C.3 - CULTURAL RESOURCES AND NATIVE AMERICAN VALUES

Testimony of Elizabeth A. Bagwell and George E. Kline[1]

C.3.1 SUMMARY OF CONCLUSIONS

Staff[2] concludes that the proposed Genesis Solar Energy Project (GSEP) would have a significant direct impact on 14 historically significant archaeological resources and a potential significant indirect impact on 1 ethnographic resource. These resources include eight prehistoric-to-historic-period Native American archaeological sites, two of which are potential contributing elements to the prehistoric cultural landscape herein referred to as the Prehistoric Trails Network (PTN) Cultural Landscape; six sites that are potential contributing elements to a historic-period cultural landscape (historic district), herein referred to as the World War II Desert Training Center California-Arizona Maneuver Area (DTC/C-AMA) Cultural Landscape; and the ethnographic resource referred to herein as McCoy Spring National Register District (McCoy Spring).

The Reduced Acreage Alternative would have a significant direct impact on 7 of the 14 historically significant archaeological resources listed above and a potential significant indirect impact on 1 ethnographic resource. These resources include five prehistoric to historic-period Native American archaeological sites, two of which are potential contributing elements to the PTN Cultural Landscape; two historic sites that are potential contributing elements to the DTC/C-AMA Cultural Landscape; and McCoy Spring National Register District.

The Dry-Cooling Alternative would have significant direct and indirect impacts on the same 15 cultural resources listed above. However, potential indirect impacts on McCoy Spring National Register District may be greater as a result of the increased height of the dry cooling tower.

The three variations of the No Project/No Action Alternative would not impact any cultural resources. However, No Project/No Action Alternative #3, where the Bureau of Land Management (BLM) would make the proposed site unavailable for future solar development, also would ensure that there would be no future impacts to cultural resources.

Staff concludes that the alternative that has the least impact on cultural resources is a No Project/No Action Alternative followed by the Reduced Acreage Alternative. The proposed project and the Dry-Cooling Alternative have nearly identical impacts to cultural resources. However, the impacts to McCoy Spring National Register District have not yet been assessed by local Native American community members (see below).

[1] With contributions by Dwight Simons and Sarah Allred.

[2] "Staff" means BLM and Energy Commission staff, unless otherwise distinguished.

The present analysis seeks to resolve the potentially significant effects of the proposed and alternative actions on cultural resources through the development of measures that satisfy the common conceptual threads of effects resolution in the California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), and Section 106 of the National Historic Preservation Act (NHPA). Energy Commission staff here proposes that the Energy Commission fulfill the bulk of its obligations under CEQA to mitigate any potentially significant effects that the proposed or alternative actions may have on cultural resources by making a condition of certification (CUL-1) the applicant's compliance with the terms of a programmatic agreement (PA) under Section 106. The BLM here proposes to use the present cultural resources analysis and its consultation efforts under Section 106, which includes the negotiation and drafting of the PA, to demonstrate its compliance with NEPA. Energy Commission staff also expects to propose additional mitigation measures to provide for the appropriate treatment of cultural resources discovered during construction. The applicant's implementation of the terms of the PA and of the additional conditions of certification would ensure compliance with applicable LORS, as well as CEQA, NEPA, and Section 106.

If the PA is properly implemented, the proposed, the GSEP would result in a less-than-significant impact on known and newly found archaeological resources.

However, the impacts to possible Traditional Cultural Property (TCP)[3] McCoy Spring National Register District have not yet been determined. Staff expects these impacts to be minor as McCoy Spring is relatively distant from the GSEP site. However, these impacts may cause damage that can only be determined by an expert in the behavior, beliefs, and knowledge germane to understanding the property's cultural significance. Only members of the community that value the resource culturally and/or spiritually can determine impacts and suggest possible mitigation. During the consultation with Native Americans that is part of the development process for the GSEP Programmatic Agreement, possible impacts to McCoy Spring would be considered from the perspective of Native Americans, and mitigation measures for these impacts could possibly be devised, based on recommendations by Native Americans. But significant unavoidable impacts that cannot be fully mitigated may be possible. A final determination on this issue would be in the Programmatic Agreement, included in the Staff Supplemental Assessment/Final Environmental Impact Statement (SSA/FEIS), along with mitigation measures, if any.

C.3.2 INTRODUCTION

This cultural resources assessment identifies the potential impacts of the NextEra Genesis Solar Energy Project (GSEP) on cultural resources. Cultural resources are categorized as buildings, sites, structures, objects, and districts under both federal law [for the purposes of the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA), § 106] and under California state law [for the purposes of the California Environmental Quality Act (CEQA)]. Three kinds of cultural

[3] A Traditional Cultural Property, as described in the regulations for Section 106 of the NHPA, can be a site, structure, district, landscape, or natural feature that has traditional cultural significance, that is, significance based in the role the property plays in a community's historically rooted beliefs, customs, and practices.

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 prolonged 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, Latino, or Asian immigrants. They may include traditional resource-collecting areas, ceremonial sites, value-imbued landscape 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. Groupings of historic-period resources are also recognized as historic districts and as historic vernacular landscapes. Under federal and state historic preservation law, cultural resources must be at least 50 years old to have sufficient historical importance to merit consideration of eligibility for listing in the National Register of Historic Places (NRHP) or in the California Register of Historical Resources (CRHR). A resource less than 50 years of age must be of exceptional historical importance to be considered for listing.

For the GSEP staff provides an overview of the environmental setting and history of the project vicinity, an inventory of the cultural resources identified in the project vicinity, an analysis of the project's potential impacts to significant cultural resources, and recommendations of measures by which the project's adverse impacts to significant cultural resources may be resolved or mitigated.

C.3.3 GSEP CULTURAL RESOURCES LAWS, ORDINANCES, REGULATIONS, STANDARDS, AND EXECUTIVE ORDERS

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. For this project, proposed for construction on federally managed public lands, the Energy Commission must assess the project's conformance with federal laws, ordinances, regulations, standards, and executive orders as well.

CULTURAL RESOURCES Table 1
Laws, Ordinances, Regulations, and Standards to Which the GSEP is Subject

Applicable Law	Description
Federal	
Antiquities Act of 1906 16 United States Code (USC) 431–433	Establishes criminal penalties for unauthorized destruction or appropriation of "any historic or prehistoric ruin or monument, or any object of antiquity" on federal land; empowers the President to establish historical monuments and landmarks.
Archaeological Resources Protection Act of 1979 (ARPA) 16 USC 470aa et seq.	Protects archaeological resources from vandalism and unauthorized collecting on public and Indian lands.
Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) 25 USC 3001–3013	Provides for the protection of Native American graves, funerary objects, and "objects of cultural patrimony" on federal land; Establishes the procedures for determining ownership for Native American human remains, funerary objects, and other sacred objects under federal jurisdiction.
State	
Public Resources Code (PRC), Section 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 re-inter the remains elsewhere on the property in a location not subject to further disturbance.
PRC, Sections 5097.99 and 5097.991	5097.99 establishes as a felony the acquisition, possession, sale, or dissection with malice or wantonness Native American remains or funerary artifacts. 5097.991 establishes as state policy the repatriation of Native American remains and funerary artifacts.
Health and Safety Code (HSC), Section 7050.5	Makes it a misdemeanor to mutilate, disinter, wantonly disturb, or willfully remove human remains found outside a cemetery; Requires a project owner to halt construction if human remains are discovered and to contact the county coroner.

Applicable Law	Description
Local	
Riverside County General Plan, Multipurpose Open Space Element (Chapter 5), Open Space Policies OS 19.2–19.4	OS 19.2 requires the review of all proposed development for archaeological sensitivity; OS 19.3 Employs procedures to protect the confidentiality and prevent inappropriate public exposure of sensitive archaeological resources when soliciting the assistance of public and volunteer organizations. OS 19.4 Require a Native American Statement as part of the environmental review process on development projects with identified cultural resources.
Riverside County General Plan, Multipurpose Open Space Element (Chapter 5), Open Space Policies OS 19.5–19.7	OS 19.5 allows the History Division of the Riverside County Regional Park and Open-Space District to evaluate large project proposals for their potential preservation or destruction of historic sites; requires projects to provide feasible mitigation for impacts to historic sites prior to county approval. OS 19.6 enforces the California State Historic Building Code so that historic buildings can be preserved and used without posing a hazard to public safety. OS 19.7 endorses the allocation of resources and/or tax credits to prioritize retrofit of historic structures.
Riverside County General Plan, Exhibit A, CEQA Findings of Fact and Statement of Overriding Considerations, Mitigation Monitoring Program, Measures 4.7.1A, 4.7.1B, and 4.7.1C	Outlines mitigation measures for cultural resources monitoring programs.

C.3.4 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 proposed project to affect cultural resources and the primary need 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 strives to fulfill the similar goals of CEQA, NEPA, and Section 106 through the implementation of one variant of the basic process that the Energy Commission and the BLM would, under normal circumstances, have chosen to coordinate state and federal cultural resources regulatory compliance. The variant of the basic regulatory process that the Energy Commission and the BLM use for the present analysis is referred to herein as "Approach 3" (see "Alternate Approaches to Coordinated State and Federal Regulatory Compliance" subsection, below). The basic regulatory process is set out in detail below to provide a context for the derivation and use of Approach 3. The basic coordinated regulatory process for cultural resources would normally proceed through five basic analytic phases. These five phases include

1. The determination of the appropriate geographic extent of the analysis for the proposed action and for each alternative action under consideration;

2. The production of a cultural resources inventory for each such geographic area;

3. The development of determinations on the historical significance of the cultural resources in the inventory for each geographic area, unless the construction, operation and maintenance, and decommissioning and closure of the proposed or alternative actions will avoid particular resources;

4. The assessment of the character and the severity of the effects of the proposed or alternative actions on the historically significant cultural resources in each respective inventory that cannot be avoided; and

5. The development of measures that would resolve those effects that are found to be significant.

Further details of each of these phases follow below and help provide the parameters of the present analysis.

C.3.4.1 The Project Area of Analysis and the Area of Potential Effects

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 of and surrounding a project site and ancillary linear facility corridors. The area reflects, although does not necessarily equate with, the minimum standards set out in the Energy Commission Power Plant Site Certification Regulations (Cal. Code Regs., tit. 20, § 1701 et seq., app. 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 effects (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 the present analysis.

C.3.4.2 Inventory of Cultural Resources in the Project Area of Analysis

A cultural resources inventory specific to each proposed or alternative action under consideration is a necessary step in any 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 National Register of Historic Places (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, in part, the development of determinations of historical significance for the cultural resources that are found.

C.3.4.3. Determining the Historical Significance of Cultural Resources

A key part of any 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 effects 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 effects. 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.

C.3.4.3.1. 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 they meet certain 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, 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 National Register of Historical Places (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).

C.3.4.3.2. 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 Section 106 process, to receive consideration under NEPA. NEPA is implemented by the regulations of the Council on Environmental Quality, 40 CFR 1500-1508. NEPA provides for public participation in the consideration of cultural resources issues, among other issues, during agency decisionmaking.

C.3.4.3.3. Evaluation of Historical Significance Under Section 106

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 the NHPA through its implementing regulations, 36 CFR Part 800). Properties of traditional, religious, and cultural importance to Native Americans are considered under Section 101(d)(6)(A) of the NHPA.

The Section 106 process requires federal agencies to consider the effects 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 § 800.1). Significant cultural resources (historic properties) are those resources, districts, sites, buildings, structures, or objects, that are listed in or are eligible for listing on the NRHP per the criteria listed at 36 CFR § 60.4 and presented below.

Per National Park Service (NPS) regulations, 36 CFR § 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:

- Associate Value (Criteria A and B): Properties significant for their association with or linkage to events (Criterion A) or persons (Criterion B) important in our past.
- Design or Construction Value (Criterion C): Properties significant as representatives of the man-made expression of culture or technology.
- 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.3.4.4. Assessing Action Effects

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

C.3.4.4.1. Direct and Indirect Effects

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

C.3.4.4.1.1. 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.

C.3.4.4.1.2. Direct and Indirect Effects Under NEPA

The concepts of direct and indirect effects under NEPA are almost equivalent to those under CEQA. Direct effects under NEPA are those “which are caused by the [proposed or alternative] action and [which] occur at the same time and place” (40 CFR § 1508.8(a)). Indirect effects are those “which are caused by the [proposed or alternative] action and are later in time or farther removed in distance, but are still reasonably foreseeable” (40 CFR § 1508.8(b)).

C.3.4.4.1.3. Direct and Indirect Effects Under Section 106

The Section 106 regulation narrows the range of direct effects and broadens the range of indirect effects 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 National Register.” In practice, a “direct effect” under Section 106 is limited to the direct physical disturbance of a historic property. Effects that are immediate but not physical in character, such as visual intrusion, and reasonably foreseeable effects that may occur at some point subsequent to the implementation of the proposed undertaking are referred to in the Section 106 process as “indirect effects.”

C.3.4.4.2. Cumulative Impacts

Cumulative Impacts are slightly different concepts under CEQA and NEPA, and are, under Section 106, undifferentiated as an aspect of the potential effects 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 effects. It is a consideration of how the effects 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.

C.3.4.4.2.1. Cumulative Impacts Under CEQA

A cumulative impact under CEQA refers to a proposed project's incremental effects 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.

C.3.4.4.2.2. Cumulative Impacts Under NEPA

Under NEPA, a cumulative is the “impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR § 1508.7). Cumulatively significant impacts are taken into consideration as an aspect of the intensity of a significant effect (40 CFR § 1508.27(b)(7).

C.3.4.4.2.3. Cumulative Effects Under Section 106

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

C.3.4.5. Assessing the Significance of Action Effects

Once the character of the effects that proposed or alternative actions may have on historically significant cultural resources has been determined, the severity of those effects 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 effects of particular actions may be.

C.3.4.5.1. 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.

C.3.4.5.2. Significant Effects Under NEPA

Significant effects under NEPA require considerations of both context and intensity (40 CFR § 1508.27). These considerations are:

a. Context. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

b. Intensity. This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

    1. Impacts that may be both beneficial and adverse. A significant effect may exist even if the federal agency believes that on balance the effect will be beneficial.

    2. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

    3. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

    4. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

5. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

6. Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment.

C.3.4.5.3. Adverse Effects Under Section 106

In accordance with 36 CFR § 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:

a. 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.

b. 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 National Register. 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.3.4.6. Resolving Significant Effects

The concluding phase in a cultural resources analysis, whether under CEQA, NEPA, or Section 106, is to resolve those effects of a proposed or alternative action that have

been found to be significant or adverse. The terminology used to describe the process of effects resolution differs among the three regulatory programs. The resolution of significant effects under CEQA involves the development of mitigation measures the implementation of which would minimize any such effects (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 effects 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 effects 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 effects 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 BLM here proposes to use the present cultural resources analysis and its consultation efforts under Section 106, which includes the negotiation and drafting of the PA, to evidence its compliance with NEPA. 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.

C.3.4.7. Alternate Approaches to Coordinated State and Federal Regulatory Compliance

State and federal agencies have the latitude to develop any number of alternate approaches to the above basic coordinated regulatory process for cultural resources compliance. Energy Commission staff, in consultation with BLM staff, proposed three alternate approaches to cultural resources regulatory compliance for the proposed and alternative actions (Approaches 1–3), and asked the applicant to choose which of the three approaches the applicant would like to implement. The applicant chose Approach 3. Each of the three approaches is described below. The use of both Approaches 2 and 3 require a further consultation process to develop and execute a Section 106 agreement document. That process is described subsequent to the descriptions of the three approaches.

C.3.4.7.1. Approach 1

Approach 1 would typically cover solar thermal projects that encompass a modest number (< 75) of cultural resources. Under this approach, the Energy Commission and the BLM would normally try to conclude all investigations necessary to identify, evaluate the historical significance of, and assess the reasonably foreseeable and particular effects to the cultural resources in a project area of analysis prior to the Energy Commission's or the BLM's respective decisions on such projects. Where historically

significant cultural resources are affected, the conclusion of these investigations prior to agency decisions facilitates the development of more refined measures to reduce significant project effects, which, in turn, reduces post-decision delays to construction start-up, reduces redirection or stoppage of work during construction, and can substantially reduce the overall cost of cultural resources compliance. federal agency responsibility under Section 106 of the NHPA to reduce any significant project effects is typically accomplished through the execution of a memorandum of agreement (MOA) that is the result of consultation among the California State Historic Preservation Officer (SHPO), the ACHP, and other consulting parties.

C.3.4.7.2. Approach 2

Approach 2 accommodates solar thermal power projects that encompass a large number (> 75) of cultural resources. Energy Commission and BLM staff, under this approach, draft the joint NEPA and CEQA analysis for cultural resources on the basis of a relatively large (≥ 25%) and reliable sample of the cultural resources inventory in a project area of analysis, and ensure the thorough consideration and treatment of all of the resources in that inventory through the negotiation and execution of a programmatic agreement (PA) pursuant to the Section 106 regulatory process. Staff subsequently incorporates the PA into the joint analysis by reference. The implementation of a PA under the Section 106 process facilitates cultural resources compliance under both NEPA and CEQA for large and complex projects by helping to reduce the effort, time, and cost to gather information prior to a decision. The use of a PA allows for modifications in the scheduling of efforts to identify and evaluate the historical significance of the total complement of cultural resources in a project area of analysis. Such modifications in schedule can substantially reduce the scope of the effort and the time necessary to gather cultural resources information prior to a decision and, consequently, the pre-decision cost of cultural resources compliance. The major drawback to the second approach is that it may result in significant post-decision delays in construction start-up as most of the cultural resources investigations that, under the first approach, would have been done prior to the decision would, instead, be done after the decision. The overall cost of cultural resources compliance under either the first or second approach, on the basis of cost per cultural resource, is approximately the same, and the applicant may also enjoy comparable reductions in construction monitoring obligations.

C.3.4.7.3. Approach 3

Approach 3 handles cultural resources that are known prior to construction differently from those that are discovered during construction. Prior to construction, the Approach 3 would streamline the time necessary to produce the joint cultural resources analyses under NEPA and CEQA by foregoing potentially lengthy investigations to evaluate the historical significance of the cultural resources found on the surface of a project area of analysis, and, instead, addressing those cultural resources that are demonstrably subject to project effects, as though they were historically significant. Energy Commission and BLM staff would, prior to any decision, study the results of the cultural resources pedestrian survey, identify those cultural resources on the surface of the project area of analysis that would be subject to project effects, assume that all surface cultural resources are historically significant, and then develop measures to reduce project effects to those surface resources to less than significant through the use of a

phased treatment plan. Staff would ensure the thorough consideration and treatment of all of the surface resources through the negotiation and execution of a PA pursuant to the section 106 regulatory process, which staff would subsequently incorporate, by reference, into the joint analysis. The primary benefit of the proposed approach is that, depending on the nature of the cultural resources and the potential character of resulting project effects, it has the potential to substantively reduce both the amount of time necessary to gather information for the cultural resources analysis and the amount of time necessary to draft the actual analysis. This approach, however, has the real potential to result in post-decision delays in construction start-up, increases in requisite construction monitoring, and cost. Contrary to the regulatory review process under either Approaches 1 or 2, every cultural resource in a project area of analysis known prior to the onset of construction, many of which may have otherwise been found not to be historically significant, would, under Approach 3, be subject to potentially costly post-decision and pre-construction data recovery investigation. The only exceptions would be those cultural resources that staff could demonstrate that the proposed project would not affect or those resources which staff could determine were not historically significant on the basis of extant information.

Due to the absence of the finer resolution data that Approaches 1 and 2 provide, Energy Commission and BLM staff would be unable, under Approach 3, to tailor a unique construction monitoring protocol for the proposed or alternative actions. As a consequence, construction monitoring could become requisite across the entirety of the ultimate project area, and each discovery of a new archaeological deposit, during construction, would have to be dealt with on an individual basis. Each new construction discovery would be subject to an evaluation of historical significance and resources thought to be historically significant would then be subject to data recovery investigation as construction progressed. Potential increases in the overall number of requisite data recovery investigations, both for surface cultural resources known prior to construction and for new resources found during construction, in the extent and duration of construction monitoring, and in construction discovery events may cause greater construction delays and result in higher overall costs for cultural resources compliance.

C.3.4.7.4. Programmatic Agreement (PA)

The use of Approaches 2 and 3 require the development and execution of a PA under Section 106. In accordance with 36 CFR § 800.14(b), PAs are used for the resolution of adverse effects for complex project situations and when effects on historic properties, resources eligible for or listed in the NRHP, cannot be fully determined prior to approval of an undertaking. The BLM will prepare a PA in consultation with the ACHP, the SHPO, the Energy Commission, interested Native American groups, and the public at large (including tribal governments as part of government to government consultation). The PA will govern the conclusion of the identification and evaluation of historic properties (eligible for the NRHP) and historical resources (eligible for the CRHR), as well as the resolution of any significant effects that may result from the proposed or alternative actions. Historic properties and historical resources are significant prehistoric and historic cultural resources as determined by Energy Commission and BLM staff.

As a result of the anticipated significant effects of the proposed action on cultural resources and the large geographic area in the APE, a PA with the BLM, other federal

agencies, the Energy Commission, the SHPO, interested Native American tribes (government to government consultation), and the public at large is necessary. Treatment plans regarding historic properties and historical resources that cannot be avoided by project construction will be developed in consultation with stakeholders, as stipulated in the PA. When the PA is executed and fully implemented, the project will have fulfilled the requirements of CEQA, NEPA, and Section 106 of the NHPA.

The BLM is presently in the process of initiating formal consultation with the ACHP, the SHPO, Energy Commission staff, Native American groups, and the public at large on the development of a PA for the proposed action. BLM and Energy Commission staff anticipates that the draft PA would be available for public comment concurrent with the publication of the supplemental staff assessment and final environmental impact statement, presently anticipated to occur in July, 2010. Comments on the draft PA would be incorporated into the final version of the document which would be executed no later than the BLM's signature of the Record of Decision for the Right-of-Way grant for the action.

C.3.5. PROPOSED PROJECT

C.3.5.1. 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 NRHP and CRHR eligibility of any identified cultural resources within staff's area of analysis for this project.

C.3.5.1.1. Regional Setting

The proposed GSEP site is located in eastern Riverside County within the central Chuckwalla Valley, an east-southeast-trending valley in California's Mojave Desert Geomorphic Province. This province is characterized by east-west-trending ranges separated by desert valleys with enclosed drainages and dry lakes. The project area of analysis is surrounded by the Palen Mountains to the north, the McCoy Mountains to the northeast, the Little Chuckwalla Mountains to the south, and the Chuckwalla Mountains to the west. The Chuckwalla Valley is a relatively stable tectonic region located between the seismically active Salton Trough to the west and southwest, and the Garlock Fault to the north. The nearest active seismic features, the San Andreas Fault and the Brawley Seismic Zone, are located approximately 47 miles to the southwest (GSEP 2009a, p. 5.5-2). The elevation of Chuckwalla Valley ranges from under 400 feet at its lowest point to approximately 1,800 feet along the valley flanks. The surrounding mountains reach between 3,000 and 5,000 feet in elevation (GSEP 2009a, p. 5.4-1). The project region is relatively flat and generally slopes from north to south with elevations of approximately 400 to 370 feet (GSEP 2009a, p. 3-3).

Physiographically, the project vicinity lies near the toe of alluvial fans which emanate from the Palen Mountains to the north and the McCoy Mountains to the east. The eastern portion of the project site footprint is underlain by a broad, valley-axial drainage that extends southward between these mountains and drains to the Ford Dry Lake playa about one mile south of the project site footprint (GSEP 2009a, p. 3-3). This area

receives an average of 5 inches of rain per year. Rather than forming major drainages, rains create sheet wash which eventually reaches the lake bed, but more commonly is absorbed into the ground water (GSEP 2009a, 5.4-3).The site is located near the transition between the Mojave and Colorado Deserts. The dryer Mojave Desert is characterized by Joshua Tree woodland interspersed with creosote bush and white bursage. The more summer-wet climate of the Colorado Desert is also characterized by creosote bush and white bursage but in addition can support such trees as palo verde, ironwood, and ocotillo (West et al. 2007, p. 30). The project vicinity has two main vegetation types: Sonoran creosote bush scrub and stabilized and partially stabilized sand dunes (GSEP 2009a, p. 5.3-1).

The desert environment supports a variety of animals depending on the amount and source of water available. Small mammals, birds and reptiles are the most common in the proposed project vicinity. Some of the mammals in the region include rodents especially rabbits, ground squirrels, gophers, mice, and Kangaroo Rats. Larger mammals are not as common but might include mule deer, Bighorn sheep, and Pronghorn antelope. Among the carnivores, Coyote, Kit Fox, American Badger, Bobcat, and Mountain Lions have been noted. Common reptiles noted in the area include snakes, chuckwalla, Desert Iguana, Mojave Fringe-toed lizard, and the Desert Tortoise. Among the birds hawks, quail, doves, burrowing owls, songbirds, and migrating waterfowl are relatively common.

The project site footprint and linear facilities corridor land is owned and managed by the Bureau of Land Management (BLM) as part of the Big Maria Colorado Desert Planning Unit. Other units include: Imperial, Santa Rosa, Orocopia, Twenty-nine Palms, Bristol/Cadiz, Palen, Turtle Mountain Whipple Mountain, Big Maria and Picacho. The Big Maria Unit is managed as part of an amendment to the 25-million-acre California Desert Conservation Area (CDCA)—the Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan—which encompasses 5.5 million acres in the southeastern California Desert (GSEP 2009a, p. 5.3-1). Under BLM's Multiple Use Classification system, the project site footprint and linear facilities corridor lies in Class M (Moderate Use) lands. These lands are managed to provide a variety of uses such as mining, livestock grazing, recreation, utilities, and energy development. Nearby BLM-managed lands with more sensitive classifications include the Palen-McCoy Wilderness, immediately to the north of the project site footprint and the Palen Dry Lake Area of Critical Environmental Concern (ACEC), designated to protect prehistoric cultural resources, adjacent to the southwest corner of the project site footprint.

The Chuckwalla Valley is primarily undeveloped. Historically, its main role has been as an important trade and transportation route between the Pacific coast and the Colorado River. Other uses of the valley include mining, ranching, military training, and recreation. The project site footprint itself has recently been used for off-road vehicle races and sheep grazing, but neither activity currently takes place.

C.3.5.1.2. Project, Site, and Vicinity Description

The proposed facility would be located approximately two miles to the north of Interstate 10 (I-10) between the communities of Blythe, California (21 miles to the east) and Desert Center, California (32 miles to the west). Other nearby landmarks include

Ironwood and Chuckwalla State Prisons 6 miles to the south, the Blythe airport 13 miles to the east, and Joshua Tree National Park 61 miles to the west. The facility would be accessed from I-10.

The proposed GSEP consists of two independent, concentrated solar electric-generating facilities. Each facility would have a nominal electrical output of 125 megawatts (MW), for a total of 250 MW. The proposed power blocks and solar arrays would occupy approximately 1,360 acres while the evaporation ponds, access road, administration buildings, and other support facilities would occupy 440 acres. In all, the facility would occupy a total of 1,800 acres, with an additional 90 acres for a natural gas pipeline and a transmission line through which the proposed project would connect to California's electrical grid system (GSEP 2009a, p. 3-1).

The proposed project would entail the construction of two 125-MW solar collector fields, six 8-acre evaporation ponds, a 10-acre bioremediation land treatment unit, a 230-kV on-site switchyard, a new 6.5-mile, 230-kV transmission line, natural gas pipelines, access roads, a septic system, an on-site leach field, and two power blocks. Existing ground water wells would supply project water. The size and location of the septic system and associated leach field are unspecified. Each proposed power block would include: solar steam generator heat exchangers; a steam turbine generator and condensers; two wet-cooling towers; two natural-gas fired auxiliary boilers; surge volume tanks; fire suppression pumps and pump house; diesel generators; and water storage tanks (GSEP 2009a, p. 3-4). Foundation excavation for the above project components would reach between 2 and 30 feet below the present ground surface (TTEC 2010c).

Extensive earthwork would be required to grade the site to achieve an average slope of one to three percent. Grading cuts would reach approximately two feet below the present ground surface. The final expected elevation across the project site footprint is unspecified. The proposed drainage realignment would also involve extensive earthwork. In the event of an intense rain storm, the project facilities would need to be protected from storm runoff. As discussed in the Drainage Erosion and Sediment Control Plan, three off-site water diversion channels would be constructed, one passing on either side of the facility and the third through the center. The east and west storm diversion facilities would include the use of swales, ditches, and detention ponds with proposed volumes of 49 acre-feet and 66 acre-feet respectively (GSEP 2009a, p. 3-23). The exact size and location of these drainage facilities are still being determined by the applicant's engineers.

Overall, the total soil volume to be moved to level the site, including drainage diversion channels, evaporation and retention pond excavation, and berm fill placement, would be approximately 712,000 cubic yards of cut and 1,000,000 cubic yards of fill (GSEP 2009a, p. 3-25). However, since the applicant's engineers are still in the process of designing some of the project components, these figures may change.

The proposed project places one 125-MW facility on the east side of the project site footprint with a second 125 MW facility immediately adjacent to the southeast. In order to tie into the proposed Southern California Edison 500–230-kV Colorado River Substation, the applicant proposes that a transmission line from the facility would travel

in a southeast direction until it crosses the existing Imperial Irrigation District Blythe-to-Eagle Mountain 162-kV transmission line and then I-10. The line would eventually connect with the Blythe Energy Project Transmission Line (BEPTL). From that intersection, or generation-tie, the line would travel east sharing a series of transmission poles with the BEPTL until it terminates at the Colorado River Substation (GSEP 2009a, p. 3-25; TTEC 2010j).

C.3.5.1.3 Environmental Setting

Identifying the kinds and distribution of resources necessary to sustain human life in an environment, and the changes in that environment over time is central to understanding whether and how an area was used during prehistory and history. During the time that humans have lived in California, the region in which the proposed project is located, the Mojave Desert, has undergone several climatic shifts. These shifts have resulted in variable availability of vital resources, and that variability has influenced the scope and scale of human use of the vicinity of the project site. Consequently, it is important to consider the historical character of local climate change, or the paleoclimate, and the effects of the paleoclimate on the physical development of the area and its ecology.

C.3.5.1.3.1. Paleoclimate and Paleoecology

Over the last 20 years studies of pack-rat middens and lake-level studies have provided a picture of the paleoclimate and paleoecology of the Mojave and Colorado Deserts. During prehistoric times, this region fluctuated between cool-and-moist and warm-and-dry periods. These fluctuations in temperature and moisture were crucial to the human occupation of the region. Environmental changes also had important implications for the project vicinity specifically, because of the proximity of Dry Ford Lake. During cool, wet times the regional lakes filled and the necessary resources for human occupation were available. During warm, dry times the lakes dried and the region became a difficult place to live and traverse.

Recent environmental studies suggest that during the Late Pleistocene (18,000 to 8000 cal BC[4]), when humans first occupied North America, conditions in the Mojave Desert were cool and wet (West et al. 2007). Vegetation in the region was dominated by juniper and pinyon woodland, and the freshwater lakes of the region were permanent. This period was followed by the Early Holocene (8000 to 6000 cal BC), which was relatively wet and characterized by regular lake-refilling episodes. This wet environment continued to support the woodland. In contrast, the Middle Holocene (6000 to 4500 cal BC) was significantly dryer with shallow, rapidly oscillating lake levels. During this period the vegetation began to transition to desert scrub. The drying trend continued between 4500 and 1900 cal BC, resulting in persistently dry lake beds and the complete transition to the creosote biotic communities of the modern Mojave and Colorado Deserts, by approximately 4900 cal BC. From 1900 cal BC to the present, the dry

[4] There are two kinds of radiocarbon (C14) dates: uncalibrated and calibrated dates. Uncalibrated dates are not identical to calendar dates because the level of atmospheric radiocarbon (C14) has not been constant over time. Uncalibrated ages can be converted to calendar dates by means of calibration curves based on comparison of raw radiocarbon dates of samples independently dated by other methods, such as tree ring dating and stratigraphy. Such calibrated dates are expressed as cal AD or BC, where "cal" indicates "calendar years" or "calibrated years."

pattern has been dominant, with lakes filling periodically for short periods (Sutton et al., 2007, pp. 231–233).

C.3.5.1.3.2. Geology

The Mojave Desert has undergone a complex geologic history that includes sedimentation, volcanic activity, folding, faulting, uplift, and erosion. The project site footprint and linear facilities corridor is underlain by Quaternary[5] alluvial fill. This fill includes Holocene to Pleistocene alluvial fan and stream deposits, as well as lake (lacustrine) and ephemeral lake (playa) deposits. These sediments consist of gravel, sand, silt, and clay, with the coarser deposits located near the valley edges and the finer deposits near the center of the basin. The Quaternary deposits are underlain by the Pliocene Bouse Formation. This formation includes ocean and estuary deposits from an arm of the proto-Gulf of California, or alternatively, a closed brackish basin. No descriptions of this formation come from the Chuckwalla Valley, but in other locations it is a basal limestone (marl) overlain by interbedded clay, silt, sand, and tufa. The Bouse Formation is irregularly underlain by pebbles cemented in a sandy matrix, representing composite alluvial fans (called a fanglomerate). It is likely Miocene-age, but may also be Pliocene-age. Bedrock beneath the GSEP site consists of metamorphic and igneous intrusive rocks of greater than 63 million years of age (GSEP 2009a, p. 5.5-2).

C.3.5.1.3.2.1. Geomorphology

Geomorphology is the scientific study of landforms and the processes that shape them. Geomorphologists seek to understand why landscapes look the way they do, to understand landform history and dynamics, and to predict future changes through a combination of field observation, physical experiment, and modeling. Archaeologists use geomorphology to understand how archaeological sites were formed and to predict where sites of various types can be found. Over time, objects, sites and other man-made objects are moved, buried, or exposed by wind, water, plant growth, animal activity, and other natural processes. Geomorphology is a technique that helps archaeologists interpret physical clues in order to understand the specific nature of the changes that have taken place over time. In the case of the current project, geomorphology can be used to predict the location of buried sites, to estimate their current condition, and to estimate the relative age of various geological or archaeological features.

C.3.5.1.3.2.1.1. Present Process Geomorphology

Two geomorphological investigations were completed by the applicant for the proposed project vicinity (Farmer et al. 2009, app. C; TTEC 2010e). Both investigations included a review of existing literature and a site visit to ground-check information from the documentary sources. Kenney (TTEC 2010e) also conducted shallow test excavations (1.5 feet in depth), drew cross-sections of the existing stratigraphy, and estimated the age of the local geologic units.

[5] The Quaternary period is the youngest period of the Cenozoic era in the geologic time scale, spanning 2.588 +/- 0.005 million years ago to the present. It includes two geologic epochs: the Pleistocene (1.8 million–10,000 years ago) and the Holocene (the current epoch, 10,000 years ago to the present).

Kenney (TTEC 2010e) determined the minimum age of the site geologic units in both numerical and relative terms. Relative ages were assigned by stratigraphic position of the sedimentary layers. Numerical ages for sedimentary units were assigned by careful examination of the soil profiles. Desert soils are typically dated utilizing the Soil Development Index (SDI) method. With an SDI value, a soil in question may be compared to other regional soils evaluated with the same method and dated with absolute techniques such as carbon^{14}. For this study, numerical ages for sediments were arrived at by correlating site soil profiles with known dated soils in the Coachella Valley (TTEC 2010e, p. 2).

