of Service list;

__x__ by personal delivery;

__x__ by delivering on this date, for mailing with the United States Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses NOT marked "email preferred."

AND

FOR FILING WITH THE ENERGY COMMISSION:

__x__ sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (*preferred method*);

OR

_____ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 08-AFC-5
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

Original signed by: ____________________
Sabrina Savala

*indicates change