One of the geomorphic hallmarks of the Basin and Range Geomorphic Province is that streams terminate in local or regional valley sinks and not the Pacific Ocean or Sea of Cortez. A central feature of the proposed project vicinity is one of these sinks, Dry Ford Lake. Two kinds of lakes form in these kinds of conditions: pluvial and playa lakes. Pluvial or perennial lakes formed during Pleistocene glacial maximums that existed for thousands of years. Playa lakes, formed during the Holocene, are quite ephemeral, with life cycles of one to a few tens of years. Each type of lake would have supported different kinds of plants and animals, and as such, would have been attractive to humans in different ways. The sediments of these two types of lakes are also distinct. Pluvial lakes deposit sediments are: green, yellow, or olive-brown in color; consist of sand and clay; form thin, distinct layers; contain aquatic fossils; and lack saline layers. Playa lakes deposit sediments are: orange or brown in color; consist of silt and sand; do not form distinct layers; do not contain aquatic fossils; and contain saline layers. Geological bore samples from Ford Dry Lake show that it contains playa lake deposits to depths of approximately160 meters (TTEC 2010e, p. 3).

Field mapping within the GSEP vicinity yielded a local stratigraphy of only six units. These included stream deposits, both active and dormant sand deposits, alluvial deposits, and lake deposits. These six units, their distribution across the project site footprint, their estimated age and approximate depths, are described in detail below (TTEC 2010e).

Qw:

These sediments are active stream wash deposits composed of loose very fine to very coarse light brown to yellowish brown sand with small gravel. This unit is confined within the active washes and is typically 1 to 6 inches thick, but may be greater than 2 feet thick in some of the larger washes. This unit was identified but not recorded in this study.

Qs:

Qs deposits are active, dormant, and relict aeolian sand deposits. They consist of fine, yellowish brown sand sheets up to 1 foot thick. These deposits are scattered across the project site footprint on the modern ground surface of Dry Ford Lake.

Qal:

These sediments consist of Quaternary alluvium composed of fine to coarse brown sand mixed with small gravels averaging 1 foot thick. Gravel surfaces similar to desert pavement can form. This alluvium is present across most of the project site footprint and linear facilities corridor, usually overlaying older alluvium above elevation 374 feet, lake

deposits below elevation 374 feet (approximate elevation of latest Pleistocene shoreline). This sediment can be divided into two soil types, the upper which ranges in age from 1,000 to 3,000 years old, and the lower which ranges in age from 7,000 to 8,000 years old. Unit Qsr typically overlays this alluvium.

Qsr:

This unit consists of a relict sand sheet and highly degraded small coppice dune deposits. These sediments were deposited within wind transport and depositional areas during the Holocene that are no longer active. Deposits consist of fine brown sand ranging between 4 and 8 inches thick. Coarse sand and gravel surfaces similar to desert pavement can form. Soil horizons in the upper 2 to 6 inches of this unit range in age from 1,000 to 7,000 years old. Unit Qsr is the most common unit exposed on the surface and typically overlies unit Qal.

Qoaf:

This unit consists of older alluvial fan deposits likely created by Pleistocene glaciers. It is composed of yellowish red fine to coarse silty sand with small to medium gravels. These deposits are ubiquitous across the site near to the surface except for below elevation 374 feet (old shore line) where it may exist below several layers of lake deposits (Ql). This sediment can be divided into multiple soils, the youngest of which is 12,000 to 20,000 years old. The average depth of this unit was not determined, but extended beyond the bottom of most of the test units (deeper than 1.5 feet).

Ql:

Ql sediments are lake deposits associated with the ancient playa Dry Ford Lake. They consist of light yellowish brown fine to medium sandy silt with iron oxide staining. No fossils were noted. Multiple layers of this unit were noted at distinct elevations. Deposits between 377 and 380 feet were found beneath unit Qoaf indicating they were formed during the Pleistocene at least 12,000 years ago but more likely between 15,000 and 20,000 years ago. All other Ql deposits were above Qoaf indicating that they were formed during the Holocene, at least 12,000 years ago. Deposits between 373 and 374 feet are estimated to 12,000 years old, those between 367 and 370 feet in elevation to be between 8,000 and 12,000 years old, and those at 364 feet in elevation to be between 5,000 and 12,000 years old. The most recent shoreline is located at 360 feet in elevation and appears to have been created during the late Holocene. Ql sediments tend to be overlain by Qal alluvium or Qs sand dunes. These deposits are located mainly in the southwest edges of the project site footprint.

C.3.5.1.3.3. Prehistoric Background[6]

Human populations have occupied the California desert for at least 10,000 years (Moratto 1984). Stratified sites that would aid in providing temporal controls and help establish a cultural chronology are virtually unknown in the study area. The earliest explorations of the Mojave and Colorado Deserts took place in the 1930s and 1940s (Campbell 1931, 1936; Campbell and Campbell 1935; Campbell et al. 1937; Rogers 1939, 1945). During this time a basic cultural-historical outline was established, which

[6] This subsection was written by Dwight Simons and Kim Tremaine of Tremaine and Associates.

has formed the foundation for subsequent efforts (Arnold et al. 2002, pp. 46–48; Love and Dahdul 2002; Schaefer 1994; Warren 1984). However, these early attempts were based on surface scatters and inference rather than large-scale data recovery projects or regional surveys.

Numerous cultural resource management projects have resulted in dramatic increases in our understanding of the prehistory of the region. Two of the most notable synthetic works include the BLM's large-scale cultural resources inventory of the Central Mojave and Colorado Desert Regions (Gallegos et al. 1980) and Crabtree's (1980) overview. It was not until the late 1990s that any archaeological site was excavated and reported in the literature within 100 kilometers of the GSEP APEs. Jones and Klar's (2007) recent review of California archaeology builds from where these earlier authors left off, including the results of recent data recovery projects (Schaefer and Laylander 2007; Sutton et al. 2007). The following discussion and culture-historical sequence primarily follows the sources listed above.

C.3.5.1.3.3.1. Paleo-Indian Period (about 10,000–8000 BC)

The Paleoindian Period occurs during the first half of the Early Holocene. Isolated fluted projectile points, assignable to the Western Clovis Tradition have been recovered from the Pinto Basin, Ocotillo Wells, Cuyamaca Pass, and the Yuha Desert (Dillon 2002, p. 113; Moratto 1984, pp. 77, fig. 3.1, 87; Rondeau et al. 2007, pp. 64–65, fig. 5.1, table 5.1). All are surface finds, and have no associations with extinct fauna.

C.3.5.1.3.3.2. Lake Mojave Complex (8000–6000 BC)

The Lake Mojave complex, also known as the Western Pluvial Lakes/Western Stemmed Tradition (Beck and Jones 1997; Erlandson et al. 2007; papers in Graf and Schmitt 2007; Schaefer 1994, pp. 63–64; Sutton et al. 2007; papers in Willig et al. 1988), occurs during the second half of the Early Holocene. It is characterized by Great Basin Stemmed Series projectile points (Lake Mojave and Silver Lake types), abundant bifaces, steep-edged unifaces, crescents, and occasional cobble tools and ground stone tools. These artifacts often occur in undated surface contexts. Assemblage composition and site structure suggest highly mobile foragers, often traveling considerable distances. Little reliance upon vegetal resources is evidenced. The value of wetland habitats remains unclear. Lake Mojave lifeways may result from relatively rapidly changing climate and habitats during the Early Holocene. This would have produced unpredictability in resource distribution and abundance, producing a high degree of residential mobility.

C.3.5.1.3.3.3. Deadman Lake Complex (7500–5200 BC)

Currently, the Deadman Lake complex appears confined to the Twentynine Palms area. Sites usually are surficial and located on old alluvial pediments. Artifacts include small-to-medium-size contracting stemmed or lozenge-shaped points, large concentrations of battered cobbles and core tools, and abundant bifaces, simple flake tools, and ground stone tools. The abundance of cobble tools suggests an emphasis upon plant processing. The Deadman Lake and Pinto complexes may represent two different human populations practicing different seasonal/annual rounds, or Deadman Lake may represent a component of the overall Pinto complex adaptation.

C.3.5.1.3.3.4. Pinto Complex (8000–3000 BC)

The Pinto complex spans portions of the Early and Middle Holocene. Toolstone use, based on sites attributed to this complex, focus upon materials other than obsidian and cryptocrystalline silicate (CCS). Pinto Series points are stemmed with indented bases, and display high levels of reworking. Bifacial and unifacial cores/tools are common. Ground stone tools are moderately to very abundant, indicating greatly increased use of plant resources. Pinto sites occur in a broad range of topographic and environmental settings, especially within remnant pluvial lake basins. Moderate to large numbers of people, practicing a collector subsistence strategy, occupied large residential base camps for prolonged periods. Logistical forays into surrounding resource patches probably were made from these sites.

C.3.5.1.3.3.5. Possible Abandonment (3000–2000 BC)

Beginning roughly at this time, conditions in the Mojave Desert were warmer and drier. Few archaeological sites date to this period. This suggests population densities were very low. It is possible some areas were largely abandoned. This period corresponds in part to the latter part of the proposed “Altithermal Abandonment,” recognized by some prehistorians as characterizing portions of the Great Basin (see Kelly 1997, pp. 8–9).

C.3.5.1.3.3.6.Gypsum Complex (2000 BC–200 AD)

The Gypsum complex, spanning most of the Early Late Holocene, is characterized by the presence of corner-notched Elko Series points, concave-base Humboldt Series points, and well-shouldered contracting-stemmed Gypsum Series points. Numerous bifaces also occur. Manos and metates are relatively common. During the early portion of the Gypsum complex, settlement-subsistence appears focused near streams. At this time, increased trade and social complexity apparently occurred. Gypsum components are smaller, more abundant, and occur over a more diverse suite of settings than those dating previously. Evidence for ritual activities include quartz crystals, paint, split-twig animal figurines, and rock art. Gypsum sites are uncommon in the southern and eastern Mojave Desert.

C.3.5.1.3.3.7. Rose Spring Complex (200 AD–1000 AD)

Cultural systems profoundly changed in the southern California deserts during Late Late Holocene with the introduction of the bow and arrow, represented by Rosegate Series points. During this time, a major increase in population is thought to have occurred, possibly resulting from a more productive environment and a more efficient hunting technology. Sites often are located near springs, along washes, and sometimes along lakeshores. Intensive occupation is indicated by the presence of wickiups, pit houses, and other types of structures. Well-developed middens have yielded artifact assemblages containing knives, drills, pipes, bone awls, various ground stone tools, marine shell ornaments, and large amounts of obsidian. Obsidian procurement and processing apparently significantly structured settlement-subsistence.

During the middle of this period, a drought referred to as the Medieval Climatic Anomaly occurred, resulting in hypothesized resource shortages.

C.3.5.1.3.3.8 Late Prehistoric Period (1000 AD–1700 AD)

During the Late Prehistoric period, horticultural practices and pottery were introduced (most likely from the Hohokam area in southern Arizona or from northern Mexico), having its greatest impact along the Lower Colorado River (McGuire and Schiffer 1982; Schaefer 1994, pp. 65–74; Schaefer and Laylander 2007, pp. 253–254). Ceramic artifacts began to appear in the Colorado Desert approximately 1000 AD, assigned to the Lowland Patayan (Lower Colorado Buff Ware) and Tizon Brown Ware traditions (Lyneis 1988; Waters 1982a, 1982b).

A complex cultural landscape composed of rock art, trails, and geoglyphs[7] developed during the Late Prehistoric period. Trade and exchange were elaborated, with an emphasis on links between coastal southern California and the Southwest. In addition to pottery, artifact assemblages include Desert Series projectile points, shell and steatite beads, and a variety of milling tools. Obsidian use declines significantly, with CCS becoming the dominant toolstone.

C.3.5.1.3.4. Prehistory of the Chuckwalla Valley

Singer (1984) presents a lithic quarry-oriented prehistoric settlement model for the Chuckwalla Valley and environs. Over 200 prehistoric sites occur in the region. Past peoples inhabiting the area appear to have been very mobile, especially during late prehistoric and early historic times. During early historic times, native peoples inhabited towns/hamlets located along the Colorado River, within the Coachella Valley, and at major desert springs/oases.

The Chuckwalla Valley was a relatively closed resource exploitation zone. It served as an east-west oriented trade route/corridor between the Pacific Ocean and the Colorado River/greater Southwest. An extensive network of trails is present within the Chuckwalla Valley. Given its orientation and location, the valley may have been neutral territory (i.e., a buffer zone), unclaimed by neighboring native peoples. Quarry sites probably were "owned" by tribal groups. The distribution of particular types of toolstones may have corresponded to a group's territorial boundaries, and a toolstone type may not have occurred beyond the limits of a group's specific territory.

Within the Chuckwalla Valley, prehistoric sites are clustered around springs, wells, and other obvious important features/resources. Sites include villages with cemeteries, occupation sites with and without pottery, large and small concentrations of ceramic sherds and flaked stone tools, rock art sites, rock shelters with perishable items, rock rings/stone circles, geoglyphs, and cleared areas, a vast network of trails, markers and shrines, and quarry sites. Possible village locations are present at Dry Ford Lake, McCoy Spring, Palen Lake, Granite Well, and Hayfield Canyon.

A cluster of temporary habitation and special activity (task) sites occurs around a quarry workshop in the Chuckwalla Valley. The Chuckwalla Valley aplite quarry workshop

[7] Geoglyphs, also known as intaglios, were created on desert pavements by rearranging and/or clearing pebbles and rocks to form alignments, clearings, and/or figures. Rock alignments are present throughout this region, while representational figures only occur close to the Lower Colorado River. It is assumed that they played some role in sacred or ritual activities.

complex probably was used throughout the Holocene. During this period, Chuckwalla Valley most likely was occupied, abandoned, and reoccupied by a succession of ethnic groups. In the Early Holocene (i.e., Lake Mohave complex times), the area may have been relatively densely inhabited. During the Middle Holocene (i.e., Pinto and Gypsum complexes period) it may only have been sporadically visited. The subsequent Late Holocene Rose Spring and Late Prehistoric periods probably witnessed reoccupation of the valley by Yuman and Numic-speaking peoples.

C.3.5.1.3.5. Research Topics

Research topics commonly appearing in the Colorado Desert archaeological literature include toolstone procurement, ceramic traditions, horticulture, trade and exchange, and cultural landscapes.

C.3.5.1.3.5.1. Toolstone Procurement

C.3.5.1.3.5.1.1. Obsidian and Other Toolstone Materials

The geology of the Colorado Desert provided prehistoric peoples with a variety of lithic materials for artifact production (Schaefer and Laylander 2007, pp. 252–253). These included obsidian, cryptocrystalline silicates (chert), crystalline volcanics (basalt, rhyolite), quartz, and plutonic, metamorphic, and sedimentary rocks.

Coso obsidian was the dominant source of obsidian used by Colorado Desert peoples prior to 1000 AD. Other obsidian sources, from the southern Mojave Desert, include Bristol Mountains and Devil Peak (Shackley 1994). Approximately a dozen sources located in Baja California, extreme northwest Sonora, and western Arizona may also have been used (Shackley 1988, 1995, 2005). During the last thousand years, however, Obsidian Butte was the principal obsidian used in the Colorado Desert and coastal southern California (Hughes 1986; Hughes and True 1983; Laylander and Christenson 1988; Schaefer and Laylander 2007, p. 251). Obsidian Butte, located near the southern edge of the Salton Sea, was inaccessible when Lake Cahuilla rose to inundate it (130 feet above sea level).

C.3.5.1.3.5.1.2. Procurement Strategies

Several topics relating to prehistoric quarrying and tool manufacturing/use have been identified, including: distinction between formal versus the expedient procurement of toolstone (Wilke and Schroth 1989); lithic reduction strategies and transport of toolstone (Bamforth 1990, 1992); scales of production at ground stone tool quarries (Schneider et al. 1995); and differences in tools/toolstones by gender (Walsh 2000).

Bamforth (1990, 1992) considers Holocene settlement, raw material, and lithic procurement at several quarry sites in the central Mojave Desert. He suggests that quarry use was conditioned upon mobility strategies, regional quality and abundance of toolstone, as well as quarry location. Bamforth suggests that an emphasis on transporting prepared cores during the period 2000 BC–500 AD may have resulted from the formation of relatively large and stable communities in areas with concentrated plant resources.

C.3.5.1.3.5.1.3. Local Aplite Quarrying

Singer (1984) studied two quarry workshop sites located in Chuckwalla Valley. Core production and reduction from locally available aplite was emphasized. This yielded flakes and bifaces, which appear to have been exported from the quarries for final reduction at other sites. Few formed tools were observed. Those that were present were choppers and scrapers, possibly used to manufacture wooden digging or prying sticks and shafts. The quarry sites appeared to have experienced long-term occupation and use.

Manufacturing efforts appear to have been directed towards production of expedient, rapidly discarded cutting/scraping/pounding/milling tools from locally available toolstone(s) (Ludwig 2005; Schaefer and Laylander 2007, pp. 252–252; Singer 1984). Specialized tool manufacturing included production of sandstone metates along the western side of the Colorado Desert, projectile point (arrow) workshops at seasonal task sites situated around playas, and large quarries at volcanic outcrops within the Lower Colorado and Gila River Valleys, where mortars and pestles were made (Schaefer and Laylander 2007, p. 252).

C.3.5.1.3.5.2. Ceramic Traditions

Schaefer and Laylander (2007, pp. 252–253) note that buffware pottery occurring within the Colorado Desert was initially assigned to the Hakataya ceramic series (Schroeder 1958, 1979). Subsequent studies (Waters 1982a, 1982b, 1982c) place it within the Lowland Patayan Ceramic Tradition. Both typologies are based on surface collections of sherds, with little data resulting from stratigraphic excavations, or associated radiocarbon dates. Schroeder focuses upon details of temper, inclusions, and surface treatment, while Waters emphasize rim form. Both attempt to define geographic limits of production for each type. Difficulties in applying either typology and problems with stratigraphic integrity, archaeological contexts, and anomalous associated radiocarbon dates, have allowed only gross chronological estimates and have limited identification of manufacturing regions.

In the Salton Basin, some sites dating between about 350 and 1200 AD contain pottery (Love and Dahdul 2002). This evidence suggests pottery was not introduced or rarely used prior to about 1000 AD. Earlier dates from the preceding 200 years suggest Lake Cahuilla may have attracted Colorado River peoples (and their pottery). Early ceramic dates from the Colorado Desert correspond closely with the inception of widespread use of Tizon Brownware pottery in the Peninsular Ranges and along the Pacific Coast (Lyneis 1988; Griset 1996), although some dates suggest initial introduction of ceramics by 1200 BC, if not before.

Viewed regionally, pottery use within the Late Prehistoric of the Colorado Desert can be divided into three periods (Arnold et al. 2002, pp. 46–47; Love and Dahdul 2002, pp. 72–73; Waters 1982a, 1982b, 1982c). Patayan I times, about 1200–950 BC, witnessed the inception of several ceramic traditions. During Patayan II times, 950–500 BC, increased local manufacture and use of pottery occurred. Patayan III, 500–240 BC, saw the introduction of “Colorado Buff” pottery, and the westerly spread of ceramics to coastal southern California.

With respect to social and cultural factors governing pottery adoption and use within the Colorado Desert, recent analyses of pottery from the Mojave Desert and surrounding areas provide models focused on behavioral implications regarding its manufacture and function. One concern has been with determining if ceramic vessels were locally made (Eerkens 2001; Eerkens et al. 1999, 2002a; Griset 1996). Neutron activation analysis and petrographic studies have been used to identify chemical and material signatures (Eerkens et al. 2002b). Pottery manufacture does not appear to have been organized at a higher regional level. Instead, pots generally appear to have been locally produced and used, with limited exchange of pots between different groups. Production appears to have been organized at an individual or family level, emphasizing production of largely utilitarian wares.

Pottery from sites in the northern Mojave is characterized by a relatively high number of elemental signatures suggesting higher levels of mobility (Eerkens et al. 2002b). In addition to a higher degree of residential mobility, Eerkens (2003b) suggests people inhabiting the northern Mojave Desert produced a fairly large numbers of pots. The combination of high mobility and a fairly high level of pottery production is seen as leading to caching pots near lowland wetlands, which were fixed in the landscape, development of pottery attributes promoting fuel consumption, and a high degree of standardization of largely utilitarian ceramics.

Sedentism in the Owens Valley, northeast of the Project Area, appears to have developed concurrently with, or immediately prior to, an emphasis on resource storage, at approximately 500 AD. Small seed intensification appears to have occurred about 700–600 BC, at the time brownware pottery became widely used. He concludes that social models, such as those suggesting the activities of aggrandizers or the stabilization of long-distance exchange networks, do not explain these developments. The role played by decrease(s) in population-to-resource balance(s), resulting from increased population pressure, remains unclear.

Eerkens (2003c; 2004) suggests the significant increase in small seed use and the advent of brownware pottery around 700–600 BC are linked. People focused upon seeds because they could easily be privatized. That is, they could be individually owned and thus would not be subject to unrestricted sharing. Pots were a critical component of small seed intensification, because they generally were individually made and owned and could be used within houses, allowing food preparation and consumption to occur in private. Privatization of small seeds may have resulted from increased population size yielding more potential “freeloaders,” new community kinship structures, and the creation of resource surplus.

C.3.5.1.3.5.3. Horticulture

At the time of initial Euroamerican contact, 240 years ago, native peoples living along the Lower Colorado River and the Colorado Delta were growing a wide variety of domesticates and wild grasses, which provided 30–50 percent of their subsistence economy (Bean and Lawton 1993; Castetter and Bell 1951; Schaefer and Laylander 2007, pp. 253–254). Annual flooding of the floodplains along the Colorado rejuvenated the soil and provided enough moisture to sustain crops. Lower Colorado River agriculture is presumed to have begun around 700 AD. It probably spread either from

the Hokokam area (to the east), or from northern Mexico (to the southeast) (McGuire and Schiffer 1982).

Horticulture subsequently appears to have spread west from the Colorado River. Desert Tipai peoples practiced floodplain agriculture along the New and Alamo Rivers. They also constructed small dams and ditches along washes to direct irrigation water onto adjacent terraces. Agricultural elements probably reached the Imperial Valley around 300 BC Seed caches and mythological references to cultigens possibly indicate very late prehistoric adoption of agriculture. However, the caches contained both native and Old World cultigens. Thus it is unclear if agriculture penetrated west of the Peninsular Ranges in southern California before Euroamerican contact and the sustained influence that came with the establishment of Spanish missions.

Native cultigens may have reached the western Colorado Desert through trade instead of by local production (Schaefer and Laylander 2007, p. 254). Within the Colorado Desert, several archaeological sites have ceramic jars or rock-lined cache pits containing food remains of native or Old World plants (cf., Bayman et al. 1996; Swenson 1984; Wilke 1978; Wilke and McDonald 1989; Wilke et al. 1977). Pumpkin seeds occur in human coprolites (fossilized feces) from the Myoma Dunes at the north end of Lake Cahuilla, and also in a ceramic jar from the west shore of Lake Cahuilla, north of the Fish Creek Mountains. The latter dated to 580–340 BC (Wilke 1978; Wilke et al. 1977).

Early-to mid-nineteenth-century Cahuilla archaeological sites contain glass beads, flaked glass, domestic animal bones, carbonized maize and tepary beans, and uncarbonized gourds. Abundant evidence exists indicating the Cahuilla practiced irrigated agriculture during the early- and mid-nineteenth century. The paucity of macro- and micro-fossil cultigen remains from prehistoric archaeological deposits in Cahuilla territory strongly suggests agriculture did not play a significant role in the Cahuilla economy until the early nineteenth century. Early historic intensification of agriculture may have resulted from final desiccation of Lake Cahuilla, regional population growth, decreased mobility, and acculturation, including introduction of Euroamerican irrigation techniques.

In the Mojave Desert and environs, in the approximate period from 2000 to 800 BC, agriculture first was practiced in southern Nevada and environs as a consequence of the Anasazi Intrusion (Warren 1984, p. 421, fig 8.25). Maize, squash, beans, grain amaranth, and sunflowers were grown. Agriculture was practiced along with foraging for wild plants and animals. Fields probably were irrigated in some manner. Agriculture appears to have intensified over time.

The Owens Valley Paiute were Great Basin Numic-speaking horticulturalists (Lawton et al. 1976; Liljeblad and Fowler 1986, pp. 417–418; Steward 1930, 1933, 1938, 1941, 1970). Ditch and surface irrigation of blue dicks (*Brodiaea capitata*), yellow nut grass (*Cyperus esculentus*), and spikerush (*Eleocharis* sp.), was practiced. This most likely developed during late prehistoric times, possibly triggered by increased population pressure resulting from climatic change and/or immigration (Bouey 1979).

Yohe (1997) notes aboriginal cultigens, such as melons, squash, and beans, were present at two rockshelters dating to the late nineteenth or early twentieth century in Death Valley. Fowler (1995, pp. 110–112; 1996, pp. 91–98) details garden horticulture among the Southern Paiute and Panamint and Timbisha Shoshone. Stream-irrigated gardens were cultivated, in which corn, beans, squash, sunflowers, and amaranth were grown. These groups also planted gardens near springs, had communal fields with irrigation ditches, and unirrigated stream-bank garden plots. Various land management practices were employed, including intentional burning, clearing, pruning, and coppicing, transplanting and cultivation, and cleaning of water sources.

Winter and Hogan (1986, pp. 125–127, table 1) note that during protohistoric times, agriculture was practiced by the southern California/Nevada Chemehuevi and Ash Meadows, Pahrump, Las Vegas, and Moapa Southern Paiute bands. Among the crops grown were corn, beans, squash, and sunflowers. Forms of plant husbandry directed towards non-domesticates included burning to encourage growth of new plants, broadcast seed sowing, and irrigation of wild stands of bulb and seed plants (Winter and Hogan 1986, pp. 128–129, table 2). These practices are thought to have begun prehistorically, continuing and possibly expanding during early historic times. Wallace(1980) suggests Native American agriculture in the Mojave region was exclusively a historic-period phenomenon.

C.3.5.1.3.5.4. Trade and Exchange

As Schaefer and Laylander (2007, pp. 254–256) note, prehistoric and ethnohistoric Colorado Desert peoples had a highly developed network of connections linking locations within and beyond the region. High mobility produced considerable cross-cultural interaction and integration in spite of frequent open aggression and warfare between different groups. This integration and interaction occurred between mobile hunter-gatherers and sedentary horticultural peoples. They are archaeologically manifested by the spatial distribution of site types, rock art, artifacts (especially ceramics and shell ornaments), and toolstones (especially obsidian).

Archaeologists monitor the dynamics of prehistoric trade in the Colorado Desert by analysis of the distributions of artifacts made from various toolstones, shell beads and ornaments, and ceramic types and composition (Schaefer and Laylander 2007, pp. 255–256). As previously stated, with respect to toolstones, obsidian from Obsidian Butte is fairly commonly represented in sites located within montane and coastal southern California (Hughes 1986; Hughes and True 1982; Laylander and Christensen 1988). Obsidian from sources in northern Baja California may have been routed via the Colorado Desert to coastal southern California sites (McFarland 2000). Wonderstone from the Rainbow Rock source is present in western San Diego County and the northern Coachella Valley (Bean et al. 1995; Pigniolo 1995). Material for steatite artifacts found in Colorado Desert sites probably comes from sources in the Peninsular Ranges. Material for argillite artifacts may be from a central Arizona source.

Artifacts made from shellfish species inhabiting the northern Sea of Cortez occur in coastal southern California and the Great Basin (Bennyhoff and Hughes 1987; Fitzgerald et al., 2005) and may have been traded through the Colorado Desert (Schaefer and Laylander 2007, p. 255). Shells from southern California coastal species

have been found at a number of Colorado Desert sites and those in the Southwest (Ford 1983). These artifacts may have resulted from direct procurement of shells, or exchange. At the Elmore site, associated with the protohistoric recession of Lake Cahuilla, shell debitage indicates local manufacture of shell beads and ornaments (Rosen 1995). In the Coachella Valley, shell artifacts may reflect close ties to peoples living along the Santa Barbara Channel.

A cache of Lower Colorado Buffware (i.e., Patayan) anthropomorphic figures found in an Orange County site indicates interregional connections (Koerper and Hedges 1996). These also are suggested by the frequency of Lower Colorado Buffware (i.e., Patayan/Hakataya) pottery throughout the Colorado Desert (Bean et al. 1995; Cordell 1997; McGuire 1982; Schaefer and Laylander 2007, p. 255; Schroeder 1979; Shaul and Hill 1998; Waters 1982a, 1982b, 1982c). However, its use occurred among a number of prehistoric peoples practicing divergent settlement and subsistence patterns. Consequently little effort has been made to refine or apply the Patayan tradition as an integrative model.

On a local level, Plymale-Schneeberger (1993) examined pottery from three sites in Riverside County. Petrographic and geochemical analyses allowed quantitative distinction between Tizon Brown Ware and Lower Colorado Buff Ware. The study concluded that Brown Ware was locally produced while Buff Ware was imported. Seymour and Warren (2004) examined proportions of Tizon Brown Ware and Lower Colorado Buff Ware present at sites in Joshua Tree National Park and noted correspondence of pottery types with approximate boundaries of territories occupied by ethnohistorically known native peoples (that is, Cahuilla, Serrano, Chemehuevi).

Davis (1961) and Sample (1950) note that a considerable degree of historic-period trade between Native Americans occurred within and across the Colorado Desert. Trade networks across the Colorado Desert extended to the Yokuts and Chumash. Native peoples living along the Colorado River received and reciprocated goods from many groups living to the west.

C.3.5.1.3.5.5. Cultural Landscapes

In the Colorado Desert, trails, cairns, geoglyphs, cleared circles, rock rings, other desert pavement features, rock art sites, and artifact scatters appear to be elements of prehistoric-ethnohistoric cultural landscapes[8] (Schaefer and Laylander 2007, pp. 254–255; Cleland and Apple 2003). Specific localities include the Pilot Knob Complex, the rock art complex at Palo Verde Point, the Ripley Locality, and the Quien Sabe-Big Maria complex. Lower Colorado River geoglyph and rock art sites may represent prehistoric ceremonial centers, located along a route extending between sacred places, representing the cosmology and iconography of Yuman peoples (Altschul and Ezzo 1995; Cleland 2005; Ezzo and Altschul 1993; Gregory 2005; Hedges 2005; Johnson 1985, 2004; Woods et al. 1985).

[8] "Ethnohistoric" refers to the period during which Euroamerican accounts of Native Americans augment the archaeological record and Native American oral traditions as sources of information on Native Americans. Cultural landscapes, when related to specific ethnic groups, are referred to as "ethnographic landscapes" (Hardesty 2000).

C.3.5.1.3.5.5.1. Trails

During late prehistoric and ethnohistoric times, an extensive network of Native American trails was present in the Colorado Desert and environs (Heizer 1978; Cleland 2007; Sample 1950, p. 23; Apple 2005; Earle 2005; McCarthy 1993; Melmed and Apple 2009; Von Werlhof 1986). Segments of many trails are still visible, connecting various important natural and cultural elements of landscape, for example, these trails are often marked by votive stone piles (cairns) and ceramic sherd scatters (pot drops).

A late prehistoric-early historic Native American trail has been reported traversing roughly east/west through the Chuckwalla Valley (Johnson and Johnstone 1957, map 1). Johnson (1980, p.89-93, fig. 1) identifies this route as part of the Halchedhoma Trail (recorded as CA-Riv-53T) running from San Bernardino through San Gorgonio Pass to the Colorado River at present day Palo Verde Valley. In the vicinity of the Chuckwalla Valley, the trail proceeded roughly east-northeast from Hayfield Dry Lake past the future site of Desert Center to Gruendike Well. From there it went east, south of Palen Dry Lake to Sidewinder Well, then turned east, north of Ford Lake to McCoy Spring. It then headed south, around the south end of the McCoy Mountains, before going northeast towards the Colorado River. Work by McCarthy (1993, Fig. 10) suggests that offshoots of this trail may have crossed the GSEP site footprint leading to Dry Ford Lake and points to the south and west.

C.3.5.1.3.5.5.2. Geoglyphs

Geoglyphs were constructed on desert pavements by rearranging and/or clearing pebbles and rocks to form alignments, clearings, and/or figures (Arnold et al. 2002; Gilreath 2007, pp. 288–289; Solari and Johnson 1982). These rock alignments (Harner 1953) occur throughout the deserts of southeast California and adjacent portions of southern Nevada and western Arizona. Rock alignments are present throughout this region, including two recorded along the western foot of the McCoy Mountains (McCarthy 1993). Representational figures have only been noted in close proximity to the Lower Colorado River.

In the Mojave Desert, large rock alignments are found in Panamint Valley, Death Valley, Eureka Valley, and the Owens River Valley (Davis and Winslow 1965; Gilreath 2007, pp. 288–289; von Werlhof 1987). They have been interpreted as resulting from group ritual(s) (von Werlhof 1987). Many appear characterized by multiple-use episodes, with portions added through the years as part of ongoing rituals/ceremonies.

Colorado River geoglyphs include the Top Rock Maze (Rogers 1929) and a few dozen giant ground figures (Harner 1953; Setzler and Marshall 1952), often first observed from the air. During historic times, the Top Rock Maze was used by Yuman peoples for spiritual cleansing.

Johnson (1985, 2003), von Werlhof (2004), and Whitley (2000) relate the geoglyphs to Yuman cosmology, origin myths, and religion. Cation ratio dating[9] of desert varnish has

[9] Cation ratios between weathered rock varnish and unweathered rock are used as a relative dating technique to roughly determine the age of prehistoric rock carvings (petroglyphs). The quantity of positively-charged ions within the varnish (a chemically-changed layer built up of calcium and potassium

provided estimated ages of approximately 1200–1000 BC for the Colorado geoglyphs (Dorn et al. 1992; Schaefer 1994, p. 63; von Werlhof 1995), although use of the technique remains controversial (Gilreath 2007, p. 289).

Von Werlhof (1995, 2004) relates these sites to the Yuman creation story. They also may have functioned as focal points for shamanistic activities, vision quests, curing, and group rituals/ceremonies. Symbolic activities also were represented by intentional pot drop distributions along trails near water sources. The importance to Native Americans of water sources for survival during long-distance trips and seasonal rounds is obvious. Water sources also manifested significant spiritual values and often were associated with major rock art complexes (McCarthy 1993; Schaefer 1992).

C.3.5.1.3.6. Ethnographic Background[10]

Currently, it is unclear which historic Native American group or groups occupied or used the region in which the proposed project site is located, but the Chemehuevi, Serrano, Cahuilla, Mojave, Quechan, Maricopa, and Halchidhoma are the most likely.

Singer (1984, pp. 36–38) concluded the Chuckwalla Valley was not clearly assigned to any Native American group on maps depicting group territories. Following Johnson and Johnstone (1957), he observed that the west end of the Chuckwalla Valley was near the intersecting boundaries of Cahuilla-Serrano-Chemehuevi territory. Possibly before 800 BC, the Chemehuevi may have expanded into Serrano territory, occupying the Chuckwalla Valley. No evidence suggested that the Cahuilla occupied the area. Given its east-west orientation and location, however, the Chuckwalla Valley may have been neutral territory, occupied by no Native American group in particular, which served as an east-west trade and travel route.

C.3.5.1.3.6.1. The Cahuilla

A wealth of information exists regarding traditional and historic Cahuilla society and culture (see Bean and Lawton 1967 for a comprehensive bibliography of sources). Primary sources for the Cahuilla include Bean (1972; 1978), Bean and Saubel (1972), Drucker (1937), Gifford (1918), Hooper (1920), James (1960), Kroeber (1908; 1925, pp. 692–708), and Strong (1929, pp. 36–182). The Cahuilla language, divided into Desert, Pass, and Mountain dialects, has been assigned to the Cupan subfamily of the Takic branch of the Uto-Aztecan linguistic family (Golla 2007; Moratto 1984; Shipley 1978; Munro 1990, p. 218).

Territory traditionally claimed by the Cahuilla was topographically complex, including mountain ranges, passes, canyons, valleys, and desert. Bean (1978:375) described it as, "…from the summit of the San Bernardino Mountains in the north to Borrego Springs and the Chocolate Mountains in the south, a portion of the Colorado Desert west of Orocopia Mountain to the east, and the San Jacinto Plain near Riverside and the eastern slopes of Palomar Mountain to the west." The natural boundaries of the desert, mountains, hills, and plains separated the Cahuilla from surrounding Native American

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leachate over time) is compared to those within the unweathered rock beneath the varnish.

[10] This subsection was written by Dwight Simons of Tremaine and Associates and Sarah Allred of the California Energy Commission.

groups. The Cahuilla interacted with surrounding peoples via intermarriage, ritual, trade, and war. The Cahuilla, Gabrielino, Serrano, and Luiseño shared common cultural traditions, with the Cahuilla having especially close ties to the two former groups.

Cahuilla villages usually were located in canyons or on alluvial fans near water and food patches. The area immediately around a village was owned in common by a lineage. Other lands were divided into tracts owned by clans, families, and individuals. Numerous sacred sites with rock art were associated with each village. Villages were connected by trail networks used for hunting, trading, and social visiting. Trading was a prevalent economic activity. Some Cahuilla were trading specialists. The Cahuilla went as far west as the Channel Islands and east to the Gila River to trade.

Hunting and meat processing were done by men. Game included deer, mountain sheep, pronghorn, rabbits, rodents, and birds. These were pursued by individuals and communal hunting groups. Blinds, pits, bows and arrows, throwing sticks, nets, snares, and traps were used to procure game. Communal hunts with fire drives sometimes occurred.

The Cahuilla had access to an immense variety of plant resources present within a diverse suite of habitats (Barrows 1900; Bean and Saubel 1972). Several hundred plant species were used for food, manufacture, and medicine. Acorns, mesquite and screw beans, pinyon nuts, and cactus fruits were the most important plant foods. They were supplemented by a host of seeds, tubers, roots, bulbs, fruits and berries, and greens. Corn, beans, squash, and melons were cultivated. Over 200 species of plants were used as medicines.

Structures varied in size from brush structures to dome-shaped or rectangular houses, 15–20 feet long, and ceremonial houses. The chief's house usually was the largest. Used for many social, ceremonial, and religious functions, it was located near a good water source. It generally was next to the ceremonial house, which was used for rituals, curing, and recreational activities. Other structures included a communal men's sweathouse and granaries.

Mortars and pestles, manos and metates, pottery, and baskets were used to process and prepare plant and animal foods. Cahuilla material culture included a variety of decorated and plain baskets; painted/incised pottery; bows, arrows, and other hunting-related equipment; clothing, sandals, and blankets; ceremonial and ritual costumes and regalia; and cordage, rope, and mats. Games and music were important social and ritual activities for the Cahuilla.

The Cahuilla had named clans, composed of 3–10 lineages, with distinct dialects, common genitors, and a founding lineage. Each lineage owned particular lands, stories, songs, and anecdotes. Each lineage occupied a village and controlled specific resource areas. Clan territory was jointly owned by all clan members. Territory ownership was established by marked boundaries (rock art, geographic features), and oral tradition. Most of a clan's territory was open to all Cahuilla. Kinship rules determined rights to assets and responsibilities within a lineage. Each lineage cooperated in defense, large-scale subsistence activities, and ritual performance. The founding lineage within a clan often owned the office of ceremonial leader, the ceremonial house, and sacred bundle.

Artifacts and equipment used in rituals and subsistence was owned by individuals and could be sold or loaned.

The office of lineage leader usually passed from father to eldest son. He was responsible for correct performance of rituals, care of the sacred bundle, and maintenance of the ceremonial house. The lineage leader also determined when and where people could gather and hunt, administered first-fruits rites, and stored food and goods. He knew boundaries and ownership rights, resolving conflict with binding decisions. The lineage leader met with other lineage leaders concerning various issues. He was assisted in his duties by a hereditary official responsible for arranging details for performance of rituals. Other functionaries included song leaders/ceremonialists, assisted by singers and dancers.

Laws were enforced by ritual, stories, anecdotes, and direct action. Supernatural and direct sanctions were used. Tradition provided authority. The past was the referent for the present and future. Old age provided access to privilege, power, and honor. Reciprocity was a significant expectation. Doing things slowly, deliberatively, and thoughtfully was stressed. Integrity and dependability in personal relations were valued. Secrecy and caution were exercised in dealing with knowledge.

Disputes between Cahuilla villages usually arose over access to resources. Other causes included sorcery, personal insults, kidnapping of women, nonpayment of bride price, and theft. Armed conflict occurred after all other efforts to resolve things had failed. A lineage leader and/or skillful warrior lead a temporary war party. Community rituals were held before and after a fight, which usually involved ambush.

Ritual and ceremony were a constant factor in Cahuilla society. Some ceremonies were scheduled and routine, while others were sporadic and situational. The most important ceremonies were the annual mourning ceremony, the eagle ceremony, rites of passage (especially those associated with birth, naming, puberty, marriage), status changes of adults, and rituals directed towards subsistence resources. The main focus was upon performance of cosmologically-oriented song cycles, which placed the Cahuilla universe in perspective, reaffirming the relationship(s) of the Cahuilla to the sacred past, present, to one another, and to all things.

C.3.5.1.3.6.2. The Serrano

Sources for the Serrano include Bean and Smith (1978), Benedict (1924,1929), Drucker (1937), Gifford (1918), Johnson (1965), Kroeber (1925, pp. 615–619), and Strong (1929, pp. 5–35). The Serrano Cahuilla shared many traits and artifacts with the Cahuilla, discussed above. The Serrano spoke a language belonging to the Serean Group of the Takic subfamily of the Uto-Aztecan family (Golla 2007; Moratto 1984; Shipley 1978).

It is nearly impossible to assign definite boundaries to Serrano territory. Territory traditionally claimed by the Serrano included the San Bernardino Mountains east of Cajon Pass, lands in the desert near Victorville, and territory extending east in the desert to Twenty-nine Palms and south to, and including, the Yucaipa Valley.

The Serrano occupied small village-hamlets located mainly in the foothills near water sources. Others were at higher elevations in coniferous forest, or in the desert. The availability of water was a critical determinant of the nature, duration, and distribution of Serrano settlements.

Women gathered, and men hunted and occasionally fished. Topography, elevations, and biota present within the Serrano territory varied greatly. Primary plant foods varied with locality. In the foothills, they included acorns and pinyon nuts. In the desert, honey mesquite, pinyon, yucca roots, and cactus fruits were staples. In both areas they were supplemented by a variety of roots, bulbs, shoots, and seeds, especially chia. Among primary game animals were deer, mountain sheep, pronghorn, rabbits, rodents, and quail. Large game was hunted with bows and arrows. Small game was taken with throwing sticks, traps, snares, and deadfalls. Meat was cooked in earth ovens. Meat and plant foods were parched or boiled in baskets. Plant foods were ground, pounded, or pulverized in mortars and pestles or with manos and metates. Processed meat and plant foods were dried and stored. Occasional communal deer and rabbit hunts were held. Communal acorn, pine nut, and mesquite gathering expeditions took place. These communal activities involved several lineages under a lineage leader's authority.

Serrano houses were circular, domed, individual family dwellings, with willow frames and tule thatching. They were occupied by a husband and wife along with their children, and often other kin. Houses were mainly used for sleeping and storage. Most daily activities occurred outside, often in the shade of a ramada (a flat-roofed, open-sided shade structure) or other sun cover.

Settlements usually had a large ceremonial house where the lineage leader and his family lived. It was the social and religious center for each lineage/lineage set. The latter was two or more lineages linked by marriage, economic reciprocity, and ritual participation. Other structures included semi-subterranean, earth-covered sweathouses located near water, and granaries.

Serrano material culture was very similar to that of the Cahuilla. Stone, wood, bone, plant fibers, and shell were used to make a variety of artifacts. These included highly decorated baskets, pottery, rabbit skin blankets, bone awls, bows and arrows, arrowshaft straighteners, fire drills, stone pipes, musical instruments, feathered costumes, mats, bags, storage pouches, cordage, and nets.

The clan was the largest autonomous landholding and political unit. No pan-tribal union between clans existed. Clans were aligned through economic, marital, and ceremonial reciprocity. Serrano clans often were allied with Cahuilla clans and Chemehuevi groups. The core of a clan was the linage. A lineage included all men recognizing descent from a common ancestor, their wives, and their descendants. Serrano lineages were autonomous and localized, each occupying and using defined, favored territories. A lineage rarely claimed territory at a distance from its home base.

The head of a clan was a ceremonial and religious leader. He also determined where and when people could hunt and gather. Clan leadership was passed down from father to son. The clan leader was assisted by a hereditary ceremonial official, from a different

clan. This official held ceremonial paraphernalia (the sacred bundle), notified people about ceremonies, and handled ceremonial logistics.

Serrano shamans were primarily healers who acquired their powers through dreaming. A shaman cured illness by sucking it out of the sick person and by the administration of herbal medicines. Various phases of an individual's' life cycle were occasions for ceremonies. After a woman gave birth, the mother and baby were "roasted," and a feast held. Differing puberty ceremonies were held for boys (*datura* ingestion used in a structured ceremonial vision quest) and girls ("pit roasting," ingestion of bitter herbs, dietary restrictions, instruction on how to be good wives). The dead were cremated, and a memorial service was held. During the annual seven-day mourning ceremony, the sacred bundle was displayed, the eagle-killing ceremony took place, a naming ceremony for all those born during the preceding year was held, images were made and burned of those who had died in the previous year, and the eagle dance was performed.

C.3.5.1.3.6.3. The Chemehuevi

Sources for the Chemehuevi include Drucker (1937), Kelly (1934; 1936), Kelly and Fowler (1986), Kroeber (1925, pp. 593–600), Miller and Miller (1967), and Roth (1976; 1977). Carobeth Laird married a Chemehuevi and collected a large corpus of data, primarily on ritual, religion, and myth (Laird 1974a; 1974b; 1975a; 1975b; 1976; 1977a; 1977b; 1977c; 1978a; 1978b; 1984). The Chemehuevi spoke a language belonging to the Southern Group of the Numic subfamily of the Uto-Aztecan family (Golla 2007; Moratto 1984; Shipley 1978). Many traits characterizing Chemehuevi culture are very similar or identical to those of the Mohave, discussed below. Several probable Quechan traits also were noted for the Chemehuevi.

For the territory traditionally claimed by the Chemehuevi, the Colorado River formed the eastern boundary south to the Palo Verde Mountains. The boundary then ran northwest, passing east of the Ironwood Mountains, crossing the Maria Mountains, paralleling the Iron Mountains, and then running between Old Woman Mountain and Cadiz Dry Lake (Kelly 1934; Kelly and Fowler 1986, p. 369, fig. 1). Mohave territory lay to the northeast, and that of the Las Vegas group of Southern Paiute to the north-northwest.

The Chemehuevi lacked any form of overall "tribal" organization. Anthropologists refer to territorial subdivisions among the Chemehuevi as "bands." Each band was composed of a small number of camps/communities/villages. Bands most likely correspond to economic clusters (Kelly 1964). Each group was a geographic unit, associated with a definite territory. In general, each band was economically self-sufficient.

In general, Chemehuevi settlement was mobile and scattered, with residence recurring within a fixed area. Houses were closely grouped. Their occupants usually were related by blood or marriage. Settlement size ranged from 1–2 households to 10–20. Springs often were inherited private property. Married siblings often camped at the same spring.

The Chemehuevi traveled widely. They had amicable contact with the Serrano, Cahuilla, Quechan/Yumans, and other Native American groups. The Chemehuevi sometimes joined with the Mohave/Quechan to fight the Cocopa/Halchidhoma. The Chemehuevi often crossed the Colorado River and hunted deer in Quechan, Yavapai,

and Western Walapai territory. They also traded, intermarried, and competed in games with the Yavapai. To the west, the Chemehuevi hunted in the Tehachapi area and went to the Pacific Coast along the Santa Barbara Channel to get abalone shell. Sometimes, a party of 8–10 Chemehuevi men joined men from neighboring groups to make a two-month journey to the Hopi villages (in what is now New Mexico) to trade.

The Chemehuevi apparently did not eat fish, but bighorn sheep, deer, pronghorn antelope, and desert tortoise were among the animal food resources they used (Kelly and Fowler 1986, p. 369). Plant foods in this region included pinyon nuts and mescal. Men inherited rights to hunt large game within certain tracts, defined in songs using geographic references. Women gathered a great variety of plant foods, which were more important in the Chemehuevi diet than game. In addition to pinyon nuts and mescal, agave and seeds were staples. Along the Colorado River, the Chemehuevi practiced floodplain agriculture. They grew corn, squash, gourds, beans, sunflowers, amaranth, winter wheat, grasses, and devil's claw using techniques similar to Mohave agricultural practices (see below).

Chemehuevi winter houses were conical/subconical structures. They also built earth-covered houses without a front wall, similar to those constructed by the Mohave. During the summer, many Chemehuevi lived outside, often building and occupying armadas and windbreaks.

With respect to material culture, Chemehuevi baskets and cradles were made from plant fibers. Plant fibers also provided materials for rope, string, and cordage nets. Pottery, which followed Mohave patterns and styles, included cooking pots, water jars, seed germination and storage pots, spoons/scoops, and large pots for ferrying children across the Colorado River. Watercraft included log rafts and reed balsas. Clothing consisted of double skin or fiber aprons and sandals for men and women. The Chemehuevi commonly had pierced ears and wore body paint.

Monogamy was the commonest form of marriage among the Chemehuevi, but some men had more than one wife. Women gave birth in a special enclosure, followed by a 30-day period of seclusion for mother, father, and child. Puberty rites for boys and girls were held, with the former focused on acquisition of hunting skills. Cremation of the dead was traditional, replaced by in-ground burial in the historic period.

In general, no central political control existed. Territorial boundaries were not rigid, and some bands were named, while others were not. The basic social and economic unit was the nuclear family and could include other close kin. Groups of individual households moved together on hunting and gathering trips, returning to the same spring or agricultural site. Most large bands had a headman whose leadership was more advisory than authoritative. He was usually succeeded by his eldest son.

The principal role of Chemehuevi shamans was curing illness. They acquired their healing powers through dreams rather than through the use of *datura* or a trance. Chemehuevi families held a mourning ceremony ("cry"), with which several speeches and songs were associated, within the year after the death of a relative. The "cry" was sponsored by the family and included the ceremonial burning of material goods.

The Chemehuevi had deer and mountain sheep song-dances, held for entertainment and hunting success. The Chemehuevi had other songs, as well: bird, salt, quail, and funeral songs. During winter evenings, men narrated a rich body of traditional stories and myths. These performances often included mimicry, song, and audience participation. Oral tradition related people to social norms, their territories, and to the subsistence resources present within them.

C.3.5.1.3.6.4. The Mohave

Information regarding the traditional lifeways of the Mohave has mainly been drawn from the accounts of early explorers and/or fur trappers who were among the first to encounter native groups, as well as from the later ethnographic accounts of anthropologists, usually well after the influences of Euro-American contact had begun to alter traditional ways of life. The following summary derives mainly from Kroeber (1925) and Stewart (1983a, 1983b).

The name Mohave is a variation on the name Hamakhava, which is what the tribal people called themselves (Kroeber 1925, p. 727). The Mohave language is classified into the Yuman subfamily of the Hokan language family. The Mohave were the northernmost and largest tribe of the River and Delta Yumans, who comprised a series of agricultural tribes that occupied the lower Colorado and Gila Rivers. The traditional ethnographic territory attributed to the Mohave includes the Mojave, Chemehuevi, and Colorado River Valleys along the lower Colorado River at the intersection of the borders of Arizona, Nevada, and California. In pre-contact times, Mohave tribal settlement is reported to have centered in the Mohave Valley where their population densities were observed to be the greatest (Stewart 1983b, p. 55).

The Colorado River served as something of an oasis in the otherwise harsh, dry environment that surrounded the river valleys. The spring overflow of the river, which spread gently over the bottomlands, left behind a rich silt deposit in its recession. It is within these bottomlands that the Mohave cultivated crops, which served as the foundation of their subsistence economy. Their agricultural methods were relatively simple, consisting of planting seeds on the richly silted floodplains and allowing their crops to mature with a minimum of maintenance or effort. Corn was the primary crop, but several varieties of tepary beans, pumpkins, melons, and other plants were also grown. Once harvested, the portions of the harvest that were not immediately consumed were dried in the sun and stored in large basketry granaries. The Mohave supplemented their diet mainly by gathering wild plants and by fishing, which served as their principle source of flesh non-plant food. Hunting played a minor role in the Mohave subsistence economy (Stewart 1983b, pp. 56–59).

Technology of the Mohave was relatively simple, and tools were reported to have been crafted to meet only the minimum requirements of utility (Stewart 1983b, p. 59). According to Kroeber (1925, p. 736), the farming implements consisted of only two items: a heavy wooden staff or digging stick for planting and a spatulate wooden hoe-like implement, whose square edge was pushed flat over the ground to control weeds. Metates, consisting of a rectangular block of stone, were used for grinding corn, wheat, and beans, and both stone and wooden pestles, as well as stone mortars, were also used for food processing (Kroeber 1925, pp. 736–737). Fish were commonly taken with

seines, large basketry scoops, sieves, dip nets, and weirs. The bow and arrow and cactus-spine fish hooks were also used for fishing. Mojave basketry was crudely woven, and their pottery was basic and utilitarian (Stewart 1983b, p. 59). Since hunting was of relatively little significance to the Mohave, hunting devices and techniques were not well developed, consisting mainly of snares, nets, bow and arrow, or curved throwing sticks (Stewart 1983b, pp. 59–61).

Mohave political and social organization was very informal, and no one individual or group had significant authority over another. Despite the Mohave's loose division into bands or local groups that were spread out over great distances, their cohesion as a tribe was very strong, and they considered themselves as one people occupying a nation with a well-defined territory (Stewart 1983a, 1983b).

The nuclear family was the basic unit of economic and social cooperation, although the extended family constituted the core of a settlement. Rather than large centralized villages, Mohave settlements were widely distributed along the riverbanks in close proximity to arable lands. Houses were situated on low rises above the floodplain and often separated by as much as a mile or two (Stewart 1983b, p. 57). During most of the year, the Mohave slept under ramadas; however, during the colder season, they occupied more substantial, semi-subterranean, rectangular earth-covered houses.

Warfare was a dominant strain in River Yuman culture, and the Mohave's strong tribal unity served them well in times of warfare. They apparently traveled great distances to do battle, and their principle weapons were bows and arrows and hard wood clubs. According to Kroeber (1925, p. 727), their main motivation was sheer curiosity, as they liked to see other lands and were eager to know the manners of other peoples, but were not heavily interested in trade.

The Mohave were culturally similar to the other River and Delta Yumans: the Quechan, Halichidhoma, Maricopa, and Cocopa. During ethnographic times, the Quechan were considered friends and allies of the Mohave, while the Halchidhoma, Maricopa, and Cocopa were considered to be enemies with whom the Mohave engaged in warfare (Stewart 1983b, p. 56). The Mohave were also friendly with the Upland Yuman tribes of the Yavapai and Walapai of western Arizona, although relations with the Walapai were somewhat mixed.

One of the most important rituals observed by the Mohave centered on death, namely the funeral and subsequent commemorative mourning ceremony. As soon as possible after death, the deceased was cremated upon a funeral pyre along with all of his or her possessions. The house and granary of the deceased were also burned. It was believed that by burning, these things would be transmitted to the land of the dead along with the soul of the deceased (Stewart 1983b, pp. 65–67).

Due to their relatively remote location inland, the Mohave maintained their independence throughout the Spanish period of the sixteenth and seventeenth centuries and were only rarely visited by explorers during that time. The few Spanish accounts of encounters with the Mohave provided similar descriptions of Mohave lifeways as those reported later by ethnographers. It is believed that the ancestors of

the Mojave resided in the area for at least 1000 years and the mode of life in prehistoric times is thought to be similar to that observed historically (Stewart 1983b, p. 56).

C.3.5.1.3.6.5. The Quechan/Yuma

The following summary of the Quechan or Yuma is derived mainly from Bee (1983), Kroeber (1925), and Stewart (1983a).

Quechan is a variation on the names Kwichyan or Kuchiana, which are the names the tribe called themselves, but this group is also commonly known as the Yuma. The Quechan are among the Yuman-speaking tribes who occupied the lower Colorado River where it forms the boundary between California and Arizona. According to Kroeber (1925, p. 782), the Quechan and their neighbors to the north, the Mohave, appear to be virtually identical in terms of their agriculture, manufactures, clothing, hair styles, houses, warfare, and sense of tribal unity.

The ethnographic territory traditionally associated with the Quechan, now divided between the states of California and Arizona, is centered around the confluence of the Colorado and the Gila Rivers, extending several miles north and south along the Colorado and east along the Gila. Quechan legend tells of a southward migration of their ancestors from a sacred mountain; however, it is not known when the ancestors of the Quechan first settled near the confluence (Bee 1983, p. 86). No group of this name was mentioned in the account of Hernando de Alarcón when he passed through the area during an expedition in 1540, and the first reference to this group did not appear in Spanish documents until the late seventeenth century, at which time they were settled around the river confluence area (Bee 1983, p. 86).

In an environment otherwise surrounded by dry desert terrain, the subsistence economy of the Quechan focused on riverine agriculture, which was one of the main sources of food for the tribe. Crops were cultivated in the richly silted river bottomlands following the recession of the spring floods and provided a relatively high yield in exchange for relatively low labor output (Bee 1983, pp. 86–87). The main cultivated crops included corn, tepary beans, pumpkins, and gourds. In post-contact times, watermelons, black-eyed peas, muskmelons, and wheat were introduced by Europeans and brought into cultivation by the Quechan, as well. The Quechan also relied on the gathering of wild foods, the most important of which were mesquite and screw-bean pods, although a variety of other wild plants were also collected (Bee 1983, p. 87; Castetter and Bell 1951, pp. 187–188). Fishing was of minor importance, as there were few species in the lower Colorado River suitable for eating. Among the fish sought were the humpback, white salmon, and boneytail, which were sometimes caught with unfeathered arrows or cactus-spine hooks, but more often taken with traps and nets during floods (Forde 1931, pp. 107–120). Given the low incidence of game available in the area, hunting played a minor role in the overall subsistence economy (Bee 1983, p. 86).

Like the Mohave, Quechan tribal settlements, or rancherias, consisted of extended family groups that were widely dispersed along the riverbanks. Settlements shifted throughout the year, dispersing into smaller groups along the bottomlands during the spring and summer farming seasons and reconvening into larger groups on higher ground, away from the river, during the winter and spring flood periods (Bee 1983, pp.

87–88). The geographic dispersion of the households within the rancheria groups was closely correlated with the condition of the rivers and the technology of riverine agriculture (Bee 1983, p. 89). The warm climate and scant precipitation made substantial housing unnecessary for most of the year, so most people made use of ramadas or dome-shaped arrowweed shelters. Each rancheria typically had one or two large, earth-covered shelters for the rancheria leaders' families, but these shelters also accommodated small crowds during colder weather (Forde 1931, p. 122).

Much like the Mohave, Quechan technology lacked technical or decorative elaboration beyond the demands of minimal utility (Bee 1983, p. 89). Quechan bows did not feature "backed" construction and so lacked power, and their arrows were frequently untipped, so the bow and arrow's range was short and the penetrating power weak. Sharpened staffs served as digging sticks or, when cut in longer lengths, as weapons (Bee 1983, p. 89).

In terms of property, there were no marked gradations in wealth, and social pressure favored the sharing of one's abundance with others who were less fortunate. Land ownership was informal, and people did not show much interest in the accumulation of material goods beyond the immediate needs of the family group or the surplus maintained by local leaders for redistribution to needy families within their rancheria (Bee 1983, p. 89). Lands were not inherited by family members upon the death of an individual; rather, the lands of the deceased were abandoned, and replacement plots were sought by the family members.

Despite the wide distribution of settlements, the Quechan had a strong sense of tribal unity. As with their neighbors and allies, the Mohave, warfare played a major role in Quechan culture, and it was during times of warfare that tribal unity was most prevalent among the individual settlements (Bee 1983, p. 92). Their major enemies were the Cocopa and the Maricopa, and they often allied themselves with the Mohave in strikes against common enemies (Bee 1983, p. 93). Bee (1983, p. 93) suggests that warfare among the riverine peoples may have increased in scale and intensity during the eighteenth and early nineteenth centuries due to new economic incentives, such as the opportunity to trade captives to the Spaniards or to other tribes for horses or goods.

Quechan social and political organization, like that of the Mohave, appears to have been very informal, with no one individual or group having significant authority over others. Two types of tribal leadership have been reported for the Quechan, one for civil affairs and the other for war, but it is questionable how influential these leadership roles may have been. Each rancheria had one or more headmen, but their authority was contingent upon public support and continued demonstration of competence. According to Bee (1983, p. 92), important matters at either the tribal or the rancheria level were always decided by consensus, sometimes after long debates dominated by the better and more forceful speaker.

Another important aspect of Quechan society that was shared with the Mohave concerns the commemoration of the dead, which was an elaborate ceremony involving wailing and the destruction of property and ritual paraphernalia. All possessions of the deceased, including the family home, were destroyed or given away (Bee 1983, pp. 89, 93–94).

C.3.5.1.3.6.6. The Maricopa and the Halchidhoma

Ethnographic information for the Maricopa and Halchidhoma is meager in comparison to the Mohave and the Quechan. The following brief summary is derived from Harwell and Kelly (1983) and Stewart (1983a).

The Halchidhoma first entered written history in the early seventeenth century with the account of Juan de Oñate, who encountered the "Alebdoma" or "Halchedoma" during a Spanish expedition on the lower Colorado River, below its junction with the Gila River. When later encountered by missionary-explorer Eusebio Francisco Kino in the early eighteenth century, the Halchidhoma (or "Alchedoma," as they were referred to by Kino) had moved farther north up the Colorado beyond the Gila. The traditional territory attributed to the Halchidhoma lay along the lower Colorado between the Mohave and the Quechan territories. They were later driven from that area under pressure from their hostile Mohave and Quechan neighbors and moved to the middle Gila River area, where some merged with the Maricopa (Stewart 1983a).

The term Maricopa refers to the Yuman-speaking groups who in the early nineteenth century occupied the area along or near the Gila River and its tributaries (in what is now southern Arizona), but who earlier had occupied the lower Colorado River area. The Maricopa language is closely related to Quechan and Mohave, all three of which are classified as members of the River branch of the Yuman language family (Harwell and Kelly 1983, p. 71). The Maricopa call themselves *pi•pa•s*, "the people." The name Maricopa is an English abbreviation of the name Cocomaricopa, first used by Eusebio Kino in the late seventeenth century (Harwell and Kelly 1983, p. 83).

The Maricopa, who by the early nineteenth century included remnant tribes of the Halyikwamai, Kahwan, Halchidhoma, and Kavelchadom, share common origins and are culturally similar to both the Quechan and the Mohave, the most prominent traits of which included floodwater agriculture and cremation of the dead. Their material culture was also essentially the same (Harwell and Kelly 1983, p. 71). The Colorado River Maricopa lived in low, rectangular, earth-covered houses, but the Maricopa of the Gila River had adopted the round houses of their Piman neighbors. Technology was of little interest to the River Yumans and remained at a low level of development (Stewart 1983a).

C.3.5.1.3.7. Historical Background[11]

The Mojave Desert area, in which the GSEP is located, has remained one of the more sparsely populated regions of the American West. The harsh arid environment and paucity of natural water supply has presented a challenge to the development of trans-desert routes for the movement of people and goods, to the exploitation of resources in the area, and to the establishment of permanent settlement. The major historical themes for the Mojave Desert region and GSEP vicinity, in particular, are centered on the establishment of transportation routes, water access, mineral exploitation, and military uses. The following brief historical background of the Mojave Desert area in eastern Riverside County is derived from the following sources: Bischoff (2000); Castillo

[11] This subsection was written by Sarah Allred of the California Energy Commission.

(1978); Farmer, et al. (2009); GSEP (2009); von Till Warren (1980); and WESTEC (1982).

The earliest recorded history of the lower Colorado River region began with the expeditions of Spanish explorers, who were lured by rumors of a rich northern Indian civilization. However, due to the Spaniards' failure to find the fabled northern treasures and the remoteness of the region, the Mojave Desert was seldom visited during the Spanish and Mexican periods.

The desert region has produced a variety of mineral deposits, including gold, silver, fluorite, manganese, copper, gypsum, and uranium. The 1880s and 1890s were years of relative prosperity for mining regions of eastern Riverside County, and intermittent mining activity has occurred in the area since that time. Early mining activities played a significant role in stimulating early occupation and travel across the arid desert. Following the end of the Mexican period in 1848 and the onset of the California Gold Rush in 1849, a flood of gold-seeking emigrants began to pour into California, many of whom were unprepared and suffered extreme hardships during the overland trek through the desert.

One of the earliest major trans-desert trail/wagon routes established in the vicinity of the GSEP was known as Frink's Route. Frink's Route was established in the mid nineteenth century (prior to 1856), connecting southern California supply points with mines and outposts along the Colorado River. Frink's route appears to have passed south of the GSEP site footprint. Another important stage route was the Bradshaw Trail, an overland stage route pioneered by William Bradshaw in 1862. It began in San Bernardino and passed through San Gorgonio Pass, Palm Springs, and the north shore of the Salton Sea before reaching the Colorado River near Blythe. This route followed traditional Indian trails and was used between 1862 and 1877 to haul miners and other passengers to the gold fields at La Paz, Arizona (now Ehrenberg). Wiley's Well Road, which intersects the GSEP linear facilities corridor, was an offshoot of the Bradshaw Trail. The construction and expansion of the Southern Pacific Railroad between Phoenix and Los Angeles by way of Yuma in the late 1870s also brought travelers and supplies to more remote areas, enabling further development of mines and irrigation.

Around the turn of the last century gypsum was found in the McCoy Mountains. A mining town, Midland, was established here. From 1925 to the 1960s, Midland was a company town owned by the U.S. Gypsum Co. The company had harvested vast amounts of gypsum found in the area. At its peak, the town had a population of approximately 1,000. The Arizona and California Railway, built between 1903 and 1907, was a 50 mile spur rail route connecting Blythe and Midland to the main Santa Fe Railway line at the town of Rice. There were daily trains along this line until the late 1930s. Midland was a thriving mining town until the 1960s when it was entirely abandoned.

Automobile travel across and within the Colorado Desert area first developed using existing wagon roads. By the early twentieth century, the automobile became the preferred means of transportation, and in 1916, Congress approved an Act to identify safe travel routes and ensure protection of available water within the least documented regions of the desert (Brown 1920). The Mecca-Blythe-Ehrenberg route, which

approximates the current Interstate 10, is one such route identified under the Act and is located near the southern GSE project boundary. Travelers along these routes relied on natural water sources such as McCoy Spring and wells excavated by wagon road users. Most of the wells in eastern Riverside County were excavated by early prospectors and/or landowners and were often named for the men who dug them. Among the early known wells near the GSEP site footprint and linear facilities corridor include the Hopkins Well, Wiley's Well, and the Ford Well, which appear on the 1920 USGS Water Supply Paper Map, south of the GSEP limits. Portions of Wiley's Well Road, where it passes near McCoy Spring, may have been improved in the 1940s and 1950s to provide access to Midland after rail service ceased.

The GSEP site footprint and linear facilities corridor falls within the limits of Gen. Patton's World War II Desert Training Center/California-Arizona Maneuver Area (DTC/C-AMA), which was in operation from 1942-1944. The area was chosen by Gen. George S. Patton, Jr. to prepare troops for the harsh conditions and environment of combat for the North Africa Campaign. At 12,000,000 acres, the DTC/C-AMA was the largest-ever military training center, stretching from west of Pomona, California, to Yuma, Arizona, and north into Nevada. The valley bordered by the Palen, Little Maria, and McCoy Mountains is considered one of the most extensive maneuver areas in the DTC/C-AMA. After two years in operation and the training of one million troops, the DTC/C-AMA was closed in 1944 as a result of the allied victory in North Africa and the need for trained troops elsewhere. Following the closure of the DTC/C-AMA dismantling and salvage efforts began and the land was ultimately returned to private and government holdings. The remains of the DTC/C-AMA areas consist of rock features, faint roads, structural features, concertina wire, tank tracks, footprints of runway and landing strips, foxholes and bivouacs, concrete defensive positions, refuse, and trails.

C.3.5.1.3.8. Cultural Resources Inventory

A project-specific cultural resources inventory is a necessary step in staff's effort to determine whether the proposed project may cause significant impacts to historically significant cultural resources and would therefore have an adverse effect on the environment.

The development of a cultural resources inventory entails working through a sequence of investigatory phases. 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 within and near the proposed project, assessing the results of any geoarchaeological studies or environmental assessments completed for the proposed project site, and compiling recommendations or determinations of historical significance for any cultural resources that are identified.

This subsection describes the research methods used by the applicant and Energy Commission staff for each phase and provides the results of the research, including literature and records searches (California Historical Resources Information System (CHRIS) and local records, archival research, Native American consultation, and field investigations.

This subsection also provides a brief description of each cultural resource identified by the applicant. For this project, staff has used the analytic process of “approach 3” (defined above under “Methodology and Thresholds for Determining Environmental Consequences”), so the inventory consists of the body of resources the applicant identified in the AFC, and the descriptions are limited to what the applicant provided, either with the AFC or in response to staff’s data requests.

Staff’s assessments of the project’s impacts on known cultural resources, potential impacts on previously unidentified, buried archaeological resources, and proposed mitigation measures for the project’s impacts are presented in a separate subsection below.

C.3.5.1.3.8.1. Area of Potential Effects (APE) and Project Area of Analysis

The concept and general definition of the APE (and the approximately equivalent CEQA project area of analysis) are discussed above under “Methodology and Thresholds for Determining Environmental Consequences.” For this project, staff has defined the following APEs.

For archaeological resources, the APE is defined at the proposed project site footprint, plus a buffer of 200 feet, the project linear facilities routes plus 50 feet to either side of the route and the maximum depth that would be reached by all foundation excavations and by all pipeline installation trenches. This definition serves to address both direct and indirect impacts on resources whose dimensions may well extend below the surface and beyond the project site.

For ethnographic resources, the APE is expanded to take into account traditional use areas and traditional cultural places which may be further afield than the project site footprint or the project vicinity. The areas of analysis for ethnographic resources may include viewscapes that contribute to the historical integrity of a subject resource. Ethnographic resources are often identified in consultation with Native Americans as well as other ethnic or cultural communities, and issues that are raised by these communities may define the APE. For this project the ethnographic APE is the geographic area around and including the proposed project where the project has the potential to physically or visually degrade ethnographic resources.

For built-environment resources in the rural context of the proposed project, the APE is defined as the project site and any above-ground linear facilities, plus a half-mile buffer. As this project is located in an undeveloped area, the APE was reduced to include only the above-ground linear facilities and a half-mile buffer.

C.3.5.1.3.8.2. Background Inventory Research

Various repositories in California hold compilations of information on the locations and descriptions of cultural resources older than 45 years that have been identified and recorded in past cultural resources surveys. Applicants acquire information specific to the vicinity of their project from certain repositories and to provide it to staff as part of the AFC submitted to the Energy Commission. Additionally, to acquire further information on potential cultural resources in the vicinity of a proposed project, the applicant is required to make inquiries of knowledgeable individuals in local agencies

and organizations and to consult Native Americans who have expressed an interest in being informed about development projects in areas to which they have traditional ties.

The archaeologists for the applicant reviewed a number of resources during their background inventory research. This research of the GSEP site footprint and vicinity identified 30 previous cultural resources projects, 85 previously-identified sites, 117 previously-identified cultural isolates, 1 ethnographic resource, and no built-environment resources (Farmer et al. 2009).

C.3.5.1.3.8.2.1. CHRIS Records Search

The California Historical Resources Information System, or CHRIS, is a federation of 11 independent cultural resources data repositories overseen by the California State Office of Historic Preservation. These centers are located around the state, and each holds information about the cultural resources of several surrounding counties. Qualified cultural resources specialists obtain data on known resources from these centers and in turn submit new data from their ongoing research to the centers.

Under BLM's protocol for inventory-level cultural resources investigations on lands for which a Right-of-Way (ROW) grant has been requested, the applicant undertakes a Class I survey. This is a preliminary gathering of data for known sites and other resources from published and unpublished documents, records, files, registers, and other sources, and is intended to produce an analysis and synthesis of all reasonably available data. A Class I survey encompasses prehistoric, historic, and ethnological/sociological elements and essentially chronicles past land uses (BLM 2004, sec. 8110.21).

The Class I survey of the proposed GSEP was intended to compile information on known cultural resources and previously conducted cultural resources studies pertinent to the location of the proposed project location. These records include individual site forms for known archaeological sites and built-environment resources as well as survey and excavation reports from previous investigations. The primary source for the current project is the Eastern Information Center (EIC) of the CHRIS, at the Department of Anthropology, University of California, Riverside. TetraTech asked the staff of the EIC to conduct a literature and records search of the GSEP site footprint and vicinity (Farmer et al. 2009, p. 46). The search covered the areas proposed for the main project components and the linear facilities corridor with a 1.5-mile buffer. In addition, the EIC staff searched the following resources:

- National Register of Historic Places (NHRP);
- California Register of Historical Resources (CRHR);
- California State Historical Landmarks;
- California Points of Historical Interest;
- California Inventory of Historic Resources; and
- BLM cultural Areas of Critical Environmental Concern (ACEC).

C.3.5.1.3.8.2.1.1. CHRIS Results

The CHRIS literature and records search identified 30 previous cultural resources investigations within the search area (Cultural Resources Table 2). This included 22 surveys, 6 literature reviews, 1 set of miscellaneous field notes from the region, and 1 project whose nature is undefined. In their review, EIC staff found that 11 of these overlapped with the GSEP archaeological and built-environment APEs. Parts of three investigations took place on the project site. The first investigation (IC Report No. RI-220) was an intensive linear survey that cut a 123-meter corridor from southeast to northwest through much of the project site. The second investigation (IC Report No. RI-1249) was a sample survey sponsored by the BLM that covered approximately 64 acres or 4 percent of the 1,800-acre project site. The third survey was part of an earlier stage of the GSEP (Farmer et al. 2009). This BLM Class II survey covered a 20 percent random sample of 1,896 acres, including 520 acres within the proposed project site footprint and linear facilities corridor. After these three projects, approximately 68 percent of the project site remained unsurveyed prior to the preparation for the current proposed project. Seven additional surveys, associated with fiber optic lines, geothermal resources, transmission lines, highway improvements, and gas line installation (IC Report Nos. RI-01664, RI-02210, RI-03227, RI-04347, RI-07192, RI-1279, RI-00221), crossed the proposed APE for the GSEP linear alignment. These surveys covered roughly 25 percent of the 90-acre proposed linear facilities corridor (Farmer et al. 2009).

The most extensive previous research in the region was conducted by McCarthy (1993a). He and his volunteers recorded 227 sites along the western flank of the McCoy Mountains. Many of these sites and trails were directly associated with McCoy Spring, an arid-land oasis and major focus of prehistoric use in the region for several millennia. Only two of these sites (trail segments) were included in the CHRIS literature and records search, probably because they are located outside of the GSEP APEs.

In general the previous research in the Chuckwalla Valley suggests that prehistoric archaeological sites are typically located near water (specifically, near springs), on terraces near the shore of the dry lake bed, and in areas where natural resources were utilized. Prehistoric site types in the GSEP site footprint and vicinity include rock shelters, petroglyphs, special use sites, lithic scatters, temporary camps, gathering areas, sacred areas, trails, and isolated finds. Historical archaeological sites in the region are primarily associated with transportation, military maneuvers related to the DTC/C-AMA and Desert Strike, mining, and ranching. Historical archaeological site types for the area include road segments, wells, refuse scatters with domestic and/or military discards, tank tracks, and other isolates.

A total of 85 previously recorded archaeological sites and 117 isolated finds are known for the CHRIS literature and records search area (Cultural Resources Table 2). These figures include the results of the Class II survey. Sixty-eight of these sites were prehistoric sites and 14 were historic-period sites. Site types include:

34 prehistoric small artifact scatters;
31 prehistoric temporary camps;
2 prehistoric trail segments;

1 group of prehistoric rock rings;
11 historic-period refuse scatters;
1 possible historic-period military mound;
1 historic-period well;
1 two-track road;
1 historic-period refuse deposit/lithic scatter;
1 historic-period refuse deposit/temporary camp; and
1 unknown site type

Five of the sites fell within or near the boundary the GSEP APEs, including three sparse lithic scatters and two temporary camps. These sites were identified during the Class II survey. Ninety-three prehistoric isolates were identified including 78 lithics, 5 ceramics, 7 ground stone, 2 isolates with both lithics and ceramics, and 1 unspecified prehistoric artifact. Twenty-four historic-period isolates were identified during the literature search. They included 12 glass isolates, 8 cans, and 4 pieces of metal related to military activity. As is common practice in cultural resources management, staff has eliminated the isolated finds from consideration.

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

IC Report Number	Author	Date	Report Title	Survey Type, Acreage	Distance From APE
RI-00002	M.J. Rogers	1953	Miscellaneous Field Notes, Riverside County, California. Series of handwritten archaeological field notes of various areas within Riverside County.	Several areas in region.	Within region
RI-00010	D.F. McCarthy	1986	A Cultural Resources Assessment of a Proposed Prison Site Near Blythe in Riverside County, California	960 acres	Adjacent
RI-00011	P.J. Wilke	1986	Letter Report: Addendum to "A Cultural Resources Assessment of a Proposed Prison Site Near Blythe in Riverside County, California"	15.15 acres	0.1
RI-00092	T.F. King; G.T. Jefferson; M. Gardner	1973	Archaeological and Paleontological Impact Evaluation: American Telephone and Telegraph Company's Oklahoma City/Los Angeles "A" Cable Route, Between the Colorado River and Corona, California	N/A	0.05
RI-0160	R. Greenwood	1977	Archaeological Resource Survey-West Coast-Mid-Continent Pipeline Project, Long Beach to the Colorado River, Addendum.	11 miles linear survey, 30-meter survey corridor.	Within 2.5 miles
RI-0161	R. Greenwood	1975	Paleontological, Archaeological, Historical, and Cultural Resources-West Coast-Midwest Pipeline Project, Long Beach to the Colorado River.	No survey. Literature review for 235 linear miles, 5-mile-wide corridor.	Within 3 miles

IC Report Number	Author	Date	Report Title	Survey Type, Acreage	Distance From APE
RI-0190	S.R. Haymond	1981	Archaeological Survey Report for the Proposed Safety Project on Interstate Route 10 Between Chiriaco Summit and Wiley's Well Overcrossing, Riverside County, CA.	Intensive Pedestrian Survey, linear survey of over 56 kilometers	Within 1 mile
RI-0220	R. Cowan & K. Wallof	1977	Interim Report—Fieldwork and Data Analysis: Cultural Resource Survey of the Proposed SCE Palo Verde-Devers 500kV Power Transmission Line.	Intensive linear pedestrian survey, 322 kilometers, 123-meter corridor	Within 1 mile
RI-00221	Westec Services, Inc.	1982	Cultural Resource Inventory and National Register Assessment of the Southern California Edison Palo Verde to Devers Transmission Line Corridor (California Portion)	6120 acres	Adjacent and Intersects
RI-00222	K. Wallof; R.A. Cowan	1977	Final Report: Cultural Resource Survey of the Proposed Southern California Edison Palo Verde-Devers 500kv Power Transmission Line	N/A	Adjacent and Intersects
RI-0982	H.L. Crew, J.E. Fitting	1980	An Archaeological Survey of Geothermal Drilling Sites in Riverside County. Science Applications, La Jolla, California.	101 well sites, 30-meter-diameter around each site, intensive pedestrian survey	Within 1 mile
RI-1211	R.H. Crabtree et al.	1980	A Cultural Resources Overview of the Colorado Desert Planning Units	N/A	Regional overview
RI-1249	Various BLM Staff	1978	California Desert Program: Archaeological Sample Unit Records for the Big Maria Planning Unit, BLM. No report, series of BLM California Desert Program Archaeological Sample Unit Record field forms.	Pedestrian intensive survey, sample survey units, sample units 1.6 kilometers linear.	Portions within APE
RI-1279	J.R. Cook and D.S. Cardenas (Principal Investigators)	1981	A Cultural Resource Inventory of the Ford Dry Lake Known Geothermal Resource Area. American Pacific Environmental Consultants, Inc.	Pedestrian sample survey, ~1,600 acres.	Portions within APE
RI-1280	P. Elliott	1981	Draft: Ford Dry Lake Known Geothermal Resource Area Environmental Assessment. BLM.	No survey. Literature review.	Portions within APE
RI-1341	E.W. Ritter	1981	Archaeological Appraisal of the Palen Dry Lake, Area of Critical Concern Environmental Concern, Riverside County, California.	Pedestrian and vehicle survey.	Regional overview, northwest of project area

IC Report Number	Author	Date	Report Title	Survey Type, Acreage	Distance From APE
RI-01664	Westec Services, Inc.	1982	Cultural Resource Inventory of Seisdata Services Chuckwalla Geophysical Test Corridor, Riverside County, California	85.3	Intersects
RI-1973	J.M. Mack	1985	Archaeological Assessment of Six Parcels (Northern, Rocky, Metro, Palen, Ironwood, and Cockrell) Near Palen Dry Lake, Desert Center, California.	Pedestrian survey of approximately 5 square miles.	Within 12 miles
RI-02210	J. Underwood; J. Cleland; C.M. Wood; R. Apple	1986	Preliminary Cultural Resources Survey Report for the US Telecom Fiber Optic Cable Project, From San Timoteo Canyon to Socorro, Texas: The California Segment		Intersects
RI-02897	M. Mitchell	1990	Cultural Resource Assessment of 219 Acres of Public Lands Proposed for Exchange to Newport Harbor Development Corp. Letter Report	219	Partial overlap
RI-3029	J. Rosenthal, R. Conard et al.	1990	Cultural Resources Assessment Southern California Gas Company Proposed Line 5000, Riverside County, California. LSA Associates, Inc.	Linear pedestrian survey, 54 kilometers, 90-meter corridor.	Within 2 miles
RI-03227	C.R. Demcak	1991	An Archaeological Assessment of Tracts 19734 and 19735, Lot #8 in the La Sierra Area of the City of Riverside, California	42	Intersects
RI-3674	D. F. McCarthy	1993	Prehistoric Land Use at McCoy Spring: An Arid-Land Oasis in Eastern Riverside County, California. Thesis paper.	Systematic and intuitive intensive pedestrian survey, approximately 300 acres	Within 9 miles
RI-04082	B.F. Mooney	1990	Wiley Well Road Land Exchange, Cultural Resource Survey	470	0.35
RI-04347	J.A. Keller	1999	A Phase I Cultural Resources Assessment of General Plan Amendment 500, Change of Zone 6468, +/- 50.0 Acres of Land Near Blythe, Riverside County, California	50	Partial overlap
RI-5245	J. Schmidt	2005	Southern California Edison Company Blythe-Eagle Mountain 161 kV Deteriorated Pole Replacement Project, BLM State Permit CA#-04-23 Field Authorization #CA-690-05-FA04.	Pedestrian survey, 40-meter radius around each pole location.	Within 2 miles
RI-5828	W. Raschkow	2001	Project Review and Statistical Summary: Primitive Skills Team-Rehab of Wilderness Area Intrusions, BLM, Palm Springs South Coast Field Office. No report, summary.	Intensive Class III pedestrian survey, 7 acres	Within 2 miles

IC Report Number	Author	Date	Report Title	Survey Type, Acreage	Distance From APE
RI-07192	C. Duke	2002	Cultural Resource Assessment: AT&T Wireless Services, Facility No.06003, Riverside County, California	~0.25	Intersects
RI-07315	W. Bonnery; M. Aislin-Kay	2006	Cultural Resource Records Search and Site Visit Results for T-Mobile Telecommunications Facility Candidate IE24133A (ATC Colo at Wiley Well Rd.) Wiley Well Road and Interstate 10, Desert Center, Riverside County, California	0.25	0.03
N/A	Mooney, Jones & Stokes	2006	Cultural Resource Inventory of the Proposed Blythe Energy Transmission Line Project.	4,072 acres	0.1 to 5+ miles south and east
N/A	Farmer et al. 2009	2009	Class II and Class III Cultural Resources Inventories for the Proposed Genesis Solar Energy Project, Riverside County, California, Final Draft	Class II & III pedestrian survey, 4597.5 acres, 520 in APE	Overlaps with APE

Additional important locations in the region include:

- McCoy Spring National Register District (approximately 5 miles north of the proposed linear facilties corridor at Wiley's Rest Area);
- Palen Dry Lake, BLM cultural Area of Critical Environmental Concern (adjacent);
- Alligator Rock, BLM cultural Area of Critical Environmental Concern (25 miles);
- Camp Young-Desert Training Center, BLM cultural Area of Critical Environmental Concern and State Historical Landmark Riv-985, (marker in Desert Center);
- Colorado River Aqueduct Contractor's General Hospital, State Historical Landmark Riv-922, marker in Desert Center); and
- 1877 Thomas Blythe Canal Intake, State Historical Landmark Riv-948, (marker in Blythe).

C.3.5.1.3.6.2.2. Archival and Library Research

Detailed resource-specific information needed by staff may entail primary and secondary research in various archives and libraries, holding such sources as historic aerial photography, historic maps, city directories, and assessors' records. The applicant may include archival information as part of the information provided to staff in the AFC or may undertake such research to respond to staff's data requests. Staff may also undertake such research to supplement information provided by the applicant.

C.3.5.1.3.6.2.2.1.Archival and Library Research Results

The archaeologists for the applicant conducted additional archival research on the history of the GSEP site footprint and vicinity at the BLM State Office Public Records Room where they obtained copies of General Land Office (GLO) maps and surveyor

field notes (Farmer et al. 2009, p. 46). The results of this research were primarily data for the historical background subsection of the cultural resources section of the AFC. Additional sources of information consulted for the built-environment section (Farmer et al. 2009, app. F, p. 3-1) of the AFC include:

- County of Riverside Transportation Department and Land Management Agency;
- Caltrans Bridge Inventory;
- San Francisco Public Library;
- Los Angeles Public Library;
- BLM Palm Springs/South Coast Field Office;
- American Automobile Association of Southern California's Archives, Los Angeles; and
- On-line maps.

C.3.5.1.3.6.2.3. Local Agency and Organization Consultation

California counties and cities may recognize particular cultural resources as locally historically important by ordinance, in general plans, or by maintaining specific lists. To facilitate the environmental review of their projects, applicants acquire information on locally recognized cultural resources specific to the vicinity of their project by consulting local planning agencies and local historical and archaeological societies.

C.3.5.1.3.6.2.3.1. Results of Inquiries to Local Agencies and Organizations

In order to identify the presence of any locally important cultural resources the archaeologists for the applicant contacted the following organizations by mail or email:

- City of Blythe Planning Department;
- Riverside County Planning Department;
- Coachella Valley Historical Society;
- Coachella Valley Archaeological Society;
- Colorado Desert Archaeology Society;
- George S. Patton Memorial Museum;
- Imperial County Historical Society Pioneers Museum;
- Imperial Valley College Desert Museum;
- Indio Chamber of Commerce;
- Pioneer Historical Society of Riverside;
- Twenty-nine Palms Historical Society; and
- Palo Verde Historical Society and Museum.

The majority of these groups did not respond. The City of Blythe, Coachella Valley Archaeological Society, the Riverside County Planning Department, and the Twenty-

nine Palms Historical Society all reported a lack of important cultural resources within or near the GSEP site footprint and linear facilities corridor and/or a lack of relevant information (Farmer et al. 2009, p. 46). Thus, no additional information on known cultural resources was obtained from these sources.

C.3.5.1.3.6.2.4. Native American Consultation

The Native American Heritage Commission (NAHC) maintains two databases to assist cultural resources specialists in identifying cultural resources of concern to California Native Americans, referred to by staff as Native American ethnographic resources. The NAHC Sacred Lands database has records for places and objects that Native Americans consider sacred or otherwise important, such as cemeteries and gathering places for traditional foods and materials. The NAHC Contacts database has the names and contact information for individuals, representing a group or themselves, who have expressed an interest in being contacted about development projects in specified areas. Both applicants and staff request information from the NAHC on the presence of sacred lands in the vicinity of a proposed project and also request a list of Native Americans to whom inquiries will be made to identify both additional cultural resources and any concerns the Native Americans may have about a proposed project. While the BLM must formally consult, government-to-government, with the federally recognized Native American tribes that have traditional cultural ties to the area in which the project is located, the Energy Commission provides information and sends notices of all public events regarding the project to all Native American groups and individuals whom the NAHC identifies as having an interest in development in the area, whether federally recognized or not.

C.3.5.1.3.6.2.4.1. Results of Native American Consultation

The applicant contacted the NAHC by email on October 17, 2007, in order to obtain information on known cultural resources and traditional cultural properties, and to learn of any concerns Native Americans may have about the GSEP. In addition, they requested a list of Native Americans who have heritage ties to Riverside County and who want to be informed about new development projects there (Farmer et al. 2009, app. E). The NAHC responded on October 19, 2007, with the information that the Sacred Lands File (SLF) database failed to indicate the presence of Native American cultural resources in the immediate GSEP vicinity. The NAHC also forwarded a list of Native American groups or individuals interested in development projects in Riverside County.

On November 26, 2007, the Palm Springs-South Coast Field Office of the BLM sent letters to 28 Native American groups, including those identified by the NAHC, initiating government-to-government consultation for the proposed project. In addition the letter invited comments or concerns regarding potential impacts to cultural resources or areas of traditional cultural importance within the vicinity of the proposed project. On November 23, 2009, an additional letter was sent to the Agua Caliente Band of Indians and informational copies to 12 groups listed in Cultural Resources Table 3, noting the Federal Register publication of the NOI for the proposed project. The letter urged any concerned groups to utilize the Section 106 process to provide comments or specific concerns.

CULTURAL RESOURCES Table 3
Dates of Inquiries Made to Native American Groups and their Replies

Native American Group	Contact Person	Dates of Contact with BLM
Agua Caliente Band of Cahuilla Indians	Richard Milanovitch, Chairman Richard Begay and Patty Tuck, Tribal Historic Preservation Officers	11/26/07 NAHC letter from BLM 01/29/08 Reply from Ms. Tuck 05/20/09 Meeting with BLM 06/05/09 Meeting with BLM 11/23/09 NOI letter from BLM
Ak-Chin Indian Community	Terry Enos, Chairman	11/23/09 Copy of NOI letter
Anza Cahuilla	Contact person unknown	05/20/09 Meeting with BLM 11/05/09 Meeting with BLM
Augustine Band of Cahuilla Mission Indians	Mary Ann Green, Chairperson	11/26/07 NAHC letter from BLM 11/23/09 Copy of NOI letter
Cabazon Band of Mission Indians	John A. James, Chairperson Judy Sapp, Cultural Resources Coordinator	11/26/07 NAHC letter from BLM 12/21/07 Reply from Ms. Sapp 05/20/09 Meeting with BLM 11/05/09 Meeting with BLM 11/23/09 Copy of NOI letter
Cahuilla Band of Indians	Anthony Madrigal, Jr., Chairperson	11/26/07 NAHC letter from BLM 11/23/09 Copy of NOI letter
Chemehuevi Reservation	Charles Wood, Chairperson	11/26/07 NAHC letter from BLM 11/23/09 Copy of NOI letter 12/09/09 Reply
Cocopah Tribal Council	Sherry Cordova, Chairwoman	11/23/09 Copy of NOI letter
Colorado River Indian Reservation	Daniel Eddy, Jr., Chairman Michael Tsosie, Cultural Contact	11/26/07 NAHC letter from BLM 11/23/09 Copy of NOI letter
Fort McDowell Yavapai Nation	Raphael Bear, President	11/23/09 Copy of NOI letter
Fort Mojave Indian Tribe	Timothy Williams, Chairperson Linda Otero, Director, AhaMakav Cultural Soc.	11/23/09 Copy of NOI letter
Gila River Indian Community Council	Richard Narcia, Governor	11/23/09 Copy of NOI letter
Havasupai Tribe	Rex Tilousi, Chairman	11/23/09 Copy of NOI letter
Hualapai Indian Tribe	Charles Vaughn, Chairman	11/23/09 Copy of NOI letter
Kaibab-Paiute Tribe	Carmen Bradley, Chairwoman	11/23/09 Copy of NOI letter
Los Coyotes Band of Indians	Katherine Staubel, Spokesperson	11/23/09 Copy of NOI letter
Morongo Band of Mission Indians	Richard Martin, Chairperson Brit W. Wilson, Cultural Resources	11/26/07 NAHC letter from BLM 05/20/09 Meeting with BLM 11/05/09 Meeting with BLM 11/23/09 Copy of NOI letter
Pechanga Band of Luiseno Indians	Contact person unknown	05/20/09 Meeting with BLM 11/05/09 Meeting with BLM

Native American Group	Contact Person	Dates of Contact with BLM
Quechan Indian Tribe	Michael Jackson, Sr. President Bridget Nash, Cultural Resources	12/18/07 Contact from Ms. Nash 06/23/08 Contact from Ms. Nash 04/29/09 Contact from Ms. Nash 05/21/09 Reports from BLM 05/29/09 Reports from BLM 06/09/09 Contact from Ms. Nash 09/03/09 Letter from Mr. Jackson 11/23/09 Copy of NOI letter 02/16/10 Letter from Mr. Jackson
Ramona Band of Mission Indians	Manuel Hamilton, Chairperson Joseph Hamilton, Vice Chairperson John Gomez, Environmental Coordinator	11/26/07 NAHC letter from BLM 05/21/09 Meeting with BLM 11/05/09 Meeting with BLM 11/23/09 Copy of NOI letter
Salt River Pima-Maricopa Indian Community Council	Joni Ramos, President	11/23/09 Copy of NOI letter
San Manuel Band of Mission Indians	Ann Brierty, Environmental Department	11/26/07 NAHC letter from BLM 05/20/09 Meeting with BLM 11/05/09 Meeting with BLM 11/23/09 Copy of NOI letter
Santa Rosa Band of Mission Indians	John Marcus, Chairman Terry Hughes, Tribal Administrator	11/23/09 Copy of NOI letter
Soboba Band of Mission Indians	Robert Salgado, Chairperson Bennae Calac, Cultural Resources Coordinator	11/23/09 Copy of NOI letter
The Hopi Tribe	Wayne Taylor Jr., Chairman	11/23/09 Copy of NOI letter
Tohono O'oodham Nation	Vivian Saunders, Chairwoman	11/23/09 Copy of NOI letter
Torres-Martinez Desert Cahuilla Indians	Raymond Torres, Tribal Administrator William J. Contreras, Cultural Resources Coordinator	11/26/07 NAHC letter from BLM 05/20/09 Meeting with BLM 11/05/09 Meeting with BLM 11/23/09 Copy of NOI letter
Twenty-nine Palms Band of Mission Indians	Mike Darrell, Chairperson	11/26/07 NAHC letter from BLM 05/20/09 Meeting with BLM 11/05/09 Meeting with BLM 11/23/09 Copy of NOI letter
Yavapai-Apache Nation	Jamie Fuller, Chairman	11/23/09 Copy of NOI letter
Yavapai-Prescott Indian Tribe	Ernie Jones, Sr., President	11/23/09 Copy of NOI letter

Tetra Tech reports that no responses to the initial 2007 BLM letter were received by the time the final draft of the cultural resources technical report was included in the AFC in November 2009 (Farmer et al. 2009, app. E). However the BLM reports a number of contacts and meetings between November, 2007, and December, 2009. The details of these contacts are listed in Cultural Resources Tables 4 and 5. A number of tribes—Agua Caliente Band of Cahuilla Indians, Morongo Band of Mission Indians, Cabazon Band of Mission Indians, Torres-Martinez Desert Cahuilla Indians, Pechanga Band of Luiseño Indians, Anza Cahuilla, Ramona Band of Mission Indians, Twentynine Palms

Band of Mission Indians, and San Mañuel Band of Mission Indians—attended meetings with BLM staff about various solar energy and transmission line projects in the region. In general the tribes expressed concern over possible damage to cultural resources, cultural landscapes, and traditional cultural properties. In addition they expressed interest in receiving copies of archaeological reports after cultural resources surveys of the GSEP footprint and linear facilities corridors were complete and being informed about the amount of damage to these resources expected to take place. It is unclear which of these groups is specifically interested in GSEP, other than the three tribes discussed below.

Four tribes—the Quechan Tribe, the Agua Caliente Band of Cahuilla Indians, the Cabazon Band of Mission Indians, and the Chemehuevi Reservation—responded to BLM letters about GSEP. The Agua Caliente Band of Cahuilla Indians are not interested in consulting about GSEP as it is outside of tribal traditional use areas. The Cabazon Band of Mission Indians and the Chemehuevi Reservation expressed general concerns about the potential destruction of cultural resources and traditional cultural properties.

The Quechan Tribe has expressed the most interest in GSEP, and has contacted BLM multiple times. Their concerns have been summarized in a formal letter written in response to the proposed Programmatic Environmental Impact Statement for Solar Energy Development for the six southwestern states. In this letter they consider the area around Blythe, presumably including the GSEP site footprint and linear facilities corridor, to be part of the Quechan Tribe's traditional land. To alleviate potential impacts to cultural resources, spiritual landscapes, or traditional cultural properties (TCPs) they request to be consulted at the inception of the project, prior to any plans being finalized. They further request that the clustering of these large several thousand-acre projects be prohibited, that traditional areas rich in cultural resources be avoided, that projects be placed on land that has already been disturbed, and that existing buildings be favored over undisturbed land for the placement of solar panels. Finally, they emphasize their concern over indirect as well as direct impacts to cultural resources. They request that BLM not "focus exclusively on archaeological site impacts, while failing to fully address impacts to resources such as cultural landscapes and TCPs" (Jackson 2009, p. 3). An additional letter from the Quechan Tribe was sent on February 16, 2010. In this letter President Jackson expresses doubt that the appropriate Section 106 consultation process can be completed within the "fast-track" timeframe that requires a final record-of-decision by September 2010. He further comments that the Tribe does not believe that the "fast-track" projects meet the regulatory criteria for the use of a programmatic agreement.

CAlifornians for Renewable Energy (CARE) members favor a "no action" alternative. Among their concerns are several related to cultural resources. Alfredo Acosta Figueroa, a CARE member and member of the La Cuna de Aztlan Sacred Sites Protection Circle notes that the proposed project will "despoil a portion of the desert wilderness" (CARE 2009a, p. 2), which is sacred to the Uto-Aztecan language speakers. Further, he mentions that solar energy projects in general are "antithetical to the sacred sites purpose and appear to be intended to essentially trap the Creator Quetzalcoatl as the deity descends at sun down" (CARE 2009a, p. 2). In particular CARE is concerned about damage to sacred petroglyph sites—one in the Palen Mountains and another at McCoy Spring National Register District—and the ancient

trails that run between them. Knowledge of these sites is part of local traditional knowledge and has also been documented by archaeologists including Johnson and Johnstone (1957). According to the descriptions provided by Mr. Figueroa and by the archaeological maps, portions of several prehistoric trails potentially associated with McCoy Spring National Register District appear to pass near to or through the GSEP site footprint and linear facility corridor (McCarthy 1993, Fig. 10).

CULTURAL RESOURCES Table 4
Details of Communication between BLM and Native American Groups

Date	Group	Communication Details
12/18/07	Quechan Tribe	Bridget Nash replied: Expressed concerns for the potential impacts affiliated with the Tribe. Requests a copy of the cultural report once it is completed.
12/21/07	Cabazon Band of Mission Indians	Judy Sapp replied: If there are substantial impacts, the Tribe will request an in-person meeting with Morongo Tribal Historian and BLM staff. She requested additional cultural resource information and for the BLM to provide a report when it becomes available.
01/29/08	Agua Caliente Band of Cahuilla Indians	Patty Tuck replied: The project is beyond both the Reservation lands and traditional use areas of the Tribe. Suggests contacting the Augustine Band of Cahuilla Indians, the Cabazon Band of Mission Indians, the Twentynine Palms Band of Mission Indians, and the Torres-Martinez Desert Cahuilla Indians.
06/23/08	Quechan Tribe	Bridget Nash requests archaeological reports.
04/29/09	Quechan Tribe	A telephone and e-mail conversation between Bridget Nash (Quechan Tribe) and Wanda Raschkow (BLM); Ms. Nash sends requested reports and Ms. Raschkow sends e-mail regarding project status.
05/20/09	Multiple Tribes	A meeting was held to discuss various solar energy projects and transmission lines in the Chuckwalla and Coachella Valleys. Attendees included BLM staff C. Dalu, R. Queen, and J. Kalish and representatives from the Agua Caliente Band of Cahuilla Indians, Morongo Band of Mission Indians, Cabazon Band of Mission Indians, Torres-Martinez Desert Cahuilla Indians, Pechanga Band of Luiseno Indians, Anza Cahuilla, Ramona Band of Mission Indians, Twentynine Palms Band of Mission Indians, and San Manuel Band of Mission Indians.
05/21/09	Quechan Tribe	A letter was posted to Ms. Nash (Quechan Tribe) from BLM Palm Springs Field Office providing requested reports. C. Dalu sent Tetra Tech's archaeology reports.
05/29/09	Quechan Tribe	A package was posted to Ms. Nash (Quechan Tribe) from BLM Palm Springs Field Office providing requested reports.

Date	Group	Communication Details
06/05/09	Agua Caliente Band of Cahuilla Indians	Meeting with BLM and representatives of the Agua Caliente Band of Cahuilla Indians to discuss various solar projects.
06/09/09	Quechan Tribe	A telephone conversation between Bridget Nash (Quechan Tribe) and Wanda Raschkow (BLM); Ms. Raschkow reports status of project. Ms. Nash requests report. Ms. Raschkow indicates that a data sharing agreement will be necessary before providing archaeological reports and other sensitive data.
11/05/09	Multiple Tribes	Meeting with BLM to discuss various solar projects. Attendees included BLM staff and representatives from the Agua Caliente Band of Cahuilla Indians, Morongo Band of Mission Indians, Cabazon Band of Mission Indians, Torres-Martinez Desert Cahuilla Indians, Pechanga Band of Luiseno Indians, Anza Cahuilla, Ramona Band of Mission Indians, Twentynine Palms Band of Mission Indians, and San Manuel Band of Mission Indians. Tribes request a monthly report regarding all projects. The Agua Caliente Band of Cahuilla Indians requests a site visit.
09/03/09	Quechan Tribe	BLM receives a letter from President Mike Jackson, Sr. commenting on the Programmatic Environmental Impact Statement regarding solar development being developed for the six southwestern states. Concerns expressed over cultural resources and traditional cultural properties.
12/09/09	Chemehuevi Reservation	A telephone conversation between C. Dalu and a representative of the Chemehuevi Reservation expressing concern about the effect of Genesis, Palen, and Blythe solar projects on cultural resources and traditional cultural properties.
12/23/09	La Cuna de Aztlan Sacred Sites Protection Circle	This is a group composed of members from multiple tribes dedicated to the protection of sacred sites in traditional territories in the Colorado and Mojave Deserts. Their comments were included in a formal letter from the CAlifornians for Renewable Energy (CARE) in response to the BLM/CEC request for comments on the GSEP NOI. Concerned about damage to cultural resources such as trails and springs, in particular McCoy Spring.
02/16/10	Quechan Tribe	BLM receives a letter from President Mike Jackson, Sr. commenting on the regulatory approval schedule for the solar “fast-track” projects including Genesis. Concerns expressed about the ability of BLM to consult appropriately with the Tribe in the time frame envisioned. Also suggests that a Section 106 PA is inappropriate for these projects.

C.3.5.1.3.6.3. Field Inventory Investigations

To facilitate the environmental review of their projects, applicants conduct surveys to identify previously unrecorded cultural resources in or near the GSEP site footprint and linear facilities corridor. These surveys include a pedestrian archaeological survey and a built-environment windshield survey. The applicant includes the acquired new survey information as part of the information provided to staff in the AFC and may undertake additional field research, including geoarchaeological studies and site testing, to respond to staff's data requests. Staff may also undertake additional field research to supplement information provided by the applicant.

BLM's Class I survey, mentioned above, is an archival exercise. Under BLM's protocol for inventory-level cultural resources investigations on lands for which a Right-of-Way grant has been requested, after the Class I survey, the applicant generally undertakes field research, sequentially, at two increasing levels of intensity. A Class II survey, sometimes referred to as a "reconnaissance survey," is a statistically based sample survey designed to help characterize the probable density, diversity, and distribution of archaeological sites in a large area by interpreting the results of surveying (walking across and examining the ground surface) limited and discontinuous portions of the target area. A Class III survey is a continuous, intensive survey of an entire target area, aimed at locating and recording all archaeological properties that have surface indications, by walking close-interval parallel transects until the area has been thoroughly examined (BLM 2004, sec. 8110.21).

In summary, the archaeologists for the applicant employed six phases of fieldwork to inventory the cultural resources in the GSEP site footprint and linear facilities corridor: 2 geoarchaeological studies, 3 intensive pedestrian surveys, and 1 built-environment survey (Cultural Resources Table 2). This fieldwork identified 110 new cultural resources. The present cumulative cultural resources inventory for the GSEP site footprint and linear facilities corridor includes 33 archaeological resources, 75 archaeological isolate resources, 1 possible ethnographic resource, and 2 linear built-environment resources. These totals do not include the Class II survey.

C.3.5.1.3.6.3.1. Results of Pedestrian Archaeological Survey

The archaeologists for the applicant (Tetra Tech) undertook three distinct intensive pedestrian archaeological surveys of the proposed GSEP site footprint and linear facilities corridor and shortly will undertake a fourth.

The initial survey was a BLM Class II Sampling Field Inventory, which was conducted to facilitate decision-making regarding the placement of the project footprint. The results of this survey were included in the "CHRIS Results" subsection because this information helped inform the boundaries of the Class III survey area. During the Class II survey 20 percent of the original GSEP site footprint (9,480 acres) was surveyed. To identify locations to survey, this area was divided into 40-acre parcels along eighth-section lines. Forty-eight 40-acre parcels were then randomly selected from a total sample universe of 237 using a random numbers table. In total, 1,896 acres were surveyed. The field work was conducted between November, 2007, and January, 2008.

The second survey was an intensive BLM Class III survey of the 2,494-acre proposed project facility plus a perimeter buffer of 200 feet. The field work was conducted between March and April, 2009. Sites that had been recorded in this area during the initial Class II survey were briefly revisited during the Class III survey and updated if necessary.

The third pedestrian survey was an intensive BLM Class III survey of the proposed linear facilities corridor. Survey coverage included the proposed linear alignment, plus 75 feet to either side of the center line of the routes. A total of 449.5 acres were surveyed. The fieldwork was conducted in June of 2009.

The fourth pedestrian survey will be an intensive BLM Class III survey of a second proposed linear facilities corridor. Survey coverage will include the proposed linear facilities corridor, plus 75 feet to either side of the center line of the routes. The number of acres included in this survey is undetermined at this time, but is expected to be similar in size to the previous linear survey (approximately 450 acres). The field work will be completed in February of 2010.

The three completed surveys used identical methods and encountered similar working conditions. The survey methods entailed two-to ten-person survey teams walking at 15-meter intervals looking for archaeological remains. The survey team sought to relocate previously recorded sites and assess their current condition. For new resources, they defined three or more artifacts and/or features as a site and two or fewer as an isolate. They used an arbitrary distance of 50 meters (m) between artifacts and features to separate deposits into individual sites. They used handheld GPS units to plot the locations of features, sites, and isolated artifacts. All sites and architectural resources over 45 years of age with the data required by Department of Parks and Recreation (DPR) series 523 forms. They photographed site overviews and diagnostic artifacts, drew site sketch maps, compiled artifact and feature descriptions, and made observations on the terrain and ecology. Once a site was recorded the team removed all flagging tape. Overall visibility with all of the surveyed areas was good, and work days were sunny and clear with occasional days with extremely high winds. Tetra Tech undertook no subsurface testing and collected no artifacts (Farmer et al. 2009, pp. 58–59).

During the second and third intensive pedestrian archaeological surveys, 33 new archaeological sites and 75 archaeological isolates were found (Farmer et al. 2009). This total only includes sites found in the proposed project facility and linear facilities corridor areas. Sites found in the original, larger, 9,480-acre site footprint, are discussed in the “CHRIS Results” subsection above. When the fourth survey is complete, the results will be added to the above total. The new archaeological sites consisted of 23 prehistoric, 8 historic-period, and 2 multi-component archaeological sites. The archaeological isolates consisted of 53 prehistoric items, primarily lithics, and some ground stone. Twenty-two historic-period isolates were identified, mainly glass and metal. The prehistoric archaeological site types include lithic scatters of stone tool manufacturing and maintenance debris and potential temporary campsites. The historical archaeological site types consist of debris and refuse scatters. Many appear to be temporary camps associated with Desert Training Center California-Arizona Maneuver Area (DTC/C-AMA) maneuvers. The isolate types include prehistoric lithics

and ceramics as well as historic-period refuse. Cultural Resources Table 5 summarizes the previously known and newly identified archaeological sites. In many cases, however, for the newly identified sites, site function and the time periods represented were unspecified, despite the presence of artifacts that could provide the relevant information. This was particularly the case for the historical archaeological sites. These issues were not resolved by Data Requests.

C.3.5.1.3.6.3.2. Results of Geoarchaeological Investigations

The consultant for the applicant provided two geomorphological reports that summarize the geomorphology of the GSEP site footprint and linear facilities corridor on the basis of the extant geologic and soil science data for the region (Farmer et al. 2009, app. C) as well as field explorations (TTEC 2010e). As discussed in the "Geomorphology" subsection, above, six sedimentary units were identified during these investigations. The preliminary assessment for archaeological sensitivity of each of these units is presented below.

Qw:

These active stream wash deposits have a moderate potential for containing buried archaeological artifacts. However, the moderate-to-high-energy movement of water through these sediments would not be conducive to the preservation of archaeological materials and the spatial associations among them.

Qs:

These late Holocene-age, wind-deposited sand sheets are most commonly found to the south of the proposed GSEP site footprint often overlaying lake deposits (Ql). Staff considers this stratigraphic unit to have a moderate-to-high potential for containing buried archaeological deposits associated with human utilization of resources associated with Dry Ford Lake. Relatively low-energy alluvial and aeolian movement of sediments would be conducive to the preservation of archaeological materials and the spatial associations among them. Poorer preservation of these spatial associations is expected in sites located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash.

Qal:

This alluvium was deposited across most of the GSEP site footprint between 1,000 and 8,000 years ago, well within the human occupation of the region. This approximately 1-foot-thick layer was laid down by low-to-moderate-energy sheet wash and flood events. It is often covered by sand sheets 4 to 8 inches thick (Qsr). Staff considers this stratigraphic unit to have a moderate –to-high potential for containing buried deposits. The potential for buried deposits is expected to increase with proximity to the lake. Deposits formed by low- and moderate-energy sheet wash would be conducive to the preservation of archaeological materials and the spatial associations among them. Poorer preservation of these spatial associations is expected in sites located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash.

Qsr:

These ancient sand sheets were deposited between 1,000 to 7,000 years ago, within the human occupation of the region. This stratigraphic unit is common on the surface of the site footprint overlaying unit Qal in a layer 4 to 8 inches thick. Staff considers this stratigraphic unit to have a moderate-to-high potential for containing buried deposits. The potential for buried deposits is expected to increase with proximity to the lake. Relatively low-energy alluvial and aeolian movement of sediments would be conducive to the preservation of archaeological materials and the spatial associations among them. Poorer preservation of these spatial associations is expected in sites located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash.

Qoaf:

These distinctly red Pleistocene alluvial fan deposits were created between 12,000 and 20,000 years ago. They are present within 1 to 2 feet of the modern ground surface across most of the proposed GSEP site footprint. Staff considers this stratigraphic unit to have a low to moderate potential for archaeological materials on its upper surface. Because these deposits were formed prior to the human occupation of the region, the potential for containing buried cultural materials is considered low. The low-to-moderate-energy sheet wash and flood events on the surface of this stratigraphic unit would be moderately conducive to the preservation of archaeological materials and the spatial associations among them. Poorer preservation of these spatial associations is expected in sites located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash.

Ql:

This stratigraphic unit can be divided into two distinct groups, those deposited above the Qoaf alluvium and those deposited below the Qoaf alluvium. The lake deposits below the Qoaf alluvium were formed more than 12,000 years ago, prior to the human occupation of the area. As a result staff does not expect these lake sediments to contain cultural materials. Lake deposits above the Qoaf alluvium were formed during the human occupation of the area (Holocene period) and may contain cultural materials on the surface or buried by other lake deposits, Qal alluvium, or Qs sand dunes. Relatively low-energy alluvial movement of sediments would be conducive to the preservation of archaeological materials and the spatial associations among them. Poorer preservation of these spatial associations is expected in sites located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash. Preservation may also be poor due to high-energy wave action along eastern shoreline as a result of strong winds from the west.

Several of the ancient shorelines have been associated with estimated dates, potentially giving clues to the ages of the sites that cluster along their edges. One of the latest Holocene shorelines is located at 373 and 374 feet in elevation and is estimated to be 12,000 years old. The shoreline between 367 and 370 feet in elevation appears to be between 8000 and 12,000 years old, and the shoreline at 364 feet is estimated to be between 5000 and 12,000 years old. The most recent shoreline is located at 360 feet and appears to have been created during the past few thousand years.

Overall, the majority of the proposed site footprint is covered in deposits of Holocene age. Staff considers these deposits to have a moderate-to-high potential to contain well-preserved, buried cultural materials. However, these materials would be expected within approximately 2 feet of the modern ground surface, in sediments stratigraphically above the Qoaf alluvium. The potential for artifacts within the Qoaf alluvial deposits, in consideration of the apparent Pleistocene age of those deposits, is considered slight. The highest density of sites is expected in association with ancient lakeshores reflecting human utilization of plant and animal resources flourishing near this desert water source. These sites are also expected to be the best preserved since the gentle slope would result in low-energy sheet wash. The exception is those sites located in the McCoy-Palen Mountain valley, where moderate-energy sheet wash may have caused disturbance and potentially more deeply buried sites. Some of these sites may be dated by their association with particular shorelines. These patterns indicate that the areas of highest archaeological sensitivity are located in the southeastern part of the GSEP site footprint.

C.3.5.1.3.6.3.3. Results of Windshield Survey for Built-Environment Resources

The applicant also sought to identify standing structures that would be 45 years of age or older in 2010 (Farmer et al. 2009, app. F). The built-environment inventory covered the APE of the linear facilities and a 0.5-mile survey buffer. In consultation with Energy Commission staff, it was determined that a built-environment survey was not required for the plant facility APE since no historical architectural resources were identified within several miles of the site footprint. Fieldwork was conducted in July of 2009, resulting in the identification of two linear built-environment resources along the proposed linear facilities corridor. The historian for the applicant identified and recorded portions of the Blythe-Eagle Mountain Transmission Line and Wiley's Well Road within the built-environment study area, but did not evaluate them for their eligibility to be listed on the NRHP or CRHR.

C.3.5.1.3.6.4. Summary of Identified Cultural Resources in the APEs and Vicinity

Overall, previous projects and the cultural resources surveys of the applicant have identified a total of 313 cultural resources within the APEs and in the near vicinity (Cultural Resources Table 5). These resources include 118 archaeological sites, 192 archaeological isolates, 1 possible ethnographic resource, and 2 linear built-environment resources. One of these sites is of an unspecified type and from an unspecified time period and is therefore not included in the following discussion.

The prehistoric resources include 91 archaeological sites, with 4 additional multi-component sites containing prehistoric components, and 146 isolated artifacts. These sites primarily consist of sparse artifact scatters and possible temporary campsites. The sparse artifact scatters are primarily prehistoric flakes and cores. These tend to blend into the prehistoric isolates, which are also predominantly lithics, forming a landscape with regular but diffuse evidence of prehistoric human activities. These activities appear to be related to stone tool manufacturing and maintenance, possibly tied to the collection of wild resources. Ethnographic sources suggest that portions of the Mojave Desert distant from water sources were primarily used for travel and ritual activities rather than for the collection of resources (Cleland 2005).

Interestingly, travel-related sites were not present in the proposed site footprint and linear facilities corridor, and are rare in the project vicinity. Ethnographic sources and other archaeological projects in the region mention prehistoric trails leading to McCoy Spring National Historic District, at least four other natural “tanks” within the McCoy Mountains, and along the I-10 corridor (Johnson and Johnstone 1957; McCarthy 1993). Road construction in this corridor may well have destroyed evidence of the prehistoric trail that preceded the modern transportation routes and associated natural gas and electric lines. McCarthy’s (1993) work at McCoy Spring suggests that prehistoric trails potentially crossed the proposed site footprint and linear facilities corridor. However, these trails are easiest to see on landforms with desert pavement, which are rare in the GSEP site footprint. Linear alignments of deliberate “pot drops” (isolated scatters of sherds from a single pot, possibly associated with sacred activity) (Sutton et al. 2007) and artifact scatters consisting of only ceramics (McCarthy 1993) are both indications of nearby trails. Clear evidence of trails was not identified in the GSEP site footprint, its linear facilities corridor, or its vicinity. However, secondary indications, such as pot drops, were found during archaeological survey, and multiple recorded trails run in the direction of the GSEP site footprint (McCarthy 1993, Fig. 10).

Through its analysis, staff believes the trails and trail-associated sites described above contribute to the Prehistoric Trails Network (PTN) Cultural Landscape, a potentially NRHP- and CRHR-eligible cultural landscape whose boundaries have yet to be determined but which includes McCoy Spring, Ford Dry Lake, and the trails leading between them and other important destinations, such as the Colorado River.

Sites with features and the densest concentrations of artifacts appear to be located around the edges of Ford Dry Lake. Most archaeologists have referred to these as temporary camps. Clearly this would have been an attractive place to camp when traveling, an excellent place to collect resources when water was temporarily present, and a possible permanent village location when water was present for long periods. The lack of midden on the surface of any of the recorded sites suggests that these sites had short-term, resource-gathering, resource-processing, and residential functions. As many of these sites have ground stone, the temporary camps appear to date after the Paleo-Indian period. Further, most of the sites also have ceramics, suggesting that they have components from the Late Prehistoric period (Sutton et al. 2007). These lakeside camps are also possible contributors to the PTN Cultural Landscape.

The historic-period resources include 22 archaeological sites, with 4 additional multi-component sites containing historic-period components, and 46 isolated artifacts. Most of these sites and artifacts reflect movement through the area by automobile and military maneuvers associated with the DTC/C-AMA. These sites are primarily debris scatters. Some are mainly domestic debris and may have been dumped by passing travelers or off-road vehicle drivers. Others are a mix of domestic military debris, suggesting they are the remains of temporary military camps that were part of the DTC/C-AMA. Occasional military features such as earthen mounds and possible foxholes have also been noted. The historic-period isolates reflect these same kinds of activities. Other known, common historic activities, including mining and ranching, are not well represented.

Through its analysis, staff believes the World War II-Era DTC/C-AMA sites described above contribute to a potentially eligible cultural landscape (historic district) whose boundaries include the entire proposed GSEP's APEs.

Only one possible ethnographic resource was identified, McCoy Spring National Register District. This site was originally nominated to the NRHP for its archaeological information potential. However, it appears to be an important place to local Native American groups, as discussed in "Results of Native American Consultation" (CARE 2009a). While the site would not be physically impacted by the GSEP, indirect impacts related to the proposed project may be possible.

Two linear built-environment resources were identified within the proposed linear facilities corridor: Blythe-Eagle Mountain Transmission Line and Wiley's Well Road. The transmission line is associated with regional population growth during the 1950s. Wiley's Well Road is associated with transportation and regional mining efforts, beginning in the 1860s and continuing until the 1960s.

CULTURAL RESOURCES Table 5
Cultural Resources Located in the Vicinity of the Proposed Project

Resource Type and Designation	Known Resource Description (type, age, content)	When Found	Period/ Era	Information Source
Prehistoric Archaeological Resources				
P-33-1517	Prehistoric Site: Small Lithic Scatter of jasper and quartz at 120 meters elevation.	Previously known	Prehistoric	E. Ritter 1975
CA-Riv-53T	Prehistoric Trail segment with ceramic distribution along trail.	Previously known	Prehistoric	McCarthy 1993
P-33-1222	Prehistoric Site: Temporary Camp located near dry lake shore: 7 loci of metates/manos, also few quartz/chalcedony cores/flakes. Site disturbed by ORV.	Previously known	Late Prehistoric	J. Cook 1976
P-33-1516	Prehistoric Site: Large Temporary Camp along dry lake shoreline: ground stone, lithic scatter, thermal fractured rock. Some WW II military artifacts noted, no details regarding type.	Previously known	Late Prehistoric Also historic	E. Ritter 1975
P-33-2159	Prehistoric Site: Temporary Camp/Lithic Scatter along gravel terraces of dry lake bed: metate/manos fragments, hammerstone/choppers, lithic flakes; rhyolite, basalt, chalcedony, agate, jasper, chert, granite, andesite.	Previously known	Late Prehistoric	S. Cardenas 1981

Resource Type and Designation	Known Resource Description (type, age, content)	When Found	Period/ Era	Information Source
P-33-1216	Prehistoric Site: Widely dispersed lithic scatter along maximal shoreline upon the gravel terrace: 7 flakes of chert/jasper, 1 hammerstone/core. Potential Pinto/Amargosan period site.	Previously known	Prehistoric	D. McCarthy 1977
CA-Riv-6170 (P-33-8655)	Prehistoric Site: Lithic Scatter along dry lake bed: lithic flakes of quartzite, agate, chalcedony, chert, jasper, 1 chert rose spring project point, 1 point and drill fragment.	Previously known	Late Prehistoric	M. Mitchell 1998
P-33-663	Prehistoric Site: An extensive series of shoreline temporary camps: metate/mano fragments of green shale, fire affected rock, lithic reduction flakes (jasper, quartzite, rhyolite, chert, and chalcedony), pottery (Parker buff ware and Tizon brown ware, and greyware), rock alignment, 1 corner notched projectile point fragment, 1 biface fragment.	Previously known	Late Prehistoric	D. Pallette et al., 1989
P-33-2206	Prehistoric Site: Sparse Lithic Scatter: 6 flakes (chalcedony, quartz, opal), 1 quartzite cobble core.	Previously known	Prehistoric	S. Hammond 1981
P-33-2157	Prehistoric Site: Temporary Camp near dry lake shore: ceramic (buff/brown ware), ground stone fragments (metates/manos), lithic flakes (quartz/green andesitic meta-volcanic).	Previously known	Late Prehistoric	S. Cardenas 1981
P-33-1543	Prehistoric Site: Lithic Scatter (temporary camp): 3 metate fragments-2 flakes.	Previously known	Late prehistoric	M. Morim 1976
P-33-3802	Prehistoric Site: Temporary Camp near dry lake shore: 1 metate fragment, 2 chalcedony flakes, 1 quartzite hammerstone, fractured cobbles, and possible green shale hearth feature.	Previously known	Late Prehistoric	D. Pallete et al. 1989
P-33-1131	Prehistoric Site: Widely dispersed low density ceramic drop: 50 reddish brown “Tizon” pottery shreds, 1 mano/core fragment.	Previously known	Late Prehistoric	E. Dittman 1981
P33-00260	Prehistoric Site: Lithic Scatter (temporary camp): metate fragments, flakes.	Previously known	Late Prehistoric	R. Rameriz 2008 (update)

Resource Type and Designation	Known Resource Description (type, age, content)	When Found	Period/ Era	Information Source
P33-00663	Prehistoric Site: Widely dispersed lithics, ground stone, pottery.	Previously known	Late Prehistoric	D. Pallette 1989
P33-001543	Prehistoric Site: 3 metates, lithic flakes	Previously known	Late Prehistoric	M. Morim 1976
P33-001818	Prehistoric pottery fragments	Previously known	Late Prehistoric	R. Carrico 1980
P33-001840	Prehistoric lithic scatter.	Previously known	Prehistoric	Musser/Boyer 1976
P33-2159	Prehistoric Site: Temporary Camp/Lithic Scatter along gravel terraces of dry lake bed: metate/manos fragments, hammerstone/choppers, lithic flakes; rhyolite, basalt, chalcedony, agate, jasper, chert, granite, andesite.	Previously known	Late Prehistoric	Cardenas 1981
P33-3801	Prehistoric site: pottery scatter	Previously known	Late Prehistoric	Pallette 1989
P33-003802	Prehistoric Site: lithic scatter, lithic tools, and ground stone	Previously known	Late Prehistoric	Pallette 1989
P33-003808	Prehistoric Site: ceramic scatter	Previously known	Late Prehistoric	Mooney & Associates 1990
P33-003809	Prehistoric Site: ceramic scatter	Previously known	Late Prehistoric	Mooney & Associates 1990
CA-Riv-6900	Prehistoric Site: lithic scatter, lithic tools, and ground stone	Previously known	Prehistoric	BLM 1977
P-33-1517	Prehistoric Site: Small Lithic Scatter of jasper and quartz at 120 meters elevation.	Previously known	Prehistoric	E. Ritter 1975
P-33-3129	Trail segment that leads to the southwestern side of the McCoy Mountains.	Previously known	Prehistoric	F. McCarthy 1991
P33-00259	Rock Rings	Previously known	Prehistoric	N. Gester 1965
CA-Riv-9032 (P33-17416)	Lithic Scatter: Debitage (n=14); two cores.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9033 (P33-17417)	Lithic Scatter: Debitage (n=39); two cores.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9034 (P33-17418)	Temporary Camp: Debitage (n=55); mano fragment.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9036 (P33-17420)	Temporary Camp: Debitage (n=3), mano, fire-affected rock (FAR).	New	Prehistoric	Farmer et al. 2009
CA-Riv-9037 (P33-17421)	Temporary Camp: Debitage (n=17), ground stone, ceramics, fire-affected rock (FAR).	New	Prehistoric	Farmer et al. 2009
CA-Riv-9038 (P33-17422)	Temporary Camp: Debitage (n=7), FAR.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9039 (P33-17423)	Temporary Camp: Debitage (n=3), and mano fragment.	New	Prehistoric	Farmer et al. 2009

Resource Type and Designation	Known Resource Description (type, age, content)	When Found	Period/ Era	Information Source
CA-Riv-9040 (P33-17424)	Lithic Scatter: Debitage (n=22), and flake tool.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9041 (P33-17425)	Lithic Scatter: Debitage (n=11), and core.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9042 (P33-17426)	Lithic Scatter: Debitage (n=2), core.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9043 (P33-17427)	Temporary Camp: Debitage (n=7), a lithic core, and ground stone implements. Speculative chronology.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9044 (P33-17428)	Temporary Camp: Debitage (n=20+), and mano.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9045 (P33-17429)	Lithic Scatter: Debitage (n=4), and cores.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9046 (P33-17430)	Lithic Scatter: Debitage (n=16); FAR, core, hammerstone, mano, metate fragment.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9047 (P33-17431)	Lithic Scatter: Debitage (n=5)	New	Prehistoric	Farmer et al. 2009
CA-Riv-9048 (P33-17432)	Lithic Scatter: Debitage (n=10).	New	Prehistoric	Farmer et al. 2009
CA-Riv-9049 (P33-17433)	Temporary Camp: Debitage (n=2), core, and ground stone fragments.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9050 (P33-17434)	Lithic Scatter: Debitage (n=3).	New	Prehistoric	Farmer et al. 2009
CA-Riv-9051 P33-17435	Lithic Scatter: Debitage (n=4), core.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9052 (P33-17436)	Temporary Camp: Debitage (n=2), core, and ground stone].	New	Prehistoric	Farmer et al. 2009
CA-Riv-9053 (P33-17437)	Lithic Scatter: Debitage (n=3), and cores.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9054 (P33-17438)	Lithic Scatter: Debitage (n=5).	New	Prehistoric	Farmer et al. 2009
CA-Riv-9055 (P33-17439)	Temporary Camp: Debitage, ground stone, and ceramic fragments.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9056 (P33-17440)	Lithic Scatter: Debitage (n=3), biface, and hammerstone.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9057 (P33-17441)	Temporary Camp: Debitage (n=6), core, and metate fragment.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9060 (P33-17444)	Temporary Camp: Debitage (n=4), metate and ceramic fragments.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9061 (P33-17445)	Lithic Scatter: Debitage (n=6).	New	Prehistoric	Farmer et al. 2009
CA-Riv-9062 (P33-17446)	Temporary Camp: Debitage (n=16) and mano fragments.	New	Prehistoric	Farmer et al. 2009

Resource Type and Designation	Known Resource Description (type, age, content)	When Found	Period/ Era	Information Source
CA-Riv-9064 (P33-17448)	Temporary Camp: Debitage (n=120+), projectile points, bifaces, and ground stone implements. Speculative chronology. Possibly Archaic period.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9065 (P33-17449)	Temporary Camp: 20+ FAR, 2 metate fragments, and 2 chert flakes.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9066 (P33-17450)	Lithic Scatter: Debitage (n=8).	New	Prehistoric	Farmer et al. 2009
CA-Riv-9067 (P33-17451)	Lithic Scatter: Debitage (n=20+), projectile point, biface, flake tool.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9068 (P33-17452)	Temporary Camp: Debitage (n=50+), ground stone, and a flake tool.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9069 (P33-17453)	Lithic Scatter: Debitage (n=10+).	New	Prehistoric	Farmer et al. 2009
CA-Riv-9070 (P33-17454)	Lithic Scatter: Debitage (n=2), core.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9071 (P33-17455)	Temporary Camp: Debitage (n=235+), with associated bifaces, tools and cores, indications of food production (milling stones, possible FAR), and evidence of ceramic technology. Late Prehistoric Period.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9072 (P33-17456)	Temporary Camp: Debitage (n=hundreds), FAR, Rose Spring projectile point, brownware sherds (n=hundreds) hundreds of ground stone fragments, scatter covers several hundred acres.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9073 (P33-17457)	Lithic scatter: Three flakes and one tool.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9075 (P33-17459)	Temporary Camp: Debitage (n=5), a flake tool, and metate.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9076 (P33-17460)	Temporary Camp: Debitage (n=5).	New	Prehistoric	Farmer et al. 2009
CA-Riv-9078 (P33-17462)	Temporary Camp: Lithic scatter, ground stone, projectile points, bifaces, FAR. Site limits incompletely defined; extends east west and south beyond established boundary.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9079 (P33-17463)	Temporary Camp: Site limits incompletely defined. Debitage (n=500); ground stone, flake, core tools, and a marine clam shell fragment.	New	Prehistoric	Farmer et al. 2009

Resource Type and Designation	Known Resource Description (type, age, content)	When Found	Period/ Era	Information Source
CA-Riv-9080 (P33-17464)	Lithic Scatter: Debitage (n=4).	New	Prehistoric	Farmer et al. 2009
CA-Riv-9081 (P33-17465)	Lithic Scatter: Debitage (n=7).	New	Prehistoric	Farmer et al. 2009
CA-Riv-9083 (P33-17467)	Lithic Scatter: Debitage (n=6+).	New	Prehistoric	Farmer et al. 2009
CA-Riv-9084 (P33-17468)	Temporary Camp: Debitage (n=21), ground stone, and an olivella shell bead.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9206 (P33-17775)	Lithic Scatter: Debitage (n=4), mano	New	Prehistoric	Farmer et al. 2009
CA-Riv-9207 (P33-17776)	Lithic Scatter: Debitage (n=5), core.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9208 (P33-17777)	Lithic Scatter: Debitage (n=7), core	New	Prehistoric	Farmer et al. 2009
CA-Riv-9209 (P33-17778)	Lithic Scatter: Debitage (n=7), 4 ground stone fragments, core.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9210 (P33-17779)	Lithic Scatter: Debitage (n=10), core, metate fragments.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9212 (P33-17781)	Lithic Scatter: Debitage (n=3), side-notched projectile point.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9215 (P33-17784)	Lithic Scatter: Debitage (n=10), concave-base projectile point.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9216 (P33-17785)	Lithic Scatter: Debitage (n=45), hammerstone, core, 2 manos.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9217 (P33-17786)	Lithic Scatter: Debitage (n=3),	New	Prehistoric	Farmer et al. 2009
CA-Riv-9218 (P33-17787)	Lithic Scatter: Debitage (n=2), scraper	New	Prehistoric	Farmer et al. 2009
CA-Riv-9219 (P33-17788)	Lithic Scatter: Debitage (n=3)	New	Prehistoric	Farmer et al. 2009
CA-Riv-9220 (P33-17789)	Lithic Scatter: Debitage (n=92), metate fragment, projectile point tip, Cottonwood projectile point	New	Prehistoric	Farmer et al. 2009
CA-Riv-9221 (P33-17770)	Lithic Scatter: Debitage (n=7).	New	Prehistoric	Farmer et al. 2009
CA-Riv-9222 (P33-17771)	Lithic Scatter: Debitage (n=3).	New	Prehistoric	Farmer et al. 2009
CA-Riv-9223 (P33-17772)	Lithic Scatter: Debitage (n=16).	New	Prehistoric	Farmer et al. 2009
CA-Riv-9226	Lithic and ceramic Scatter: Debitage (n=10); FAR, metate fragment. brownware sherds (n=3), 2 cobble choppers, badly deflated	New	Prehistoric	Farmer et al. 2009
CA-Riv-9227 (P33-17796)	Lithic and ceramic Scatter: Debitage (n=3); brownware sherds (n=14), marine shell fragment	New	Prehistoric	Farmer et al. 2009
CA-Riv-9229 (P33-17798)	Lithic Scatter: Debitage (n=6); mano, metate fragment, cobble choppers	New	Prehistoric	Farmer et al. 2009

Resource Type and Designation	Known Resource Description (type, age, content)	When Found	Period/ Era	Information Source
Ethnographic Resources				
CA-Riv-0132	McCoy Spring National Historic District	Previously known	Prehistoric	McCarthy 1986, 1993
Historical Archaeological Resources				
P-33-1483	Historic Military Mound: horseshoe-shaped, low earth mound.	Previously known	Historic c.1940s (?)	S. Crowley 1978
P33-13597	Historic Refuse Scatter	Previously known	Historic	Mooney & Associates 2004
P33-13598	Historic Refuse Scatter: WW II	Previously known	Historic 1942 post	Mooney & Associates 2004
P33-13655	Historic Refuse Scatter/features: Possible WW II foxholes	Previously known	Historic 1942 post	Mooney & Associates 2004
P33-14146	Historic Refuse Scatter	Previously known	Historic	Mooney & Associates 2005
P33-14170	Historic Refuse Scatter	Previously known	Historic	Mooney & Associates 2005
P33-17326	Historic Refuse Scatter	Previously known	Historic	ICF Jones & Stokes 2008
P-33-1132	Historic Hopkins Well Site, constructed in 1910.	Previously known	Pre-1920 Historic	H. Metcalf 1982, Cowan 1976
P33-14171	Two-track Road	Previously known	Historic	Mooney & Associates 2005
CA-Riv-9203H (P33-17772)	Refuse Scatter: Pull-tab aluminum cans, food cans, bottle (1954–pres)	New	Historic	Farmer et al. 2009
CA-Riv-9204H (P33-17773)	Refuse Scatter: Can scatter, bottles (1932-1953)	New	Historic	Farmer et al. 2009
CA-Riv-9035H (P33-17419)	Refuse Scatter: Cans, bottle glass, misc.	New	Historic	Farmer et al. 2009
CA-Riv-9059H (P33-17443)	Refuse Scatter : Can scatter. Prehistoric FDLA-Iso-10 recorded within site boundaries.	New	Historic	Farmer et al. 2009
CA-Riv-9063H (P33-17447)	Refuse Scatter: Cans, spoon (military), pliers.	New	Historic	Farmer et al. 2009
CA-Riv-9074H (P33-17458)	Refuse Scatter: WW II era cans/bottles.	New	Historic	Farmer et al. 2009
CA-Riv-9077H (P33-17461)	Refuse Scatter: Cans/bottle (1940s).	New	Historic	Farmer et al. 2009
CA-Riv-9211H (P33-17780)	Refuse Scatter: Cans, bottle glass, 1934 penny	New	Historic	Farmer et al. 2009

Resource Type and Designation	Known Resource Description (type, age, content)	When Found	Period/ Era	Information Source
CA-Riv-9213H (P33-17782)	Refuse Scatter: Approximately 60 cans.	New	Historic	Farmer et al. 2009
CA-Riv-9214H (P33-17783)	Refuse Scatter: Approximately 10 cans.	New	Historic	Farmer et al. 2009
CA-Riv-9225H (P33-17794)	Refuse Scatter: 7 cans, mess-kit fork	New	Historic	Farmer et al. 2009
CA-Riv-9228H (P33-17797)	Refuse Scatter: 10 cans, bottle base (1938-1951), bottle base (1916-1931), razor blade, glass fragments	New	Historic	Farmer et al. 2009
CA-Riv-9230H (P33-17799)	Refuse Scatter: 30+ C-ration cans, 13 other cans,	New	Historic	Farmer et al. 2009
Dual-Component Resources				
CA-Riv-9205H (P33-17774)	Refuse Scatter/Lithic Scatter: Debitage (n=4); mano, 2 metate fragments. Glass bottles (post 1945), auto parts (1930-1940), condensed milk cans	New	Prehistoric/Historic	Farmer et al. 2009
CA-Riv-9058H (P33-17442)	Temporary Camp/Refuse Scatter: Debitage, ground stone, and ceramic fragments. historic-period cans and bottles.	New	Prehistoric/Historic	Farmer et al. 2009
CA-Riv-9082H (P33-17466)	Lithic Scatter/Refuse Deposit: Debitage (n=7).	New	Prehistoric/Historic	Farmer et al. 2009
CA-Riv-9224 (P33-17793)	Lithic and Ceramic Scatter/Refuse Scatter: Debitage (n=80+); FAR, brownware sherds (n=28+), Desert Side-notched projectile point, projectile point tip 2 metate fragments, core /.45 caliber bullets, mess-kit spoon stamped “US”, C-ration coffee can, pocket knife	New	Prehistoric/Historic	Farmer et al. 2009
Built-Environment Resources				
No number	Blythe-Eagle Mountain Transmission Line	New	Historic	Farmer et al. 2009, app. F
No number	Wiley’s Well Road	New	Historic	Farmer et al. 2009, app. F
Unknown				
P-33-000144	No details on site record. Note: F.R. Johnson on map in Walker’s possession.	Previously known	Unknown	Eberhart 1951

C.3.5.1.3.7. NRHP and CRHR Evaluations of Cultural Resources in the APEs

Energy Commission staff has determined for each cultural resource subject to potential impacts from the GSEP both its CRHR eligibility and its NRHP eligibility. Staff has considered only archaeological sites, and has not considered isolates, as distinguished by Tetra Tech.

For this project, staff's standard cultural resources evaluation process is being abbreviated by means of a procedural maneuver, described as "approach 3" above (see "Methodology and Thresholds for Determining Environmental Consequences"). Under "approach 3," staff does not necessarily evaluate the historical significance of each individual resource, but, rather, assumes that many of the known resources subject to project impacts are eligible for the NRHP, the CRHR, or both. Then, under "approach 3," the project's impacts to all assumed register-eligible resources would have to be mitigated by means of avoidance or mitigation in the form of data recovery.

For any resources where staff has sufficient information to determine the resource's eligibility for either register, staff will make that determination. If, on the basis of data staff has in hand, staff can determine that a resource is not eligible for either register, then no avoidance or data recovery as mitigation would be necessary for project impacts to the resource. If staff can determine, on the basis of data in hand, that a resource is eligible for either register, then avoidance or data recovery would be necessary. Similarly, if staff cannot determine, on the basis of data in hand, whether a resource is register-eligible or not, staff would assume register eligibility, and impacts to the resource would have to be avoided or mitigated.

The applicant originally determined that there were 34 archaeological sites and 2 built environment resources that could be potentially impacted by the construction of GSEP. All of these resources were identified during the intensive pedestrian cultural resources surveys conducted by Tetra Tech (Farmer et al 2009), since no previously recorded sites were present within the site footprint or linear facilities corridor. On the basis of archival research and surface observation during pedestrian surveys Tetra Tech recommended that two of the original 36 resources (CA-Riv-9072 and CA-Riv-9224) may be eligible for listing in the NRHP and the CRHR.

The proposed route of the GSEP linear facilities corridor has since been changed (TTEC 2010c), and five of the original archaeological sites would be avoided (CA-Riv-9224, CA-Riv-9225, CA-Riv-9226, CA-Riv-9229, CA-Riv-9230), including CA-Riv-9224, one of the sites Tetra Tech recommended as eligible for listing in the NRHP and the CRHR. Therefore, the applicant considers that 29 archaeological sites (not including the 2 built-environment resources), will possibly be impacted by the proposed project. Tetra Tech consequently recommends only one of these resources (CA-Riv-9072) is potentially eligible for listing in the NRHP and the CRHR. The cultural resources survey for the new proposed linear facilities corridor has not yet been completed. However, additional sites may be added to this total based on the results of this survey.

The above calculations were the result of a number of communications between Tetra Tech and Energy Commission staff (CEC 2009a, CEC 2009c, CEC 2009f). Staff concurs with the conclusions reached by the applicant, with three additions. First, staff

concludes that the proposed project has the potential to indirectly impact the McCoy Spring National Register District. This resource was nominated to the NRHP for its contribution to Mojave Desert prehistory, and it may also be eligible for listing on the NRHP under Criterion A as a traditional cultural property. Second, staff further concludes that the proposed project has the potential to directly impact prehistoric cultural resources that are potential contributing elements in the Prehistoric Trails Network Cultural Landscape. McCoy Spring National Register District is a potential contributor to the PTN Cultural Landscape. Finally, staff concludes that the proposed project may directly impact historic-period cultural resources that are potential contributing elements to the World War II Desert Training Center California-Arizona Maneuver Area (DTC/C-AMA) Cultural Landscape. The portions of the two linear built-environment resources within the built-environment APE are not considered eligible for listing on the NRHP or the CRHR. Other portions of Wiley's Well Road, however, are considered eligible.

Therefore the proposed project has the potential to impact 29 resources and 2 cultural landscapes within the archaeological APE and 1 resource or historic district within the ethnographic APE.

Currently (without consideration of any additional resources that may be identified during the new linear facilities corridor survey), the resources that the GSEP could impact include 26 archaeological resources in the GSEP site footprint that would be subject to physical impacts, 3 further archaeological resources along the linear facilities corridor that the applicant may be able to actively avoid, 1 archaeological site that is also a possible TCP, the impacts to which remain to be evaluated, and potential 2 cultural landscapes that would be subject to physical impacts. Twenty-three of the 30 archaeological resources are prehistoric-to-early-historic-period Native American archaeological sites (including McCoy Spring), 6 are historical archaeological sites, and 1 is a multiple-component archaeological site that includes both prehistoric and historic-period components. The portions of the two linear built-environment resources within the GSEP built-environment APE do not appear to be subject to physical impacts.

The evaluations of whether archaeological resources are eligible for listing in the NRHP and the CRHR and are, therefore, historical resources under CEQA include only the 32 resources that the Energy Commission staff understands, at this time, to be potentially subject to impacts from the proposed project. Of the 32 cultural resources subject to evaluation, below, staff recommends that 2 resources (CA-Riv-9072 and Wiley's Well Road) are eligible for listing in the NRHP and CRHR, that 15 individual resources are not eligible for such listing, that 14 individual resources and two possible cultural landscapes are assumed eligible for listing in the NRHP and the CRHR (Cultural Resources Table 6). The remaining cultural resource, McCoy Spring, is already listed on both the NRHP and the CRHR.

CULTURAL RESOURCES Table 6
NRHP- and CRHR-Eligible Known Cultural Resources for Which Avoidance or Mitigation of Project Impacts Would Be Required

Resource Type, Designation	Resource Description (type, size, content)	NRHP/CRHR Eligibility
Cultural Landscapes		
DTC/C-AMA Cultural Landscape	Not all contributors located in GSEP APE: potentially includes some sites listed below.	Assumed Eligible
Prehistoric Trails Network Cultural Landscape	Not all contributors located in GSEP APE: potentially includes some sites listed below.	Assumed Eligible
Prehistoric Archaeological Resources		
CA-Riv-9072	Temporary Camp: 300 acres, features, 1000s artifacts. PTN Cultural Landscape contributor	Eligible
CA-Riv-9084	Temporary Camp: Debitage (n=21), ground stone, and an olivella shell bead.	Assumed Eligible
CA-Riv-9209	Artifact Scatter: Debitage (n=7), 4 ground stone fragments, core.	Assumed Eligible
CA-Riv-9215	Artifact Scatter: Debitage (n=10), concave-base projectile point.	Assumed Eligible
CA-Riv-9216	Artifact Scatter: Debitage (n=45), hammerstone, core, 2 manos.	Assumed Eligible
CA-Riv-9220	Artifact Scatter: Debitage (n=92), metate fragment, projectile point tip, Cottonwood projectile point .	Assumed Eligible
CA-Riv-9223	Artifact Scatter: Debitage (n=16).	Assumed Eligible
CA-Riv-9227	Artifact Scatter: Debitage (n=3); brownware sherds (n=14), marine shell fragment.	Assumed Eligible
Ethnographic Resources		
	McCoy Spring National Register District: largest petroglyph site in Mojave Desert, midden, multiple trails. PTN Cultural Landscape contributor	Listed on both
Historical Archaeological Resources		

Resource Type, Designation	Resource Description (type, size, content)	NRHP/CRHR Eligibility
CA-Riv-9203H	Refuse Scatter: Approximately 84 food and beverage cans, can fragments, glass bottles, and plastic. Dual component? Post 1950? Possible contributor to DTC/C-AMA Cultural Landscape.	Assumed Eligible
CA-Riv-9204H	Refuse Scatter: Can scatter, bottles (1932-1953). Possible contributor to DTC/C-AMA Cultural Landscape.	Assumed Eligible
CA-Riv-9211H	Refuse Scatter: Cans, bottle glass, 1934 penny. Possible contributor to DTC/C-AMA Cultural Landscape.	Assumed Eligible
CA-Riv-9213H	Refuse Scatter: Approximately 60 cans. Possible contributor to DTC/C-AMA Cultural Landscape.	Assumed Eligible
CA-Riv-9214H	Refuse Scatter: Approximately 10 cans. Possible contributor to DTC/C-AMA Cultural Landscape.	Assumed Eligible
CA-Riv-9228H	Refuse Scatter: 10 cans, bottle base (1938-1951), bottle base (1916-1931), razor blade, glass fragments. Possible contributor to DTC/C-AMA Cultural Landscape.	Assumed Eligible
Dual Component Resources		
CA-Riv-9205H	Refuse Scatter/Lithic Scatter: Debitage (n=4); mano, 2 metate fragments. Glass bottles (post 1945), auto parts (1930-1940), condensed milk cans. Possible contributor to DTC/C-AMA Cultural Landscape.	Assumed Eligible
Built-Environment Resources		
No Number	Blythe-Eagle Mountain Transmission Line	Not Eligible
No Number	Wiley's Well Road	Eligible

The descriptions and the evaluations of the NRHP or CRHR eligibility of the 32 individual resources, and the 2 possible cultural landscapes that the proposed project would impact are presented below. The information for the descriptions and the evaluations is drawn from a number of sources that include preliminary technical reports (Farmer et al. 2009 and app. G, DPR 523 forms; TTEC 2010e), email correspondence, and discussions that were held at the December 31, 2009, and January 6, 2010, Data Response workshops.

C.3.5.1.3.7.1. Prehistoric Archaeological Resources

CA-Riv-9047 (P33-17431)

This site is an oblong prehistoric archaeological deposit approximately 2,025 square meters (m) (0.5 acre) in area. It is located near the southern boundary of the site footprint. The long axis of the deposit parallels a north-south trending ephemeral wash cutting through the sand and gravel of the site surface. The predominant vegetation on the site appears to be Mojave creosote bush scrub. Other information about the physical character of the site surface is unspecified. The surface component of the site measures approximately 62 m from north to south and 35 m from east to west. It consists of a sparse scatter of 5 artifacts which includes 1 cortical and 3 interior flakes of quartz and 1 cortical flake of chert. Further character of the artifacts at this site is unreported. The depth of the site deposit is undetermined.

The more particular physical context for site CA-Riv-9047, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be the edge of the oldest lakeshore (Ql) where it intersects with the Holocene sand sheet of the Qsr unit and the Holocene alluvium of the Qal unit. The possibility of buried cultural resources within these units is expected to be moderate within approximately 2 feet of the modern ground surface, in sediments stratigraphically above the Qoaf alluvium. The potential for artifacts within the Qoaf alluvial deposits, in consideration of the apparent Pleistocene age of those deposits, is considered slight. This site is also located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash and in correspondingly poorer preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Nonetheless, materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant suggest no age or functional interpretation for the site, but suggest that the dearth of cultural constituents indicates that prehistoric activity at the site was very brief in duration. The archaeologists recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The sparse character of the surface assemblage and the apparent absence of materials that would facilitate the placement of the deposit in time seem to indicate that the site does not have the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9047 (P33-17431) is not eligible for listing in the NRHP or the CRHR.

CA-Riv-9048 (P33-17432)

This site is an oblong prehistoric archaeological deposit oriented north-south approximately 2,025 square m (0.5 acre) in area. It is located near the near the southern boundary of the site footprint. The predominant vegetation on the site appears to be Mojave creosote bush scrub. Other information about the physical character of the site surface is unspecified. The surface component of the site measures approximately 78 m from north to south and 31 m from east to west. It consists of a sparse scatter of 10 lithic artifacts which includes 3 chert flakes, 1 chalcedony flake, 1 rhyolite flake, 3 quartz flakes, and 2 quartzite flakes. The depth of the site deposit is undetermined.

The more particular physical context for site CA-Riv-9048, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be edge of the oldest lakeshore (Ql) where it intersects with the Holocene sand sheet of the Qsr unit and the Holocene alluvium of the Qal unit. The possibility of buried cultural resources within these units is expected to be moderate within approximately 2 feet of the modern ground surface, in sediments stratigraphically above the Qoaf alluvium. The potential for artifacts within the Qoaf alluvial deposits, in consideration of the apparent Pleistocene age of those deposits, is considered slight. This site is also located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash and in correspondingly poorer preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Nonetheless, materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant suggest no age or functional interpretation for the site. The archaeologists recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The sparse character of the surface assemblage and the apparent absence of materials that would facilitate the placement of the deposit in time seem to indicate that the site does not have the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9048 (P33-17432) is not eligible for listing in the NRHP or the CRHR.

CA-Riv-9051 (P33-17435)

This site is an oblong prehistoric archaeological deposit oriented northwest-southeast approximately 810 square m (0.2 acre), in area. The deposit is near the southern boundary of the site footprint. The predominant vegetation on the site appears to be Mojave creosote bush scrub. Other information about the physical character of the site surface is unspecified. The surface component of the site measures approximately 49 m from northwest to southeast and 19 m from northeast to southwest. It consists of a low density scatter of 5 prehistoric artifacts including 3 chert cortical flakes, 1 quartzite interior flake and 1 multi-directional chert core. The presence of a chert core and similar chert flakes raised the possibility that this site was potentially a single-use lithic work station. However, an in-field refit analysis revealed that none of the chert debitage co-joined with one another, or with the core. The depth of the site deposit is undetermined.

The more particular physical context for site CA-Riv-9051, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be within the Holocene sand sheet of the Qsr unit and the Holocene alluvium of the Qal unit (see “Present Process Geomorphology” and “Results of Geoarchaeological Investigations” subsections, above). The possibility of buried cultural resources within these units is expected to be moderate within approximately 2 feet of the modern ground surface, in sediments stratigraphically above the Qoaf alluvium. The potential for artifacts within the Qoaf alluvial deposits, in consideration of the apparent Pleistocene age of those deposits, is considered slight. This site is also located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash and in correspondingly poorer preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials.

Nonetheless, materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant suggest no age or alternative functional interpretation for the site. Further, the archaeologists recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The sparse character of the surface assemblage and the apparent absence of materials that would facilitate the placement of the deposit in time seem to indicate that the site does not have the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9051 (P33-17435) is not eligible for listing in the NRHP or the CRHR.

CA-Riv-9072 (P33-17456)

This site is an oblong prehistoric archaeological deposit approximately 15,246,000 square m (350 acres) in area. It is located in the southwest corner of the site footprint. Only a small portion of the east end of the site overlaps with the proposed GSEP facility footprint. Multiple minor seasonal drainages run from north to south through the site. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The present site surface consists of a mosaic of desert pavement interspersed with sand and gravel alluvium. The surface component of the site measures approximately 1,820 m from east to west and 980 m from north to south. The site was originally recorded during the Class II survey. Its boundaries were subsequently enlarged when it was revisited during the Class III survey.

The site includes a low to moderate density artifact scatter and three artifact concentrations. Due to the size of the site the total number of artifacts was estimated. It appears to consist of at least 1,000 artifacts, predominantly prehistoric lithics. The lithic material types present include chert, jasper, quartzite, and crystalline quartz. The lithic scatter is sparse but is characterized by intermittent pockets of elevated artifact density which could represent intensified activity areas or, given the dynamic landform (e.g. sheet flow, seasonal drainages, to erosion), an increased surface visibility. All stages of reduction were in abundant evidence, suggesting that a full range of lithic industry (from testing/procurement to biface/tool manufacture and finishing) was practiced here. At least 12 lithic tools were identified including 1 black chert Rose Spring projectile point, 1 chert Cottonwood Triangular point, 2 quartz bifaces, 3 stage-1 black chert bifaces, 1 chert scraper, 2 chert cores, 2 quartzite cores, and an unknown number of core and flake-based tools. Other artifacts noted at the site included 33 quartzite metates or metate fragments, 5 quartzite manos, and 1 fragment of marine clam shell (species unknown). No evidence of a subsurface deposit was noted, but the actual depth of the site has not been determined.

Two artifact concentrations were noted in the western half of the site and a third along the north central site boundary. Concentration 1 consists of 10 brownware sherds within a 4 square-meter area. Nine body sherds and 1 base sherd were noted. Concentration 2 is located 10 m to the south of Concentration 1. This concentration consists of 11 brownware sherds within a 2-square-meter area. Nine body sherds, 1 neck sherd, and 1 rim sherd were observed. Four additional sherds were noted several meters to the south. The archaeologists for the applicant suggest that both of these concentrations

represent single, broken ceramic vessels, or pot drops. Staff notes that pot drops in non-random patterns have been associated with trails along main travel routes as well as trails that approach springs and tanks (Schaefer and Laylander 2007, p. 254). No evidence of a trail was noted near this site, but the close presence of prehistoric trails known to follow the I-10 corridor, McCoy Spring, and Ford Dry Lake itself, suggest that ceremonial pot drops may be present in the vicinity. These patterns are discussed in more detail in subsection C.3.5.1.3.6.4. “Summary of Identified Cultural Resources in the APEs and Vicinity.” Concentration 3 is a deflated hearth with approximately 21 pieces of fire-affected rock (FAR); it was identified within a north-south trending seasonal drainage. The hearth measures 98 centimeters (cm) from northeast to southwest and 68 cm southeast to northwest. In addition, two quartzite choppers, seven quartzite hammerstones, a rhyolite dome scraper, and an unmodified fragment of marine clam shell were observed.

The more particular physical context for site CA-Riv-9072, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to include the lake deposits of the Ql unit between the 377-footshoreline and the 370–373-foot shoreline as well as the Holocene sand sheet of the Qsr unit and the Holocene alluvium of the Qal unit (see “Present Process Geomorphology” and “Results of Geoarchaeological Investigations” subsections, above). The possibility of buried cultural resources within the Qal and Qsr units is expected to be moderate within approximately 2 feet of the modern ground surface, in sediments stratigraphically above the Qoaf alluvium. The potential for artifacts within the Qoaf alluvial deposits, in consideration of the apparent Pleistocene age of those deposits, is considered slight. The possibility of buried cultural resources within the lake deposits is expected to be moderate. However, the depth of these deposits is undetermined. This site is located in an area characterized by low-energy sheet wash which is conducive to the preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant do not specify a function for the site. They do suggest that the presence of ceramics is generally consistent with the Late Prehistoric (1100 cal BC to Contact). The presence of a Cottonwood Triangular projectile point supports this suggestion. Staff notes that the presence of a Rose Spring projectile point may indicate that this was a multi-component site. The Rose Spring style is associated with the Rose Spring complex which dates between cal AD 200 and cal AD 1100 (Sutton et al. 2007, p. 236). Sites from this time are often found near springs, along washes, and sometimes on lakeshores, and can include evidence of intensive occupation such as house remains.

The archaeologists for the applicant recommend that this site be found eligible for listing in the NRHP under Criterion D. They note that the artifacts at the site appear to have well preserved spatial relationships, include datable materials, and include sufficient quantity of artifacts to allow statistically significant research (Farmer et al. 2009, p. 88). In addition previous research in the region suggests that the presence of pot drops within the boundaries of larger prehistoric sites indicates the presence of a trail. As such, this site may be a contributor to the PTN Cultural Landscape. The above considerations lead staff to recommend that site CA-Riv-9072 (P33-17456) is eligible for

listing in the NRHP under Criterion D, and the CRHR under Criterion 4, because the resource has yielded and has potential to yield information important to the middle-to-late prehistory of the Mojave Desert.

Staff considers possible mitigation measures for GSEP impacts to this site, below (see C.3.5.2.1.5., “Possible Mitigation Measures for Individual Sites“).

CA-Riv-9073 (P33-17457)

This site is an oblong prehistoric archaeological deposit approximately 602 square feet (0.014 acres) in area. It is located near the southwest border of the proposed GSEP linear facilities corridor approximately 2.3 miles directly north of I-10. An intermittent drainage is located to the northwest of the site. The present site surface is a slightly elevated northeast-to-southwest-trending desert pavement. Further information about the present site surface is unspecified. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The surface component of the site measures approximately 17 m from northeast to southwest and 4 m from northwest to southeast. This sparse scatter of 4 prehistoric artifacts includes 1 quartzite primary flake, 1 retouched chert flake, 1 chert interior flake, and 1 chert flake tool. All of the artifacts are wind or water worn, suggesting great age. No evidence of a subsurface deposit was noted, but the actual depth of the site has not been determined.

The more particular physical context for site CA-Riv-9073, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be within the lake deposits of the Ql unit between the 377-footshoreline and the 370–373-foot shoreline (see “Present Process Geomorphology” and “Results of Geoarchaeological Investigations” subsections, above). The possibility of buried cultural resources within the lake deposits is expected to be moderate. However, the depth of these deposits is undetermined. This site is also located in an area noted for low-energy sheet wash which may have resulted in correspondingly good preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant suggest no age or functional interpretation for the site. They further recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The sparse character of the surface assemblage and the apparent absence of materials that would facilitate the placement of the deposit in time seem to indicate that the site does not have the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9073 (P33-17457) is not eligible for listing in the NRHP or the CRHR.

CA-Riv-9084 (P33-17468)

This site is an irregularly shaped prehistoric archaeological deposit approximately 1,219,680 square m (28 acres) in area. It is located on the southern boundary of the site footprint. Two minor seasonal drainages run from north to south through the northern portion of the site. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The present site surface consists of a mosaic of desert pavement interspersed with sand and gravel alluvium. The surface component of the site

measures approximately 38 m from east to west and 70 m from north to south. The site was originally recorded during the Class II survey. Its boundaries were subsequently enlarged when it was revisited during the Class III survey. It includes a light scatter of prehistoric artifacts and two artifact concentrations in the northern part of the site. In total, it appears that 96 artifacts were present. Artifact totals for each concentration and for the site as a whole were difficult to calculate using the information provided by the archaeologists for the applicant.

Concentration 1 is an amorphous scatter of artifacts located in the central part of the site. It measures 81 m by 81 m and includes 55 predominately interior and cortical flakes of crystalline quartz, basalt, quartzite, chert, jasper, and chalcedony. Concentration 2 is located at the north end of the site 255 m northeast of Concentration 1. This feature measures 10 m by 6 m and consists of 5 chert, crystalline quart, quartzite, and basalt flakes. The presence of a “historical military part” was noted west of Concentration 2 on the site sketch map. Further information about this artifact was not specified. The remainder of the site is covered with a light scatter of artifacts which include 21 flakes, 2 complete quartzite manos, 3 complete metates (2 possible schist, 1 rhyolitic), 3 metate fragments (1 quartzite, 2 rhyolitic), 1 piece of marine shell, 1 Olivella shell bead, 1 crystalline quartz block core, 1 quartzite multi-directional core, 1 jasper multi-directional core 1 quartz biface, and 1 quartz biface fragment. Overall, interior flakes comprised the greatest share of the debitage (at 50 percent), while shatter and cortical flakes together make up about 38 percent of the scatter, indicating that primary and secondary flake production were the principal activities. No evidence of a subsurface deposit was noted, but the actual depth of the site has not been determined.

The more particular physical context for site CA-Riv-9084, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be within the lake deposits of the Ql unit between the 377-footshoreline and the 370–373-foot shoreline (see “Present Process Geomorphology” and “Results of Geoarchaeological Investigations” subsections, above). The possibility of buried cultural resources within the lake deposits is expected to be moderate. However, the depth of these deposits is undetermined. This site is also located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash and in correspondingly poorer preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Nonetheless, subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant note that one function of the site may have been stone tool manufacture and repair. Staff adds that the presence of ground stone suggests that food processing also took place here possibly indicating the site was a temporary camp. The archaeologists for the applicant further suggest that Concentrations 1 and 2 may represent two separate activity loci. It is unclear if they consider the ground stone scatter in the southern part of the site a possible third activity locus. The temporal relationships between the various parts of the site are unclear. However, the archaeologists for the applicant mention that the presence of ground stone indicates that at least some of the deposit was created during or after the Late Archaic period (8000 to 6000 cal BC). In addition, the Olivella shell bead in the

northeastern corner of the site links it to the Late Prehistoric (1100 cal BC to Contact) period.

The archaeologists for the applicant recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The rationale may be tied to the sparse character of the surface assemblage and the apparent absence of materials that would clarify the temporal relationships between the site components, indicating that the site does not have the potential to yield information important to prehistory. Without primary field data on the presence of a subsurface component for the site, staff cannot evaluate the site sufficiently to reasonably dismiss the possibility that it may retain the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9084 (P33-17468) be assumed eligible for listing in the NRHP and the CRHR, for the purpose of the present analysis.

Staff considers possible mitigation measures for GSEP impacts to this site and six other prehistoric artifact scatters, below (see C.3.5.2.1.5., “Possible Mitigation Measures for Individual Sites“).

CA-Riv-9206 (P33-17775)

This site is an oblong prehistoric archaeological deposit oriented north-south approximately 161 square m (0.04 acres), in area. The deposit is in the southeastern portion of the site footprint near the southern boundary, 116 m north of CA-Riv-9205/H (P33-17773). The predominant vegetation on the site appears to be Mojave creosote bush scrub. The present site surface consists of sandy and gravelly soils with numerous small ephemeral dry channels traversing the area. The surface component of the site measures approximately 11 m from east to west and 25 m from north to south. Observed surface cultural constituents consist of 1 cortical quartzite flake, 2 interior chert flakes, 1 chalcedony flake, and 1 granitic mano fragment. There was apparently no evidence of a subsurface deposit at the site, but its actual depth is undetermined.

The more particular physical context for site CA-Riv-9206, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be within the lake deposits of the Ql unit between the 377-footshoreline and the 370–373-foot shoreline (see “Present Process Geomorphology” and “Results of Geoarchaeological Investigations” subsections, above). The possibility of buried cultural resources within the lake deposits is expected to be moderate. However, the depth of these deposits is undetermined. This site is also located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash and in correspondingly poorer preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Nonetheless, subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant suggest that the presence of ground stone at the site may indicate a date of as early as the Late Archaic times (8000 to 6000 cal BC) or as late as the Late Prehistoric (1100 cal BC to Contact). However, they provide no functional interpretation for the site. Further, they recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation.

Considering the sparse character of the surface assemblage and the apparent absence of materials that would facilitate the placement of the deposit more specifically in time, the site does not appear to have the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9206 (P33-17775) is not eligible for listing in the NRHP or the CRHR.

CA-Riv-9207 (P33-17776)

This site is a trapezoidal prehistoric archaeological deposit approximately 2,711 square m (0.7 acres) in area. It is located in the southeastern portion of the site footprint near the southern boundary, approximately 40 m north of CA-Riv-9206 (P33-17775). The present site surface consists of relatively flat sandy and gravelly soils with numerous small erosion channels. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The surface component of the site measures approximately 86 m from east to west and 73 m from north to south. This light scatter of 8 artifacts includes 4 chert cortical flakes, 1 quartzite cortical flake, 1 quartzite core, 1 chert tested cobble, and 1 soluble coffee can. The artifact scatter appears to be primarily a surface deposit, but its actual depth is undetermined.

The more particular physical context for site CA-Riv-9207, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be edge of the oldest lakeshore (Ql) where it intersects with the Holocene sand sheet of the Qsr unit and the Holocene alluvium of the Qal unit (see “Present Process Geomorphology” and “Results of Geoarchaeological Investigations” subsections, above). The possibility of buried cultural resources within these units is expected to be moderate within approximately 2 feet of the modern ground surface, in sediments stratigraphically above the Qoaf alluvium. The potential for artifacts within the Qoaf alluvial deposits, in consideration of the apparent Pleistocene age of those deposits, is considered slight. This site is also located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash and in correspondingly poorer preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Nonetheless, subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The function of the site is unspecified, however the archaeologists for the applicant note that the prehistoric lithic artifacts appear to be randomly scattered across the surface rather than clustered into tight loci. This pattern suggests that the site did not serve as a flint-knapping location. The archaeologists for the applicant suggest no temporal association or functional interpretation for the site. They also recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The sparse character of the surface assemblage and the apparent absence of materials that would facilitate the placement of the deposit in time seem to indicate that the site does not have the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9207 (P33-17776) is not eligible for listing in the NRHP or the CRHR.

CA-Riv-9208 (P33-17777)

This site is an oblong prehistoric archaeological deposit approximately 647 square m (0.2 acres) in area. It is located in the southeastern portion of the site footprint near the southern boundary, approximately 86 m north of CA-Riv-92010 (P33-17778). The present site surface consists of relatively flat sandy and gravelly soils with numerous small erosion channels. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The surface component of the site measures approximately 25 m from east to west and 24 m from north to south. This light scatter of 8 prehistoric artifacts includes 4 chert cortical flakes, 1 quartzite cortical flake, 1 chalcedony cortical flake, 1 jasper cortical flake, and 1 chalcedony core. No evidence of a subsurface deposit was noted, but the actual depth of the site is undetermined.

The more particular physical context for site CA-Riv-9208, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be located on the Holocene sand sheet of the Qsr unit and the Holocene alluvium of the Qal unit (see “Present Process Geomorphology” and “Results of Geoarchaeological Investigations” subsections, above). The possibility of buried cultural resources within these units is expected to be moderate within approximately 2 feet of the modern ground surface, in sediments stratigraphically above the Qoaf alluvium. The potential for artifacts within the Qoaf alluvial deposits, in consideration of the apparent Pleistocene age of those deposits, is considered slight. This site is also located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash and in correspondingly poorer preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Nonetheless, subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant do not specify the function of the site however they note that the prehistoric lithic artifacts appear to be randomly scattered across the surface rather than clustered into tight loci. This pattern suggests that the site did not serve as a flint-knapping location. The archaeologists for the applicant suggest no temporal association or functional interpretation for the site. The archaeologists recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The sparse character of the surface assemblage and the apparent absence of materials that would facilitate the placement of the deposit in time seem to indicate that the site does not have the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9208 (P33-17777) is not eligible for listing in the NRHP or the CRHR.

CA-Riv-9209 (P33-17778)

This site is an oblong prehistoric archaeological deposit approximately 7,689 square m (2 acres) in area. It is located in the southeastern portion of the site footprint near the southern boundary, approximately 86 m south of CA-Riv-9208 (P33-17777). The present site surface consists of relatively flat sandy and gravelly soils, with numerous small erosion channels. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The surface component of the site measures approximately 85 m from east to west and 100 m from north to south. This light scatter of 24 prehistoric artifacts includes 7 interior flakes and 1 cortical flake of chert, 1 interior flake of quartz, 1

piece of chalcedony shatter, 3 interior flakes of jasper, 4 cortical flakes of quartzite, 2 multi-directional chert cores, 1 quartzite hammer stone, and 4 quartz monzonite metate fragments. The scatter appears to be primarily a surface deposit with some partial subsurface artifacts, most likely the result of the movement of wind and waterborne sediment.

The more particular physical context for site CA-Riv-9209, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be within the lake deposits of the Ql unit between the 377-footshoreline and the 370–373-foot shoreline (see "Present Process Geomorphology" and "Results of Geoarchaeological Investigations" subsections, above). The possibility of buried cultural resources within the lake deposits is expected to be moderate. However, the depth of these deposits is undetermined. This site is also located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash and in correspondingly poorer preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Nonetheless, subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant do not specify a function for the site. They do suggest that the presence of ground stone is generally consistent with a Late Archaic period occupation (8000 to 6000 cal BC), but do not explain why this site could not also be consistent with other time periods when ground stone was used, such as the Late Prehistoric (1100 cal BC to Contact). Further, they recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The rationale may be tied to the sparse character of the surface assemblage indicating that the site does not have the potential to yield information important to prehistory. Without primary field data on the presence of a subsurface component for the site, staff cannot evaluate the site sufficiently to reasonably dismiss the possibility that it may retain the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9209 (P33-17778) be assumed eligible for listing in the NRHP and the CRHR, for the purpose of the present analysis.

Staff considers possible mitigation measures for GSEP impacts to this site and six other prehistoric artifact scatters, below (see C.3.5.2.1.5., "Possible Mitigation Measures for Individual Sites").

CA-Riv-9210 (P33-17779)

This site is an irregularly shaped prehistoric archaeological deposit approximately 1,982 square m (0.5 acres) in area. It is located in the southeastern portion of the site footprint near the southern boundary, approximately 95 m south of CA-Riv-9209H (P33-17778). The present site surface consists of a slightly elevated terrace of alluvium, with patches of desert pavement. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The surface component of the site measures approximately 50 m from east to west and 90 m from north to south. This sparse scatter of 13 prehistoric artifacts includes 10 lithic flakes, 2 monzonite metate fragments, and 1 depleted chalcedony core with cortex. The scatter appears to be primarily a surface deposit, but the actual depth of the site is undetermined.

The more particular physical context for site CA-Riv-9210, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be within the lake deposits of the Ql unit between the 377-footshoreline and the 370–373-foot shoreline (see “Present Process Geomorphology” and “Results of Geoarchaeological Investigations” subsections, above). The possibility of buried cultural resources within the lake deposits is expected to be moderate. However, the depth of these deposits is undetermined. This site is also located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash and in correspondingly poorer preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Nonetheless, subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant suggest no temporal association or functional interpretation for the site. They further recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The sparse character of the surface assemblage and the apparent absence of materials that would facilitate the placement of the deposit more specifically in time seem to indicate that the site does not have the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9210 (P33-17779) is not eligible for listing in the NRHP or the CRHR.

CA-Riv-9212 (P33-17781)

This site is an oblong prehistoric archaeological deposit approximately 202 square m (0.06 acres) in area. It is located near the center of the southeastern portion of the proposed site footprint, approximately 50 m north of CA-Riv-9211H (P33-17780). The present site surface consists of sandy and gravelly soils within a minor dune and pan like area. A minor dry wash runs parallel to the long axis of the site and numerous small ephemeral dry channels traverse the area. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The surface component of the site measures approximately 32 m from north to south and 8 m from east to west. This sparse scatter of 6 prehistoric artifacts includes 1 interior chert flake, 2 quartzite cortical flakes, 1 rhyolite tested cobble, 1 chalcedony core with cortex, and 1 Desert Side Notched chert projectile point. No evidence of a subsurface deposit was noted, but the actual depth of the site is undetermined.

The more particular physical context for site CA-Riv-9212, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be located on the Holocene sand sheet of the Qsr unit and the Holocene alluvium of the Qal unit (see “Present Process Geomorphology” and “Results of Geoarchaeological Investigations” subsections, above). The possibility of buried cultural resources within these units is expected to be moderate within approximately 2 feet of the modern ground surface, in sediments stratigraphically above the Qoaf alluvium. The potential for artifacts within the Qoaf alluvial deposits, in consideration of the apparent Pleistocene age of those deposits, is considered slight. This site is also located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash and in correspondingly poorer preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials.

Nonetheless, subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant suggest no temporal association or functional interpretation for the site. However, the presence of a Desert Side Notched projectile point suggests that the site dates to the Late Prehistoric period (cal AD 1100 to European contact) (Sutton et al. 2007, p. 236). They further recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The sparse character of the surface assemblage seems to indicate that the site does not have the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9212 (P33-17781) is not eligible for listing in the NRHP or the CRHR.

CA-Riv-9215 (P33-17784)

This site is an irregularly shaped prehistoric archaeological deposit approximately 14,568 square m (3.6 acres) in area. It is located near the southwest corner of the southeastern portion of the proposed site footprint, north of CA-Riv-9220 (P 33-17789). A large unnamed dry wash apparently crosses the site, however the location of the wash is not marked on the sketch map. The present site surface is described as consisting of sand and gravel. Further information about the condition of the present site surface is unspecified. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The surface component of the site measures approximately 129 m from east to west and 169 m from north to south. This sparse scatter of 25 prehistoric artifacts includes 21 lithic flakes, 1 chert projectile point shoulder and base fragment (concave base, undetermined chronology), 1 biface fragment, 1 rhyolite tested cobble, and 1 6-sided quartz crystal were observed. The scatter appears to be primarily a surface deposit, but the actual depth of the site is undetermined.

The more particular physical context for site CA-Riv-9215, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be within the lake deposits of the Ql unit between the 377-footshoreline and the 370–373-foot shoreline (see “Present Process Geomorphology” and “Results of Geoarchaeological Investigations” subsections, above). The possibility of buried cultural resources within the lake deposits is expected to be moderate. However, the depth of these deposits is undetermined. This site is also located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash and in correspondingly poorer preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Nonetheless, subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant suggest no temporal association or functional interpretation for the site. They further recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The rationale may be tied to the sparse character of the surface assemblage and the apparent absence of materials that would facilitate the placement of the deposit in time, indicating that the site does not have the potential to yield information important to prehistory. Without primary field data on the presence of a subsurface component for

the site, staff cannot evaluate the site sufficiently to reasonably dismiss the possibility that it may retain the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9215 (P33-17784) be assumed eligible for listing in the NRHP and the CRHR, for the purpose of the present analysis.

Staff considers possible mitigation measures for GSEP impacts to this site and six other prehistoric artifact scatters, below (see C.3.5.2.1.5., “Possible Mitigation Measures for Individual Sites“).

CA-Riv-9216 (P33-17785)

This site is an oblong prehistoric archaeological deposit approximately 16,511 square m (4 acres) in area. It is located along the western boundary of the southeastern portion of the proposed site footprint, approximately 205 m west of CA-Riv-9209 (P33-17778). A large unnamed dry wash apparently crosses the site, however the location of the wash is not marked on the site map. The present site surface is relatively flat and consists of the sand and gravel. Evidence of aeolian (wind-produced) processes is also present, including lag deposits and small mounds of sand next to creosote bushes. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The surface component of the site measures approximately 83 m from east to west and 317 m from north to south. Overall this site consists of approximately 78 prehistoric and 2 historic-period artifacts. Scattered across the site are 46 lithic flakes, 3 tested cobbles (1 chalcedony, 2 quartzite), 1 exhausted chert core, and 1 granitic mano. Two isolated cans, one soluble coffee can and one rectangular oil can (puncture opened) were also noted. One concentration of 27 prehistoric artifacts is present at the southern end of the site: it measures 15 m from east to west by 35 m from north to south. This concentration consists of approximately 25 flakes, 1 quartzite hammerstone, and 1 possible quartz crystal biface fragment. Both within the concentration and across the site in general, lithic flakes are primarily interior and cortical flakes of a broad range of materials including basalt, chert, chalcedony, quartzite, quartz crystal, and jasper. No evidence of a subsurface deposit was noted, but the actual depth of the site has not been determined.

The more particular physical context for site CA-Riv-9216, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be within the lake deposits of the Ql unit between the 377-footshoreline and the 370–373-foot shoreline (see “Present Process Geomorphology” and “Results of Geoarchaeological Investigations” subsections, above). The possibility of buried cultural resources within the lake deposits is expected to be moderate. However, the depth of these deposits is undetermined. This site is also located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash and in correspondingly poorer preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Nonetheless, subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant suggest no temporal association or functional interpretation for the site. However, the presence of ground stone at the site may indicate that it dates to between the Late Archaic (8000 to 6000 cal BC) and the Late

Prehistoric (1100 cal BC to Contact) periods. Further, a high density lithic concentration suggests that stone tool production and/or maintenance took place in this location. The broad mix of activities taking place at this site, including food preparation and tool production and/or maintenance, suggests that it may have functioned as a temporary camp.

The archaeologists for the applicant recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The rationale may be tied to the sparse character of the surface assemblage and the apparent absence of materials that would facilitate the placement of the deposit more specifically in time, indicating that the site does not have the potential to yield information important to prehistory. Without primary field data on the presence of a subsurface component for the site, staff cannot evaluate the site sufficiently to reasonably dismiss the possibility that it may retain the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9216 (P33-17785) be assumed eligible for listing in the NRHP and the CRHR, for the purpose of the present analysis.

CA-Riv-9217 (P33-17786)

This site is an oblong prehistoric archaeological deposit approximately 971 square m (0.3 acres) in area. In contrast to other sites in the proposed site footprint, its long axis runs from east to west rather than from north to south. It is located near the center of the southeastern portion of the site footprint, approximately 40 m south of CA-Riv-9212 (P33-17781). The present site surface is relatively flat and consists of sand and gravel. Small, dry seasonal drainages are present to the east on west of the site. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The surface component of the site measures approximately 58 m from east to west and 21 m from north to south. This sparse scatter of 3 prehistoric artifacts includes 1 black chert interior flake, 1 red quartzite cortical flake, and 1 brownware pottery sherd. No evidence of a subsurface deposit was noted, but the actual depth of the site has not been determined.

The more particular physical context for site CA-Riv-9217, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be located on the Holocene sand sheet of the Qsr unit and the Holocene alluvium of the Qal unit (see “Present Process Geomorphology” and “Results of Geoarchaeological Investigations” subsections, above). The possibility of buried cultural resources within these units is expected to be moderate within approximately 2 feet of the modern ground surface, in sediments stratigraphically above the Qoaf alluvium. The potential for artifacts within the Qoaf alluvial deposits, in consideration of the apparent Pleistocene age of those deposits, is considered slight. This site is also located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash and in correspondingly poorer preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Nonetheless, subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant suggest no temporal association or functional interpretation for the site. However, the presence of ceramics at the site may indicate that it dates to the Late Prehistoric (1100 cal BC to Contact) period. The archaeologists for the applicant recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The sparse character of the surface assemblage seems to indicate that the site does not have the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9217 (P33-17786) is not eligible for listing in the NRHP or the CRHR.

CA-Riv-9218 (P33-17787)

This site is an oblong prehistoric archaeological deposit approximately 161 m (0.04 acres) in area. It is located near the center of the southeastern portion of the site footprint, approximately 153 m east of CA-Riv-9219 (P33-17788). The present site surface is relatively flat and consists of sand and gravel alluvium. A small, dry seasonal drainage running from north to south cuts across the southern end of the site. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The surface component of the site measures approximately 13 m from east to west and 17 m from north to south. This sparse scatter of 3 prehistoric artifacts includes 1 chert interior flake, 1 cortical quartzite flake, and 1 chert bifacial scraper. No evidence of a subsurface deposit was noted, but the actual depth of the site has not been determined.

The more particular physical context for site CA-Riv-9218, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be located on the Holocene sand sheet of the Qsr unit and the Holocene alluvium of the Qal unit (see “Present Process Geomorphology” and “Results of Geoarchaeological Investigations” subsections, above). The possibility of buried cultural resources within these units is expected to be moderate within approximately 2 feet of the modern ground surface, in sediments stratigraphically above the Qoaf alluvium. The potential for artifacts within the Qoaf alluvial deposits, in consideration of the apparent Pleistocene age of those deposits, is considered slight. This site is also located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash and in correspondingly poorer preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Nonetheless, subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant suggest no temporal association or functional interpretation for the site. The archaeologists for the applicant recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The sparse character of the surface assemblage and the apparent absence of materials that would facilitate the placement of the deposit more specifically in time seem to indicate that the site does not have the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9218 (P33-17787) is not eligible for listing in the NRHP or the CRHR.

CA-Riv-9219 (P33-17788)

This site is an oblong prehistoric archaeological deposit approximately 404 square m (0.1 acres) in area. It is located near the center of the southeastern portion of the site

footprint, approximately 153 m west of CA-Riv-9217 (P33-17786). A small, dry seasonal drainage running from north to south cuts across the site in an unspecified location. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The surface component of the site measures approximately 43 m from northeast to southwest and 17 m from northwest to southeast. This sparse scatter of 3 prehistoric chert artifacts includes 2 cortical flakes and 1 interior flake. No evidence of a subsurface deposit was noted, but the actual depth of the site has not been determined.

The more particular physical context for site CA-Riv-9219, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be located on the Holocene sand sheet of the Qsr unit and the Holocene alluvium of the Qal unit (see "Present Process Geomorphology" and "Results of Geoarchaeological Investigations" subsections, above). The possibility of buried cultural resources within these units is expected to be moderate within approximately 2 feet of the modern ground surface, in sediments stratigraphically above the Qoaf alluvium. The potential for artifacts within the Qoaf alluvial deposits, in consideration of the apparent Pleistocene age of those deposits, is considered slight. This site is also located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash and in correspondingly poorer preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Nonetheless, subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant suggest no temporal association or functional interpretation for the site. The archaeologists for the applicant recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The sparse character of the surface assemblage and the apparent absence of materials that would facilitate the placement of the deposit in time seem to indicate that the site does not have the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9219 (P33-17788) is not eligible for listing in the NRHP or the CRHR.

CA-Riv-9220 (P33-17789)

This site is an irregularly shaped prehistoric archaeological deposit approximately 38,162 square m (9.4 acres) in area. It is located along the southern boundary of the northwestern portion of the site footprint, approximately 171 m south of CA-Riv-9215 (P33-17784). A small, dry seasonal drainage running from north to south cuts across the site in an unspecified location. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The present site surface is composed of sand and gravel alluvium with subdued bar and swale topography. The surface component of the site measures approximately 221 m from east to west and 199 m from north to south. This scatter of 94 prehistoric artifacts includes 92 flakes, 1 brown chert projectile point (Cottonwood Leaf-shaped), and 1 quartz monzonite metate fragment. In general, lithic flakes are primarily interior and cortical flakes of chert and quartzite. No evidence of a subsurface deposit was noted, but the actual depth of the site has not been determined.

The more particular physical context for site CA-Riv-9220, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be within the

lake deposits of the Ql unit between the 377-foot shoreline and the 370–373-foot shoreline (see “Present Process Geomorphology” and “Results of Geoarchaeological Investigations” subsections, above). The possibility of buried cultural resources within the lake deposits is expected to be moderate. However, the depth of these deposits is undetermined. This site is also located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash and in correspondingly poorer preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Nonetheless, subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant suggest no temporal association or functional interpretation for the site. However, the presence of ground stone and a diagnostic projectile point suggest several possibilities for its age and function. The prehistoric use of milling equipment in the Mojave Desert has a broad temporal range, between the Late Archaic (8000 to 6000 cal BC) and the Late Prehistoric (1100 cal BC to Contact) periods. Several kinds of leaf shaped points have been used in the region over time, however. Cottonwood Leaf-shaped points tend to be smaller (approximately 3 cm in length) and some scholars associate them with the Late Cottonwood phase (AD 1840 to 1900) in the northwest Mojave Desert (Moratto 1984, p. 376). Other scholars associate leaf-shaped points primarily with the Pinto Complex of the Middle Holocene (7000 to 3000 cal BC) (Sutton et al. 2007, p. 236). These early artifacts tend to be larger (approximately 5 cm in length), like the chert projectile point found at CA-Riv-9220. The broad mix of activities taking place at this site, including food preparation and possibly tool production and/or maintenance, suggests that it may have functioned as a temporary camp.

The archaeologists for the applicant recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The rationale may be tied to the sparse character of the surface assemblage and the apparent absence of materials that would facilitate the placement of the deposit more specifically in time, indicating that the site does not have the potential to yield information important to prehistory. Without primary field data on the presence of a subsurface component for the site, staff cannot evaluate the site sufficiently to reasonably dismiss the possibility that it may retain the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9220 (P33-17789) be assumed eligible for listing in the NRHP and the CRHR, for the purpose of the present analysis.

Staff considers possible mitigation measures for GSEP impacts to this site and six other prehistoric artifact scatters, below (see C.3.5.2.1.5., “Possible Mitigation Measures for Individual Sites“).

CA-Riv-9221 (P33-17770)

This site is a trapezoidal shaped prehistoric archaeological deposit approximately 1,618 square m (0.4 acres) in area. It is located near the southwest corner of the southeastern portion of the site footprint, approximately 160 m west of CA-Riv-9215 (P33-17784). Numerous minor seasonal drainages run across the site. The predominant vegetation

on the site appears to be Mojave creosote bush scrub. The present site surface is composed of sand and gravel alluvium with subdued bar and swale topography. The surface component of the site measures approximately 33 m from east to west and 58 m from north to south. This sparse scatter of 8 prehistoric artifacts includes 5 chert cortical flakes, 1 chert pressure flake, 1 chert interior flake, and 1 cortical quartz crystal flake. No evidence of a subsurface deposit was noted, but the actual depth of the site has not been determined.

The more particular physical context for site CA-Riv-9221, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be within the lake deposits of the Ql unit between the377-foot shoreline and the 370–373-foot shoreline (see “Present Process Geomorphology” and “Results of Geoarchaeological Investigations” subsections, above). The possibility of buried cultural resources within the lake deposits is expected to be moderate. However, the depth of these deposits is undetermined. This site is also located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash and in correspondingly poorer preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Nonetheless, subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant suggest no temporal association or functional interpretation for the site. The archaeologists for the applicant recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The sparse character of the surface assemblage and the apparent absence of materials that would facilitate the placement of the deposit in time seem to indicate that the site does not have the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9221 (P33-17790) is not eligible for listing in the NRHP or the CRHR.

CA-Riv-9222 (P33-17771)

This site is an oblong prehistoric archaeological deposit oriented east/west and with an area of approximately 1902 square m (0.5 acres). It is located in the northwestern corner of the southeastern portion of the site footprint approximately 722 m northeast of CA-Riv-9223 (P33-17772). Numerous minor seasonal drainages run across the site. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The present site surface is composed of sand and gravel alluvium with subdued bar and swale topography. The surface component of the site measures approximately 60 m from east to west and 39 m from north to south. This sparse scatter of 4 prehistoric artifacts includes 2 chert cortical flakes, 1 chert interior flake, and 1 quartz cortical flake. No evidence of a subsurface deposit was noted, but the actual depth of the site has not been determined.

The more particular physical context for site CA-Riv-9222, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be located on the Holocene sand sheet of the Qsr unit and the Holocene alluvium of the Qal unit (see “Present Process Geomorphology” and “Results of Geoarchaeological Investigations” subsections, above). The possibility of buried cultural resources within these units is

expected to be moderate within approximately 2 feet of the modern ground surface, in sediments stratigraphically above the Qoaf alluvium. The potential for artifacts within the Qoaf alluvial deposits, in consideration of the apparent Pleistocene age of those deposits, is considered slight. This site is located in an area characterized by low-energy sheet wash which is conducive to the preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant suggest no temporal association or functional interpretation for the site. The archaeologists for the applicant recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The sparse character of the surface assemblage and the apparent absence of materials that would facilitate the placement of the deposit in time seem to indicate that the site does not have the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9222 (P33-17791) is not eligible for listing in the NRHP or the CRHR.

CA-Riv-9223 (P33-17772)

This site is a triangular shaped prehistoric archaeological deposit 3,327 square m (0.8 acres) in area. It is located near the western border of the southeastern portion of the site footprint approximately 722 m southwest of CA-Riv-9222 (P33-17771). Numerous minor seasonal drainages run across the site and the immediate vicinity. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The present site surface is composed of sand and gravel alluvium with subdued bar and swale topography. The surface component of the site measures approximately 79 m from east to west and 75 m from north to south. This sparse scatter of 20 quartz prehistoric artifacts includes 13 interior flakes and 3 cortical flakes. No evidence of a subsurface deposit was noted, but the actual depth of the site has not been determined.

The more particular physical context for site CA-Riv-9223, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be located on the Holocene sand sheet of the Qsr unit and the Holocene alluvium of the Qal unit (see “Present Process Geomorphology” and “Results of Geoarchaeological Investigations” subsections, above). The possibility of buried cultural resources within these units is expected to be moderate within approximately 2 feet of the modern ground surface, in sediments stratigraphically above the Qoaf alluvium. The potential for artifacts within the Qoaf alluvial deposits, in consideration of the apparent Pleistocene age of those deposits, is considered slight. This site is located in an area characterized by low-energy sheet wash which is conducive to the preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant suggest that the site represents single flintknapping episode. However, no temporal association is suggested for the site. The archaeologists for the applicant further recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The rationale may be

tied to the sparse character of the surface assemblage and the apparent absence of materials that would facilitate the placement of the deposit in time, indicating that the site does not have the potential to yield information important to prehistory. Without primary field data on the presence of a subsurface component for the site, staff cannot evaluate the site sufficiently to reasonably dismiss the possibility that it may retain the potential to yield information important to prehistory. Staff therefore recommends that site CA-Riv-9223 (P33-17792) be assumed eligible for listing in the NRHP and the CRHR, for the purpose of the present analysis.

Staff considers possible mitigation measures for GSEP impacts to this site and six other prehistoric artifact scatters, below (see C.3.5.2.1.5., "Possible Mitigation Measures for Individual Sites").

CA-Riv-9227 (P33-17796)

This site is a triangular shaped prehistoric archaeological deposit more than 3 acres (130,680 square feet) in area. It is located on the northeastern border of the proposed GSEP linear facilities corridor approximately 1.5 miles directly north of I-10. Several small north/south trending drainages cut through the site in unspecified locations. Further information about the present site surface is unspecified. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The surface component of the site measures approximately 176 m from east to west and 111 m from north to south. This sparse scatter of 18 prehistoric artifacts includes 14 brownware pottery sherds (body, rim, and neck), 1 split chert cobble, 1 chert cortical flake, 1 chert biface thinning flake, and 1 marine shell fragment (species unknown). The marine shell was found in the northern portion of the site. It exhibited polish, but the source of the abrasion, either human or natural, was undetermined. No evidence of a subsurface deposit was noted, but the actual depth of the site has not been determined.

The more particular physical context for site CA-Riv-9227, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be within the lake deposits of the Ql unit between the 377-foot shoreline and the 370–373-foot shoreline (see "Present Process Geomorphology" and "Results of Geoarchaeological Investigations" subsections, above). The possibility of buried cultural resources within the lake deposits is expected to be moderate. However, the depth of these deposits is undetermined. This site is also located in an area noted for high-energy wave action which may have resulted in correspondingly poor preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Nonetheless, subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The archaeologists for the applicant suggest the presence of ceramics at the site may indicate that it dates to the Late Prehistoric (1100 cal BC to Contact) period. However, they provide no functional interpretation for the site. The presence of body, rim, and neck sherds suggests that these ceramic artifacts may represent a disturbed pot drop. Pot drops in non-random patterns have been associated with trails along main travel routes as well as trails that approach springs and tanks (Schaefer and Laylander 2007, p. 254). No evidence of a trail was noted near this site, but the close presence of prehistoric trails known to follow the I-10 corridor, McCoy Spring, and Ford Dry Lake

itself, suggest that ceremonial pot drops may be present in the vicinity. The chert artifacts, suggest that that lithic tool manufacture or maintenance took place in this location. The temporal relationship between these two activities is uncertain, however.

The archaeologists for the applicant recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The rationale may be tied to the sparse character of the surface assemblage and the apparent absence of materials that would facilitate the placement of the deposit in time, indicating that the site does not have the potential to yield information important to prehistory. Without primary field data on the presence of a subsurface component for the site, staff cannot evaluate the site sufficiently to reasonably dismiss the possibility that it may retain the potential to yield information important to prehistory. In addition, the presence of a pot drop suggests that this site may be a contributor to the PTN Cultural Landscape. Staff therefore recommends that site CA-Riv-9227 (P33-17796) be assumed eligible for listing in the NRHP and the CRHR, for the purpose of the present analysis.

Staff considers possible mitigation measures for GSEP impacts to this site and six other prehistoric artifact scatters, and one other potential contributor to the PTN Cultural Landscape below (see C.3.5.2.1.5., “Possible Mitigation Measures for Individual Sites“).

C.3.5.1.3.8.2. Historical Archaeological Sites Evaluations

CA-Riv-9203H (P33-17772)

This site is an oblong historic-period refuse deposit approximately 21,084 square m (5.2 acres) in area. It is located near the southeast corner of the southeastern section of the proposed site footprint, within and adjacent to a northeast/southwest trending seasonal dry wash. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The present site surface is composed of sand and gravel alluvium. Further details about the site surface are unspecified. The surface component of the site measures approximately 100 m from east to west and 370 m from north to south. This site consists of a sparse scatter of more than 84 food and beverage cans, can fragments, glass bottles, and plastic. The can assemblage is reported to include 3 hole-in-top cans (knife- or ice-pick-opened), 3 church-key-opened beverage cans, 50 14.5-ounce food cans (round, key-opened or knife-cut-opened), 2 aluminum pull-tab cans (ring pull tab, c. 1965–1975), 3 15-ounce food cans (opened with a rotary can opener), 1 36-ounce can, and more than 20 can fragments. The glass assemblage is reported to include 1 clear glass condiment bottle with an “I within an O” Owens-Illinois (c. 1954–present) maker’s mark embossed on the base. Finally, 1 yellow plastic tape dispenser was also noted.

In addition to the field investigation, the archaeologists for the applicant also examined historic maps, BLM records, and other historic documents. They found no evidence of any historic dwellings and/or structures on or within several miles of CA-Riv-9203H (P33-17772). The specific documentary sources examined for this site were unspecified. Artifact types and chronological indicators suggest that the refuse scatter is domestic in type, most likely from a single dumping episode, and dating from the mid-1950s to the mid-1970s. This trash deposit could be the result of recent historic

activities such as sheep and cattle ranching, “Desert Strike” military training (1960s), and off-highway-vehicle recreational use. The archaeologists for the applicant propose that the source of trash was not associated with a specific homestead, individual, or group but do not discuss which aspects of the site lead them to this conclusion.

The archaeologists for the applicant recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The resolution of the documentation for the deposit makes it difficult to assess the actual date range that it represents, and therefore its potential association with important historic themes. The information present suggests that this site consists of a single episode of domestic trash disposal to sometime after 1950. However, the details provided by the archaeologists for the applicant do not rule out the possibility that this is a dual component site which includes a deposit associated with the DTC/C-AMA Cultural Landscape. Without further primary field data on the integrity of the deposit, possible use of these artifacts during World War II maneuvers, and potential evidence of characteristic military-style trash disposal practices (Bischoff 2000), staff cannot evaluate the site sufficiently to reasonably dismiss the possibility that it may retain the potential to yield information important to history. Staff therefore recommends that site CA-Riv-9203H (P33-17772) be assumed eligible for listing in the NRHP and the CRHR, for the purpose of the present analysis.

Staff considers possible mitigation measures for GSEP impacts to this site and six other historic-period artifact scatters which are potentially contributing elements to the DTC/C-AMA Cultural Landscape (Historic District) below (see C.3.5.2.1.5., “Possible Mitigation Measures for Individual Sites“).

CA-Riv-9204H (P33-17773)

This site is an oblong historic-period refuse deposit approximately 3,156 square m (0.8 acres) in area. It is located near the southern boundary of the southeastern section of the proposed site footprint. Seasonal drainages were noted to the east and west of the site at unspecified distances. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The present site surface is composed of sand and gravel alluvium. Further details about the site surface are unspecified. The surface component of the site measures approximately 97 m east to west and 30 m north to south. This site consists of a sparse can scatter and two artifact concentrations approximately 88 m apart. Concentration 1 is located within the eastern portion of the site and measures approximately 20 m by 20 m. It consists of 8 hole-in-top cans with their tops cut off and 1 soluble coffee can. Concentration 2 is within the western portion of the site, 88 m west of Concentration 1. It measures approximately 12 m by 10 m and consists of 7 hole-in-top cans with the tops cut off and 1 machine-made, external-thread-lipped, clear glass jar, with “14 over 3824” Knox Glass Bottle Co. (c. 1932–1953) maker’s mark embossed on bottom. The remainder of the site includes a light scatter of 7 hole-in-top cans. In total, 24 historic-period artifacts were identified at the site. The site appears to be primarily a surface deposit with some partial subsurface artifacts, but the actual depth of the site has not been determined.

In additional to the field investigation, the archaeologists for the applicant also examined historic maps, BLM records, and other historic documents. They found no evidence of

any historic dwellings and/or structures on or within several miles of CA-Riv-9204H (P33-17773). The specific documentary sources examined for this site were unspecified. Artifact types and chronological indicators suggest that the refuse scatter is domestic in type, most likely from a single dumping episode, and dating from the mid 1930s to early 1950s. Additionally, the artifacts appear to represent common domestic food and/or military issue rations (e.g., the soluble coffee can).

The archaeologists for the applicant recommend that this site be found ineligible for listing in the NRHP, arguing that these items are unlikely to yield information important to the historic development of the region. They further point out that the artifacts at the site have been rearranged by erosion, and therefore do not offer the potential to yield information important to history. The resolution of the documentation for the deposit makes it difficult to assess the actual date range that it represents, and therefore its potential association with important historic themes. However, the information that is present suggests that this site may be a contributing element to the DTC/C-AMA Cultural Landscape. Without further primary field data on the integrity of the deposit, possible use of these artifacts during World War II maneuvers, and potential evidence of characteristic military-style trash disposal practices (Bischoff 2000), staff cannot evaluate the site sufficiently to reasonably dismiss the possibility that it may retain the potential to yield information important to history. Staff therefore recommends that site CA-Riv-9204H (P33-17773) be assumed eligible for listing in the NRHP and the CRHR, for the purpose of the present analysis.

Staff considers possible mitigation measures for GSEP impacts to this site and six other historic-period artifact scatters which are potentially contributing elements to the DTC/C-AMA Cultural Landscape below (see C.3.5.2.1.5., “Possible Mitigation Measures for Individual Sites“).

CA-Riv-9211H (P33-17780)

This site is a triangular-shaped historic-period refuse deposit approximately (808 square m (0.2 acres) in area. It is located near the center of the southeastern section of the proposed site footprint. Several seasonal drainages were noted to pass through the site in unspecified locations. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The present site surface is composed of sand and gravel alluvium. Further details about the site surface are unspecified. The surface component of the site measures approximately 37 m from east to west and 37 m from north to south. This site consists of a sparse scatter of 25 cans, bottles, and related fragments. The can assemblage includes 1 aluminum beverage can (pull tab, c. 1962–1978), 3 round key-opened food cans (key winder inscribed “ESTAB. 95 9/PACKED”), 1 large food can (46 ounces), and 1 small food can (12 ounces). The glass assemblage includes 1 clear glass “Coca Cola” bottle body and base fragment with an embossed base (Owens-Illinois c.1929 to approximately 1959), 1 brown glass bottle embossed base (Owens-Illinois c. 1929 to approximately 1959), and 15 brown and clear glass bottle fragments. In addition, 1 crown bottle cap and 1 1934 American ”wheat” penny were also noted. The site appears to be primarily a surface deposit, but the actual depth of the site has not been determined.

In addition to the field investigation, the archaeologists for the applicant also examined historic maps, BLM records, and other historic documents. They found no evidence of any historic dwellings and/or structures on or within several miles of CA-Riv-9211H (P33-17780). The archaeologists for the applicant could not associate the source of trash with a specific homestead and/or individual or group. The specific documentary sources examined for this site were unspecified. Artifact types and chronological indicators suggest that the refuse scatter is domestic in type, dating from the mid-1930s to the mid-1970s. Refuse could be associated with World War II training activities, and/or the combination of recent historic activities such as sheep and cattle ranching, "Desert Strike" military training (1960s), and off-highway-vehicle recreational use.

The archaeologists for the applicant recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The resolution of the documentation for the deposit makes it difficult to assess the actual date range that it represents, and therefore its potential association with important historic themes. However, the information that is present suggests that this site may be a contributing element to the DTC/C-AMA Cultural Landscape (Historic District). Without further primary field data on the integrity of the deposit, possible use of these artifacts during World War II maneuvers, and potential evidence of characteristic military-style trash disposal practices (Bischoff 2000), staff cannot evaluate the site sufficiently to reasonably dismiss the possibility that it may retain the potential to yield information important to history. Staff therefore recommends that site CA-Riv-9211H (P33-17780) be assumed eligible for listing in the NRHP and the CRHR, for the purpose of the present analysis.

Staff considers possible mitigation measures for GSEP impacts to this site and six other historic-period artifact scatters which are potentially contributing elements to the DTC/C-AMA Cultural Landscape (Historic District) below (see C.3.5.2.1.5., "Possible Mitigation Measures for Individual Sites").

CA-Riv-9213H (P33-17782)

This site is an oblong historic-period refuse deposit approximately 7,487 square m (1.9 acres) in area. It is located on the eastern boundary of the southeastern section of the proposed site footprint. A north-south trending seasonal drainage passes through the western half of the site. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The present site surface is described as sand and gravel alluvium. Further details about the site surface are unspecified. The surface component of the site measures approximately 117 m from east to west and 90 m from north to south. This site consists of a sparse scatter of 58 metal artifacts including 40 round, key-opened food cans (16 ounce), 10 condensed milk cans (14.5 oz, church-key-opened), 4 rectangular food cans, 2 soluble coffee cans, 1 one-gallon-size gas can, and 1 key winder inscribed "ESTAB. 95 9/PACKED." The site appears to be primarily a surface deposit with some partially buried artifacts, but the actual depth of the site has not been determined.

In addition to the field investigation, the archaeologists for the applicant also examined historic maps, BLM records, and other historic documents. They found no evidence of any historic dwellings and/or structures on or within several miles of CA-Riv-9213H

(P33-17782). The specific documentary sources examined for this site were unspecified. Artifact types and chronological indicators suggest that the refuse scatter is domestic in type, probably from a single dumping episode. In addition, the artifacts appear to represent common domestic food and/or military issue rations (e.g. soluble coffee can, key-wind-opened cans). The date range for these artifacts and the kind of activities that might have resulted in their disposal, are unspecified.

The archaeologists for the applicant recommend that this site be found ineligible for listing in the NRHP, arguing that these items are unlikely to yield information important to the historic development of the region. They further point out that the artifacts at the site have been rearranged by erosion and therefore do not appear to be associated with events that made a significant contribution to our history, or associated with the life of a significant person, and do not exhibit characteristics that would yield important information to history. The resolution of the documentation for the deposit makes it difficult to assess the actual date range that it represents and therefore its potential association with important historic themes. However, the information that is present suggests that this site may be a contributing element to the DTC/C-AMA Cultural Landscape (Historic District). Without further primary field data on the integrity of the deposit, possible use of these artifacts during World War II maneuvers, and potential evidence of characteristic military-style trash disposal practices (Bischoff 2000), staff cannot evaluate the site sufficiently to reasonably dismiss the possibility that it may retain the potential to yield information important to history. Staff therefore recommends that site CA-Riv-9213H (P33-17782) be assumed eligible for listing in the NRHP and the CRHR, for the purpose of the present analysis.

Staff considers possible mitigation measures for GSEP impacts to this site and six other historic-period artifact scatters which are potentially contributing elements to the DTC/C-AMA Cultural Landscape below (see C.3.5.2.1.5., “Possible Mitigation Measures for Individual Sites“).

CA-Riv-9214H (P33-17783)

This site is an irregularly shaped historic-period refuse deposit approximately 2,832 square m (0.7 acres) in area. It is located in the center of the northwestern section of the proposed site footprint. Several small seasonal drainages pass through the site in unspecified locations. The predominant vegetation on the site appears to be Mojave creosote bush scrub. The present site surface is described as sand and gravel alluvium alternating with hardpan. Further details about the site surface are unspecified. The surface component of the site measures approximately 49 m from east to west and 69 m from north to south. This site consists of a sparse scatter of 34 metal and glass artifacts. The metal assemblage includes 15 hole in-top cans (12 ounce), 15 24-ounce cans (opened with a rotary can opener), 1 pocket tobacco can, 1 metal chain link/hook, and 1 cylindrical container top etched “The J.B. Williams Co./Eft. 1850/Glastonbury Conn.U.S.A.” (possible shaving stick or talcum powder, c. 1853–1956). The glass assemblage consists of a single broken brown glass jar embossed “Vaseline/Chesebrough/New York.” The site appears to be primarily a surface deposit with some partially buried artifacts, but the actual depth of the site has not been determined.

In addition to the field investigation, the archaeologists for the applicant also examined historic maps, BLM records, and other historic documents. They found no evidence of any historic dwellings and/or structures on or within several miles of CA-Riv-9214H (P33-17783). The specific documentary sources examined for this site were unspecified. Artifact types and chronological indicators suggest that the refuse scatter is domestic in type, probably from a single dumping episode. In addition, the artifacts appear to represent common domestic food and/or military issue rations. The date range for these artifacts and the kind of activities that might have resulted in their disposal, are unspecified.

The archaeologists for the applicant recommend that this site be found ineligible for listing in the NRHP, arguing that these items are unlikely to yield information important to the historic development of the region. They further point out that the artifacts at the site have been rearranged by erosion, and therefore do not appear to be associated with events that made a significant contribution to our history, or associated with the life of a significant person, and do not exhibit characteristics that would yield important information to history. The resolution of the documentation for the deposit makes it difficult to assess the actual date range that it represents, and therefore its potential association with important historic themes. However, the information that is present suggests that this site may be a contributing element to the DTC/C-AMA Cultural Landscape (Historic District). Without further primary field data on the integrity of the deposit, possible use of these artifacts during World War II maneuvers, and potential evidence of characteristic military-style trash disposal practices (Bischoff 2000), staff cannot evaluate the site sufficiently to reasonably dismiss the possibility that it may retain the potential to yield information important to history. Staff therefore recommends that site CA-Riv-9214H (P33-17783) be assumed eligible for listing in the NRHP and the CRHR, for the purpose of the present analysis.

Staff considers possible mitigation measures for GSEP impacts to this site and six other historic-period artifact scatters which are potentially contributing elements to the DTC/C-AMA Cultural Landscape below (see C.3.5.2.1.5., “Possible Mitigation Measures for Individual Sites“).

CA-Riv-9228H (P33-17797)

This site is a roughly circular historic-period refuse deposit approximately 2,827 square m (0.06 acres) in area. It is located on the eastern boundary of the proposed linear facilities corridor approximately 1.5 miles directly north of I-10. A north-south trending seasonal drainage is located in an unspecified location within the site. The predominant vegetation on the site appears to be Mojave creosote bush scrub. No details about the present site surface were provided. The surface component of the site measures approximately 64 m from east to west and 60 m from north to south. This site consists of a sparse scatter of 21 metal and glass artifacts. The metal assemblage at the site includes 6 sanitary cans (crimp seam), 1 hole-in-top sanitary can, 1 rectangular can (possibly for olive oil, with crimp seam, base embossed “URUGUAY”), 1 key-wind-opened can (embossed “ESTAB.315/PACKED/2”), 1 painted can (crimp seam, body painted with “NES”, snap/friction lid imprinted “Keep Tightly Closed”), and 1 GEM BLADE razor blade (“PAT 1739280” c. 1929 and later). The glass assemblage includes 5 aqua Coca Cola bottle fragments (1 base embossed “SAN BERNARDINO CALIF” and

"BOTTLE PAT. D 105529," c. 1938–1951), and 5 or more clear glass bottle fragments including a base fragment with an "S"-in-star marker's mark (Southern Glass Company, Vernon, CA; c. 1916–1931). The site appears to be primarily a surface deposit, but the actual depth of the site has not been determined.

The archaeologists for the applicant do not propose a date range for this deposit or associated activities that might have resulted in its placement within the proposed site footprint. The archaeologists for the applicant further recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The resolution of the documentation for the deposit makes it difficult to assess the actual date range that it represents, and therefore its potential association with important historic themes. Staff notes that these artifacts date to within the period of significance for the DTC/C-AMA Cultural Landscape (Historic District), 1942 to 1944, suggesting that this site may be a contributing element to the district. Without further primary field data on the integrity of the deposit, possible use of these artifacts during World War II maneuvers, and potential evidence of characteristic military-style trash disposal practices (Bischoff 2000), staff cannot evaluate the site sufficiently to reasonably dismiss the possibility that it may retain the potential to yield information important to history. Staff therefore recommends that site CA-Riv-9228H (P33-17797) be assumed eligible for listing in the NRHP and the CRHR, for the purpose of the present analysis.

Staff considers possible mitigation measures for GSEP impacts to this site and six other historic-period artifact scatters which are potentially contributing elements to the DTC/C-AMA Cultural Landscape below (see C.3.5.2.1.5., "Possible Mitigation Measures for Individual Sites").

C.3.5.1.3.8.3. Multiple-Component Archaeological Sites Evaluations

CA-Riv-9205H (P33-17773)

This is an oblong dual component site measuring 3,844 square m (1 acre) in area. It is located near the southern boundary of the southeast portion of the proposed GSEP site footprint, approximately 116 m south of CA-Riv-9204H (P33-17773). The predominant vegetation on the site appears to be Mojave creosote bush scrub. The present site surface is a slightly raised alluvial terrace of desert pavement. The surface component of the site measures approximately 66 m from east to west and 100 m from north to south.

The more particular physical context for site CA-Riv-9205H, extrapolating information from Cultural Resources Figure 1 to the location of the site, appears to be within the lake deposits of the Ql unit between the 377-foot shoreline and the 370-to–373 foot shoreline (see "Present Process Geomorphology" and "Results of Geoarchaeological Investigations" subsections, above). The possibility of buried cultural resources within the lake deposits is expected to be moderate. However, the depth of these deposits is undetermined. This site is also located in the valley between the McCoy Mountains and Palen Mountains where steeper slopes result in higher-energy sheet wash and in correspondingly poorer preservation of the spatial associations that reflect the behavior of people who made, used, or discarded archaeological materials. Nonetheless,

subsurface materials that offer the potential to yield information important to prehistory or history may be present here.

The prehistoric component consists of a light scatter of 8 prehistoric artifacts in the southern portion of the site. The artifacts present include 1 obsidian interior flake, 3 cortical chert flakes, 1 interior basalt flake, 2 quartz monzonite metate fragments, and 1 quartzite mano fragment. This component appears to be primarily a surface deposit, but its actual depth has not been determined.

The historic-period component forms a refuse concentration in the central portion of the site measuring 20 m from east to west and 37 m from north to south. The metal assemblage consists of 50 hole-in-top cans (16 oz, condensed milk, hole-punched), 5 crown bottle caps, 1 smashed metal box, 1 car lamp mount (etched “S+M Lamp Co./MADE IN USA/Los ANGELES/No. 28”), and 1 1983 American penny. The glass assemblage includes more than 50 clear glass bottle fragments (inc. 2 jar rims), more than 20 brown glass bottle fragments (6 bases and 1 jar with maker’s mark). Also present were 5 milky white ceramic dish fragments (melted). This component appears to be primarily a surface deposit, but its actual depth is unknown.

In addition to the field investigation, the archaeologists for the applicant also examined historic maps, BLM records, and other historic documents. They found no evidence of any historic dwellings and/or structures on or within several miles. The specific documentary sources examined for this site were unspecified. Artifact types and chronological indicators suggest that the refuse scatter is domestic in type, probably from a single dumping episode between the 1920s and 1960s. In addition, the artifacts appear to represent common domestic food and/or military issue rations. The kind of activities that might have resulted in the disposal of these artifacts, are unspecified.

The archaeologists for the applicant suggest no age or functional interpretation for the prehistoric component of this site. However, staff notes that the presence of ground stone may indicate a date of as early as the Late Archaic times (8000 to 6000 cal BC) or as late as the Late Prehistoric (1100 cal BC to Contact). The archaeologists recommend that this site be found ineligible for listing in the NRHP, but do not state their reasons for this recommendation. The sparse character of the surface assemblage and the apparent absence of materials that would facilitate the placement of the deposit in time seem to indicate that the site does not have the potential to yield information important to prehistory. Staff therefore recommends that the prehistoric component of site CA-Riv-9205 (P33-17431) is not eligible for listing in the NRHP or the CRHR.

The archaeologists for the applicant further recommend that the historic-period component should also be found ineligible for listing in the NRHP as it does not appear to be associated with events that made a significant contribution to our history, or with the life of a significant person, and does not exhibit characteristics that would yield additional important information to history. The resolution of the documentation for the deposit makes it difficult to assess the actual date range that it represents, and therefore its potential association with important historic themes. Staff notes that these artifacts date to within the period of significance for the DTC/C-AMA Cultural Landscape (Historic District), 1942 to 1944, suggesting that this site may be a contributing element to the district. Without further primary field data on the integrity of the deposit, possible

use of these artifacts during World War II maneuvers, and potential evidence of characteristic military-style trash disposal practices (Bischoff 2000), staff cannot evaluate the site sufficiently to reasonably dismiss the possibility that it may retain the potential to yield information important to history. Staff therefore recommends that site CA-Riv-9205 (P33-17797) be assumed eligible for listing in the NRHP and the CRHR, for the purpose of the present analysis.

Staff considers possible mitigation measures for GSEP impacts to this site and six other historic-period artifact scatters which are potentially contributing elements to the DTC/C-AMA Cultural Landscape below (see C.3.5.2.1.5., "Possible Mitigation Measures for Individual Sites").

C.3.5.1.3.8.4. Cultural Landscape Evaluations

A cultural landscape consists of "geographic area, including both natural and cultural resources, associated with a historic event, activity or person" (NPS 28). The National Park Service has defined four overlapping categories of cultural landscapes: historic designed, historic vernacular, historic site, and ethnographic. Historic designed landscapes are deliberate artistic creations, reflecting recognized styles, and are often associated with important builders, building trends, or events in the history of the construction of these kinds of landscapes. Historic vernacular landscapes illustrate people's values and attitudes towards the land and reflect patterns of settlement, use, and development over time. Historic sites are significant for their associations with important events, activities, and persons. Existing features and conditions are defined and interpreted in terms of what happened there at particular times in the past. Finally, ethnographic landscapes can be spaces rather than things that can be owned. These spaces or places are given meaning through their association with local and regional histories, cultural identities, beliefs, and behaviors. Ethnographic landscapes can include horizons, unmarked spiritual corridors, and places of connection between the earth's surface and the upper and lower realms. While these kinds of landscapes are often associated with Native Americans, they can be associated with any cultural group or belief system. Cultural landscapes can be determined eligible and nominated for inclusion on the NRHP, as either sites or districts. As such, these landscapes can be contiguous or noncontiguous (Evans et al. 2001; NPS 28). Staff has identified sites which are contributing elements to two noncontiguous cultural landscapes within the GSEP APEs.

The Prehistoric Trails Network Cultural Landscape

Energy Commission staff here proposes the designation of a cultural landscape that incorporates prehistoric archaeological sites associated with the Halchidhoma Trail (CA-Riv-53T), referred to here as the Prehistoric Trails Network (PTN) Cultural Landscape. This landscape consists of important destinations in the Colorado Desert near Blythe, CA; the network of trails that tie them together; and the features and sites associated with the trails.

In the 1990s McCarthy and a group of volunteers recorded 20 km of the Halchidhoma Trail as it curves around the southern and western side of the McCoy Mountains leading from the Blythe Intaligos (geoglyphs) to McCoy Spring. They identified 227 trail-associated sites and subsidiary trails associated with the Halchidhoma Trail. Staff

proposes to use the definitions and site types described in McCarthy's report (1993) as the basis of the boundaries, thematic associations, property types, and significance period of the PTN Cultural Landscape. The boundaries of this cultural landscape will need to be refined, but in broad terms it extends along the historically known route of the Halchidhoma Trail from where it begins near Blythe at the Colorado River, continuing to the west through the Chuckwalla Valley towards modern Los Angeles. The period of significance will also need to be refined, but it appears that the trail systems of southern California were used for thousands of years. Therefore, as a preliminary measure the period of significance is defined as the entire prehistoric and early historic periods. The thematic associations may also need to be expanded in the future, but currently include travel, trade, and ritual. Resource exploitation, particularly the collection of stone tool and ground stone raw materials, is also an important theme.

Characteristic site types for the PTN Cultural Landscape have been described by archaeologists working in the Colorado and Mojave Deserts for decades. Although the discussion here relies on McCarthy (1993), numerous other descriptions that are just as useful are available (Apple 2005; Cleland 2005). The following list is not comprehensive; it should be added to as needed as new patterns are discovered. The PTN site types are divided into three categories: destinations, trails, and trail-associated sites or features. Destinations primarily include water sources, but also include residential, religious, and resource-collection sites. Water-oriented destinations include natural features such as rivers, springs, lakes, rainwater tanks, as well as man-made wells. Residential sites include villages and camps with evidence of a full range of activities. Religious sites include geoglyphs and petroglyphs. The importance of particular destinations is indicated by the web of multiple trails that converge on certain places, often mountain passes or water sources. Trails can either be created by the movement of traveling feet or formally constructed. They average 30 centimeters in width and can be traced for many kilometers, interrupted only by gullies and washes. Trails are usually the shortest and most convenient routes from one point on the landscape to another. Trails are frequently associated with other features or sites including: concentrations of ceramics/pot drops, cleared circles, rock rings, rock clusters, rock cairns, rock alignments, petroglyphs, and geoglyphs. When the trail itself is not preserved, its route can often be traced by distinctive patterns of trail-associated sites and features.

The foundation of this cultural landscape would be the 227 sites recorded by McCarthy including McCoy Spring and McCoy Mountain Tanks A-D. Natural features that are likely to be associated with this cultural landscape include: the Colorado River, Ford Dry Lake, Palen Dry Lake, and possibly Corn Springs just south of Desert Center.
Other cultural resources should be added as a connection to the Halchidhoma Trail or the web of associated smaller trails can be demonstrated. Energy Commission staff identified potential contributors to the PTN Cultural Landscape using the following criteria:

1. The site consists entirely of prehistoric ceramics;

2. The site contains a concentration of ceramics similar to a "pot drop";

3. An existing trail leads in the direction of a site;

4. The site is near a steady supply of water;

5. The site is large, has evidence of a broad range of activities, and otherwise has evidence it was a habitation site; and/or

6. The site is a trail.

Energy Commission staff recommends that the PTN Cultural Landscape is eligible for listing on the NRHP under Criteria A and D and for the CRHR under Criteria 1 and 4. With respect to Criterion A/1, the Halchidhoma Trail was an essential trade, transportation, and ritual route for Native American peoples in the Colorado Desert during prehistoric times. This route was an essential connection between people living on the Pacific Coast and people living the Southwestern deserts of Arizona and New Mexico. In addition, Native American peoples of the region accord mythological importance to trail systems. Trails across the desert mark the locations of travels of ancestral groups as they migrated to the confluence of the Gila and Colorado Rivers. Trails also facilitate dream travel to these places and the times when events mentioned in story and song occurred (Cleland 2005, p. 132). As such, for both of these reasons this cultural landscape is significant under Criteria 1 (Criteria A), for its tie to important events in American history. However, most property types associated with the PTN exist today as archaeological resources, such as petroglyphs, pot drops, cleared circles, and webs of intersecting trails. These sites should be considered primarily register-eligible under Criterion D/4 for their ability to yield information important in history and prehistory.

Energy Commission staff concludes that GSEP impacts to the contributors to this cultural landscape, if unavoidable, must be mitigated.

Fifteen cultural resources identified during Tetra Tech's CHRIS survey of previous research in the GSEP vicinity and two cultural resources within the GSEP APEs are potentially contributing elements to the PTN Cultural Landscape (Cultural Resources Table 7). Site CA-Riv-9072 is considered eligible as an individual resource in addition to its possible contribution to the PTN. However, for site CA-Riv-9227, the information provided in the AFC was not sufficient to allow staff to be certain that this site is a contributor to the PTN. Therefore, staff recommends that this site be assumed eligible for inclusion in the NRHP and the CRHR.

CULTURAL RESOURCES Table 7
Potential Contributors to the Prehistoric Trails Network Cultural Landscape in the Vicinity of the GSEP

Resource Designation	Resource Description (type, age, content)	Location	Information Source
CA-Riv-53T	Prehistoric Primary Trail	20 km on south and west edges of McCarthy Mountains	McCarthy 1993
P-33-1516	Prehistoric Site: Large Temporary Camp along dry lake shoreline: ground stone, lithic scatter, thermal fractured rock. Some WW II military artifacts noted, no details regarding type.	GSEP vicinity	E. Ritter 1975
P-33-2159	Prehistoric Site: Temporary Camp/Lithic Scatter along gravel terraces of dry lake bed: metate/manos fragments, hammerstone/choppers, lithic flakes; rhyolite, basalt, chalcedony, agate, jasper, chert, granite, andesite.	GSEP vicinity	S. Cardenas 1981
P-33-663	Prehistoric Site: An extensive series of shoreline temporary camps: metate/mano fragments of green shale, fire affected rock, lithic reduction flakes (jasper, quartzite, rhyolite, chert, and chalcedony), pottery (Parker buff ware and Tizon brown ware, and greyware), rock alignment, 1 corner notched projectile point fragment, 1 biface fragment.	GSEP vicinity, shores of Dry Ford Lake	D. Pallette et al., 1989
P-33-1131	Prehistoric Site: Widely dispersed low density ceramic drop: 50 reddish-brown “Tizon” pottery shreds, 1 mano/core fragment.	GSEP vicinity	E. Dittman 1981
P33-001818	Prehistoric pottery fragments	GSEP vicinity	R. Carrico 1980
P33-3801	Prehistoric site: pottery scatter	GSEP vicinity	Pallette 1989
P33-003808	Prehistoric Site: ceramic scatter	GSEP vicinity	Mooney & Associates 1990
P33-003809	Prehistoric Site: ceramic scatter	GSEP vicinity	Mooney & Associates 1990
P-33-3129	Prehistoric trail segment	SW side of McCoy Mountains	F. McCarthy 1991
P33-00259	Prehistoric rock rings	GSEP vicinity	N. Gester 1965
CA-Riv-9064 (P33-17448)	Temporary Camp: Debitage (n=120+), projectile points, bifaces, and ground stone implements. Speculative chronology—possibly Archaic period.	GSEP vicinity	Farmer et al. 2009

Resource Designation	Resource Description (type, age, content)	Location	Information Source
CA-Riv-9072 (P33-17456)	Temporary Camp: Debitage (n=hundreds), FAR, Rose Spring projectile point, brownware sherds (n=hundreds) hundreds of ground stone fragments, scatter covers several hundred acres.	GSEP Site Footprint, shores of Dry Ford Lake	Farmer et al. 2009
CA-Riv-9078 (P33-17462)	Temporary Camp: Lithic scatter, ground stone, projectile points, bifaces, FAR. Site limits incompletely defined; extends east west and south beyond established boundary.	GSEP vicinity, shores of Dry Ford Lake	Farmer et al. 2009
CA-Riv-9079 (P33-17463)	Temporary Camp: Site limits incompletely defined. Debitage (n=500); ground stone, flake, core tools, and a marine clam shell fragment.	GSEP vicinity, shores of Dry Ford Lake	Farmer et al. 2009
CA-Riv-9227 (P33-17796)	Lithic and ceramic Scatter: Debitage (n=3); brownware sherds (n=14), marine shell fragment	GSEP vicinity	Farmer et al. 2009
CA-Riv-0132	McCoy Spring National Register District, focus of entire region during prehistoric times	West side of McCoy Mountains	McCarthy 1986, 1993

Desert Training Center California-Arizona Maneuver Area

Energy Commission staff here proposes the designation of a cultural landscape (historic district) that incorporates historical archaeological sites associated with Gen. Patton's World War II Desert Training Center California-Arizona Maneuver Area (DTC/C-AMA). The BLM has nominated this district to the NRHP several times. Each time the nomination was rejected mainly because the resource was not yet 50 years old at the time of the nomination. As part of the nomination process, BLM sponsored a detailed archaeological study of the resource which resulted in the publication of a cultural context (Bischoff 2000).

Staff notes that the resource is currently more than 50 years old and proposes to accept the boundary, thematic associations, property types, and significance period as laid out in Bischoff's (2000) context. The relevant themes include U.S. Preparation for World War II, U.S. Military Training, Gen. George S. Patton. Jr., and Gen. Walton Walker. Depots, airfields, ranges, bivouacs, maneuver areas, camps, and hospitals are among some of the property types included in the district. Following Bischoff (2000), the significance period is defined as 1942–1944.

Energy Commission staff recommends that Desert Training Center California-Arizona Maneuver Area (DTC/C-AMA) is eligible for listing on the NRHP and the CRHR under all four NRHP and CRHR eligibility criteria. The DTC/C-AMA was the largest and the only such military training facility in American military history. The training that took place here undoubtedly helped to win World War II. As such, it is significant under NRHP Criterion A (CRHR Criterion 1), for its tie to important events in American history. The facility was also central to the lives of people important in our past, specifically Gen. George S. Patton, Jr. and Gen. Walton Walker, both of whom served as facility commanders. Therefore the DTC/C-AMA is eligible for listing on the NRHP under

Criterion B (CRHR Criterion 2). The distinctive layouts of the camps and of maneuver areas are also clearly examples of a distinctive type of construction making the DTC/C-AMA eligible for listing in the under NRHP Criterion C (CRHR Criterion 3). However, most property types associated with the DTC/C-AMA exist today as archaeological resources such as refuse deposits, tank tracks, foxholes, and bivouacs. These sites will be considered primarily eligible under NRHP Criterion D (CRHR Criterion 4) for their ability to yield information important in history.

Military records report that the Chuckwalla Valley and portions of the proposed project were primarily used as maneuver areas, campsites, and small group training areas. Here soldiers practiced desert survival and infiltration techniques. The remains of these smaller exercises are undoubtedly more ephemeral than those involving 15,000 men, however, evidence may still be present. Artifacts and features associated with them will most likely be shell casings, grenade containers, foxholes, C-ration cans, and other refuse (Bischoff 2000, p .116). Wiley's Well was used as a campsite on multiple occasions. The presence of water at the site undoubtedly contributed to its importance. During maneuvers in 1943, the signal company's pigeon detachment set up a false camp at Wiley's Well, fooling the opposing side into thinking that there was a full headquarters at the camp (Bischoff 2000, p. 117). Evidence of these specific activities may still be present within the GSEP site footprint.

Seven sites already identified within the GSEP site footprint and the linear facilities corridor are potentially contributing elements to the DTC/C-AMA Cultural Landscape (Historic District) (see Cultural Resources Table 6). The information provided in the AFC was not sufficient to allow staff to determine the eligibility of these resources. Therefore, staff recommends that these sites be assumed eligible for inclusion in the NRHP and the CRHR.

C.3.5.1.3.8.5. Ethnographic Resource Evaluation

Staff includes McCoy Spring National Register District (CA-Riv-132) as a potential ethnographic resource that may be indirectly affected by the proposed project. The site is located on the west side of the McCoy Mountains approximately 5 miles from the Wiley's Well Rest Area. Access to the GSEP site footprint and linear facilities corridor for construction workers and permanent staff will share the rest area as an access point. Possible effects to the site include vandalism as the result of increased visitation and changes in the integrity of setting, integrity of feeling, and integrity of association.

This resource is already listed on the NRHP and the CRHR. It was nominated in the 1980s under Criterion D (similar to CRHR Criterion 4) for its ability to provide information important to the prehistory of the Mojave Desert. At this site, thousands of petroglyph elements are found on scattered outcrops, talus, and float boulders at the inflection of the bajada and the mountain face. The bajada is dissected by one major and several minor arroyos. Within an alcove in the largest arroyo is a small spring that was the focus of prehistoric Native American activity. Present-day vegetation is part of the creosote bush scrub plant community. Also present at the site is a midden deposit with ceramics, lithics, and ground stone. Portions of at least eighteen prehistoric trails and a prehistoric camp site with sleeping circles are also present. Historic-period

features noted at the site include an access road associated with nearby mining activities and historic cross-country automobile travel.

The significance of the site has been primarily associated with the petroglyphs. Present here are at least 2,141 boulders with over 3,360 rock art panels and at least 7,500 individual design elements, forming the largest concentration of petroglyphs in the region. No other recorded site within the region approaches the density, number, and aesthetic value of the petroglyphs found within the immediate area of McCoy Spring. Two important styles are represented at the site, the Great Basin Abstract style and the Colorado Desert Representational style (Hedges 1973). Also important is the presence of a midden at this site. Stratified trash deposits are rare in the region, and, as a result, each one of them holds the potential of yielding unique information on the prehistory of the California Desert. At the time of the nomination, the site integrity was good and vandalism was minimal. Protection of the site has been aided by the erection of a fence in the 1970s and an aluminum barrier across the road and major wash to prevent vehicle access to the petroglyphs. In the 1990s the historic district was the subject of a Master's thesis (McCarthy 1993) including additional survey and recording of rock art, trail segments, and associated sites. This report contains one of the most definitive analyses of prehistoric settlement patterns for the region. It determined that McCoy Spring was the focus of prehistoric activity for the entire region.

Staff proposes that McCoy Spring National Register District may be eligible for listing on the NRHP under Criterion A as well as under Criterion D. Under Criterion A, a resource is eligible if it is associated with "events that have made a significant contribution to the broad patterns of our history". In the context of a Native American site where its importance is not recorded in written form, National Register Bulletin 38 (NPS 1998, pp. 12–13) makes it clear that the word "our" refers to the group that finds the property significant and "history" includes both traditional oral and written history. Important events can include specific events, or repetitive trends. Places referred to in Native American oral histories and creation stories, therefore, are potentially eligible. Applying Criterion A to McCoy Spring, this place has clearly been an important place for hundreds if not thousands of years. Native American groups in the surrounding area consistently mention that springs, petroglyph sites, and trails are of special importance to their communities. McCoy Spring may be one of these places and may be impacted by the construction and operation of GSEP.

C.3.5.1.3.8.6. Built-Environment Resource Evaluations

To staff it appears that two linear built-environment resources in the proposed GSEP built-environment APE may be impacted by the project. These resources include a historic-period road and a historic-period electric transmission line. Descriptions and evaluations of the NRHP and CRHR eligibility of the two resources are presented below. The historian for the applicant recorded these two resources but did not provide any recommendations regarding their eligibility for listing on the NRHP or CRHR (Farmer et al. 2009, app. F).

Wiley's Well Road

Wiley's Well Road is a historic-period road that consists of both an unimproved dirt two-track owned and maintained by the BLM and a 40-foot-wide, two-lane paved road

owned and maintained by Riverside County. Transportation infrastructure associated with this road appears to include Wiley's Well, the I-10 overcrossing, Wiley's Well rest area, and possibly McCoy Spring. The road intersects with the proposed GSEP linear facilities corridor in two places, south of I-10 and near the Wiley's Well rest area. The paved portion of the road begins at Wiley's Well rest area, on the north side of I-10, and crosses I-10 heading south to Chuckwalla State Prison. The unimproved portion of the road extends north from Wiley's Well rest area between the Palen and McCoy Mountains in the direction of McCoy Spring and the abandoned mining town of Midland. A number of roads intersect near the Midland ghost town site, and the route of the road beyond this area is unclear. South of the Chuckwalla State Prison, the unimproved section of the road continues for 9 miles until it intersects with the old Bradshaw Trail. This is the location of Wiley's Well, which is currently a BLM campground and rock-hounding site. The road continues south through BLM land towards the Salton Sea.

Wiley's Well Road appears on historic maps in the 1930s after improvements were made to U.S. Highway 60-70, which it intersects. During this period, Wiley's Well Road was an unimproved dirt and gravel road. Historic maps indicate that by 1951 Wiley's Well Road had been improved and was a graded dirt road for the first five miles south of Highway 60-70 and continued southerly as an unimproved road. The road was improved when it was extended north, past Highway 60-70, to connect with roads that traversed the Palen and McCoy Mountains in the direction of McCoy Spring and the mining town of Midland. Improvements were again made to Wiley's Well Road in 1969 when part of the alignment of Highway 60-70 became I-10 when that freeway was constructed. Wiley's Well overcrossing was constructed over both eastbound and westbound lanes of I-10, and a portion of Wiley's Well Road was paved; the remainder was left as a dirt road. In 1987, Wiley's Well Road was again improved when Chuckwalla State Prison was constructed. The prison can be accessed from Wiley's Well Road and is to the southwest of the Wiley's Well Road interchange with I-10. The alignment of Wiley's Well Road has remained the same over time (Farmer et al. 2009, app. F).

Wiley's Well Road is associated with three historic migrations tied to mining discoveries in southern California and nearby parts of Arizona. First, this road is important as an offshoot of the Bradshaw Trail. This was an overland stage route pioneered by William Bradshaw in 1862 connecting San Bernardino, via San Gorgonio Pass, Palm Springs, and the north shore of the Salton Sea, eventually reaching the Colorado River near Blythe. This route followed traditional Indian trails and was used between 1862 and 1877 to transport miners and other passengers to the gold fields at La Paz (Ehrenberg), Arizona. A second mining boom in the Blythe area began in 1907. Wiley's Well Road was named for A. P. Wiley, storekeeper and postmaster in Palo Verde (just south of Blythe). Wiley financed miners prospecting in the area and in 1907 financed an expansion of the well first established 1896 by a stagecoach company using the Bradshaw Trail. The well was used by cattle ranchers, prospectors, and early automobile travelers until the rapidly falling water table made the water difficult to access and too salty to drink (Farmer et al. 2009, app. F). Around this same time, gypsum was found in the McCoy Mountains. A mining town, Midland, was established here. From 1925 to the 1960s, Midland was a company town owned by the U.S. Gypsum Co. The company harvested vast amounts of gypsum from the area. At its peak, the town had a population of approximately 1,000. The improvements to Wiley's

Well Road in the 1940s and 1950s appear to extend the road past McCoy Spring to Midland.

Based on the information above, staff concludes that Wiley's Well Road is associated with important historic trends in regional community and economic development. There appear to be two periods of significance. The first period is 1862 to 1877, when the road was associated with the Bradshaw Trail and the gold mines in La Paz, Arizona. The second period of significance was between 1907 and the 1960s when the road was a transportation corridor to the gypsum mines of Midland. During both of these periods the road was an unimproved, dirt two-track road crossing a relatively empty and forbidding desert. As such, staff suggests that the paved sections of Wiley's Well road and their associations with the rest area, I-10, and Chuckwalla State Prison do not retain integrity of setting, integrity of feeling, or integrity of association. However, the unimproved sections of Wiley's Well Road do appear to retain integrity of the rural desert two-track road, and are therefore eligible for listing on the NRHP under Criterion A and the CRHR under Criterion 1.

Wiley's Well Road does not appear to be eligible for listing on the NRHP or the CRHR under any other criteria. Although the well was named after A. P. Wiley and the road after the well, the road gets its main significance from its association with the Bradshaw Trail and the mining boom in La Paz, rather than an association with this individual. Therefore, the road does not appear to be eligible for listing on the NRHP under Criterion B and the CRHR under Criterion 2. According to the documentation provided by the historian for the applicant, both the unimproved dirt and paved portions of the road were built using standard construction techniques. Therefore the road does not appear to embody a distinctive type, period, or method of construction, and is not eligible for listing in the NRHP under Criterion C and the CRHR under Criterion 3. Finally, the road and its associated transportation infrastructure are also not eligible for the NRHP under Criterion D or for the CRHR under Criterion 4 because they do not appear to contain important scientific data related to our history.

Blythe-Eagle Mountain Transmission Line

The 161-kV Blythe-Eagle Mountain Transmission Line runs 52.1 miles from Blythe-Eagle Mountain Substation to Dunes Substation in Blythe. It was built in the 1950s using H-frame wood poles, some of which were replaced in 2002. This linear resource intersects with the proposed linear facilities corridor where the transmission line cuts diagonally to the north avoiding the Wiley's Well rest area.

The present electrical transmission line system operates in the 220–500-kV range. These lines move bulk power into and around the system to high-voltage substations in the area, where the power is converted down to sub-transmission levels of 115–33 kV. Before 1913, the highest voltage lines in the Los Angeles area were operated in the 10–75-kV range. Some of the earliest distribution lines were built to serve rural communities. During the 1930s any circuits built were those that extended lines previously constructed in the 1920s. Many of these lines focused on following railroad spur lines and existing distribution lines to growing communities. During the late 1920s, the Colorado River Valley, where the study area is located, was provided with electricity by Southern Sierras Power and its subsidiaries. With the end of WW II, a boom in

population occurred throughout the state. New industries and new residents came to California, including thousands of military men and their families. As populations grew, more utility customers were added, prompting Southern California Edison and other electrical companies to expand their services. This growth meant that more lines were constructed and extended. In the 1950s, when the Blythe-Eagle Mountain transmission line was constructed, Blythe had a large population, due to its fertile agricultural lands and the advent of the railroad and the automobile, which brought new residents to the area. In 1940 the population of Blythe was approximately 2,350, and by 1950 the population was over 4,000 (Farmer et al. 2009, app. F).

Generally speaking, electrical transmission and distribution facilities, as a mature technology, by themselves rarely meet the eligibility criteria for NRHP listing quoted above. Typically, those that are evaluated NRHP-eligible achieve that status by way of their association with other historically significant facilities (that is, eligible under Criterion A). Borrowed from telegraph transmission technology, wood-pole support structures such as those used in the 161-kV Blythe-Eagle Mountain Transmission Line have been used for electrical transmission or distribution lines from the outset, and the technology has changed very little. The common and non-distinctive nature of wood-pole transmission or distribution line structures disqualify them as potentially NRHP-eligible under Criterion C, being purely functional and utilitarian in use and common in appearance. A wood-pole transmission or distribution line could, however, be significant under Criterion A and/or Criterion B by way of an association with a significant facility (Taylor 2005).

Staff concludes that the 161-kV Blythe-Eagle Mountain Transmission Line is not eligible for inclusion in the NRHP or the CRHR. Evaluated under Criterion A/1, this linear resource is not associated with events that have made a significant contribution to broad patterns in our history. Rather it represents a common trend within the context of residential development of the United States after World War II. Research did not indicate that this transmission line was associated with any historically significant persons, and so it does not appear to be eligible under Criterion B2. Under Criterion C/3, this transmission line does not embody a distinctive type, period, or method of construction. Instead, it represents a fairly standardized type and construction method shared with telegraph lines. This resource is also not eligible under CriterionD/4 because it is unlikely to yield information important to history.

C.3.5.1.3.8.7. Summary of NRHP- and CRHR-Eligible Cultural Resources for the Genesis Solar Energy Project

Staff recommends four cultural resources presently in the GSEP site footprint and linear facilities corridor as eligible for listing on the NRHP and the CRHR. These resources are, consequently, historical resources for the purposes of CEQA. These resources are the DTC/C-AMA Cultural Landscape (Historic District), the PTN Cultural Landscape, archaeological site CA-Riv-9072 (which is also a contributor to the PTN Cultural Landscape), and built-environment resource Wiley's Well Road. However, the eligible portion of the Wiley's Well Road is not within the built-environment APE, and is therefore not expected to be impacted. In addition, there is currently one cultural resource, McCoy Spring, which is already listed on the NRHP and the CRHR. This resource is also a contributor to the PTN Cultural Landscape. Assessments of the

character of the impacts of the proposed project on these resources, and a preview of possible mitigation measures for GSEP impacts to these resources is presented below.

There are presently 14 further resources in the proposed GSEP site footprint and linear facilities corridor that staff assumes are eligible for listing in the NRHP and the CRHR for the purpose of the present siting case. These resources include 7 prehistoric sites, 6 historical archaeological sites, and the historic-period component of 1 multi-component site. Two of the prehistoric sites may be contributing elements to the PTN Cultural Landscape (see Cultural Resources Table 6). The historical archaeological sites may be contributing elements to the newly defined Desert Training Center California-Arizona Maneuver Area Cultural Landscape (Historic District). By benefit of the above assumption, these resources are historical resources under CEQA, and the consideration of the character of the impacts of the proposed project on them is a requisite part of the present analysis. Some aspects of a potential program to mitigate those impacts are presented below.

C.3.5.2. Assessment and Mitigation of Impacts

Staff's assessment of the impacts/effects on cultural resources of an action (the proposed project), including direct, indirect, and cumulative impacts, was discussed above, as "Assessing Action Effects," under "Methodology and Thresholds for Determining Environmental Consequences." Staff's determination of appropriate mitigation of significant impacts/effects is also discussed above, as "Resolving Significant Effects," under "Methodology and Thresholds for Determining Environmental Consequences."

C.3.5.2.1. Construction

Under "approach 3," all project-related direct, indirect, and cumulative construction impacts to known cultural resources located in the APEs that the Energy Commission staff and the BLM archaeologist did not determine to be ineligible for either the NRHP or the CRHR will be assumed to be significant. Similarly, staff also assumes that all direct, indirect, and cumulative construction impacts to yet-to-be-discovered cultural resources are significant. Staff recommends that these impacts be avoided or mitigated by means of data recovery, with specific modes of data recovery detailed in a programmatic agreement (PA), to be negotiated and signed by the BLM, the State Historic Preservation Officer, the Energy Commission, any Native American tribes or groups who opt to sign, and, possibly, the applicant.

This approach applies to all cultural resources inside the project's "impact block," entailing the full extent of the project's below-grade impacts (inclusive of all foundations and trenches) and above-grade impacts (inclusive of all above-ground facilities), and delimiting both the project's physical impacts to surficial and buried cultural resources and perceptual impacts to the settings of built-environment and ethnographic resources.

Staff asked NextEra to provide graphical representations of their potential "impact block," and received two figures showing the anticipated disturbance below ground and

the anticipated aboveground intrusion into the flat landscape. From these (TTEC 2010c, Sheets 1-6), staff concludes that:

- General cutting and filling would disturb the overall GSEP plant site to a maximum depth of 2 feet.
- In the solar array fields, GSEP collector foundation excavations would cause ground disturbance down to an unspecified depth, and the collectors would intrude into the flat landscape to a maximum height of 25 feet.
- In the power blocks, GSEP equipment foundation excavations would cause ground disturbance down to a maximum depth of 25 feet, and the equipment would intrude into the flat landscape to a maximum height of 75 feet.
- Along the linear facilities corridor, GSEP natural gas pipeline trench excavations would cause ground disturbance down to a maximum depth of 10 feet. The transmission line supports would cause ground disturbance down to a depth of 15 feet and create an intrusion into the flat landscape to a maximum height of 75 feet.

From this, staff has determined that all archaeological resources, recommended and/or assumed register-eligible, known and possibly yet to be discovered during construction, and located within the GSEP's impact block, would be significantly impacted and adversely affected by the GSEP's construction. In addition, staff has determined that all ethnographic resources, determined and/or assumed register-eligible, known and possibly yet to be discovered during construction, and located within the GSEP's impact block, would be significantly impacted and adversely affected by the GSEP's construction.

In contrast, staff found that the integrity of setting and integrity of feeling of all known built-environment resources, recommended register-eligible and located within the GSEP's impact block, would not be significantly impacted and adversely affected by the erection of the GSEP.

C.3.5.2.1.1. Applicant's Recommended Mitigation Measures

Tetra Tech provided recommendations for mitigation in their revised survey report (Farmer et al. 2009, p.88). They found that only one of the newly identified archaeological sites within the GSEP APEs was potentially eligible for the NRHP. They recommend that a test excavation program be conducted at prehistoric site CA-Riv-9072 in order to mitigate potential adverse affects to this site. If the site should prove to have extensive buried deposits they recommend that the project could be redesigned to avoid the site or that suitable data recovery measures could be taken. Further details of these data recovery measures were not provided.

C.3.5.2.1.2. BLM and CEC Required Resolution of Significant Effects

As noted above, the resolution of the significant effects of the GSEP would be set forth in a PA. The process through which the PA is created is under the management of the BLM Palm Springs Field Office, which has recently initiated it with an invitation to the national Advisory Council on Historical Preservation and to the State Historic Preservation Officer for California to consult. The BLM will also invite the Energy Commission, all concerned Native Americans, and, possibly, NextEra, to consult in the

drafting of the PA for the GSEP. Specific mitigation measures for the eligible and assumed-eligible cultural resources will be developed through the PA consultation process, so what staff presents below are some general ideas of what mitigation measures could eventually be included in the PA. The list below is neither complete nor exhaustive.

C.3.5.2.1.3. Possible Mitigation for Cultural Landscapes

PTN Cultural Landscape

Staff has assumed an eligible PTN Cultural Landscape exists in and around the GSEP APEs, the impacts to which must be mitigated. Potential mitigation could entail further research to determine the district boundaries and to specify the contributing resources. A GIS database would be especially useful in this regard. Another possibility would be to prevent possible vandalism of contributing elements within the BLM Palen-McCoy Wilderness by constructing a fence along the southern boundary of the Wilderness preventing vehicle traffic from entering the area. The cultural landscape extends beyond the boundaries and impacts of the GSEP, and its definition and management must encompass the remaining BLM-managed land where the landscape exists. A possible first step to managing the resource may be to formally nominate the PTN for listing on the NRHP as a cultural landscape.

DTC/C-AMA Cultural Landscape

The DTC/C-AMA is a designated California Historical Landmark (# 985). The DTC/C-AMA was nominated for listing in the NRHP in 1980, but the nomination did not adequately justify its eligibility, and it was not listed. Staff has assumed an eligible DTC/C-AMA Cultural Landscape (Historic District) exists in and around the GSEP APEs, the impacts to which must be mitigated. Potential mitigation for GSEP impacts to the DTC/C-AMA Cultural Landscape could entail further research to determine the district boundaries and to specify the contributing resources. The DTC/C-AMA Cultural Landscape extends beyond the boundaries and impacts of the GSEP, and its definition and management must encompass the remaining BLM-managed land where the landscape exists. A possible first step to managing the resource may be to re-nominate the DTC/C-AMA as a cultural landscape (historic district). The author of a recent and much-consulted study of the DTC/C-AMA (Bischoff 2000), Matt C. Bischoff, has proposed that approach (Bischoff 2009).

C.3.5.2.1.4. Possible Mitigation for Impacts to McCoy Spring National Register District, an Ethnographic Resource

Construction-related activities associated with GSEP have the potential to cause significant impacts to McCoy Spring National Register District. Staff expects these to be indirect impacts. Although McCoy Spring is approximately five miles from the nearest portion of the GSEP linear facilities corridor, the resource will be directly accessible from the planned GSEP staging area at Wiley's Well Rest Area. The proposed project will involve an average of 650 employees for 37 months (GSEP 2009a, p. 3-26). Traffic and off-road exploration of the areas surrounding the project site will undoubtedly increase. Improved accessibility often results in vandalism. Vandalism at an archaeological site whose significance is tied to NRHP Criteria D represents the partial loss of information that it is in the public interest to preserve.

Potential mitigation for vandalism impacts to the McCoy Spring National Register District could entail the development of an active monitoring program by a specialist in the prehistoric rock art of California. An additional protective measure might include the erection of a fence along the Palen-McCoy Wilderness boundary, preventing motorized vehicle access.

As discussed above, McCoy Spring may be a traditional cultural property (TCP). Building the proposed GSEP plant at the foot of the McCoy Mountains may have a significant adverse affect on the integrity of association, setting, and feeling of this resource. These impacts may be visual in nature or may cause damage that can only be determined by an expert in the behavior, beliefs, and knowledge germane to understanding the property's cultural significance. Only members of the community that value the resource culturally and/or spiritually can determine impacts and suggest possible mitigation. During the consultation with Native Americans that is part of the development process for the GSEP Programmatic Agreement, possible impacts to McCoy Spring would be considered from the perspective of Native Americans, and mitigation measures for these impacts could possibly be devised, based on recommendations by Native Americans. But significant unavoidable impacts that cannot be fully mitigated may be possible. A final determination on this issue would be in the Programmatic Agreement, included in the SSA/FEIS, along with mitigation measures, if any.

Cultural resources staff is not qualified to evaluate a site to determine if it is a TCP. Neither can staff determine impacts to the resource or suggest possible mitigation. However, one way to establish contact with groups or individuals who are qualified to make these determinations is to have an ethnographer formally evaluate McCoy Spring for its eligibility for listing on the NRHP under Criteria A, as a possible TCP.

C.3.5.2.1.5. Possible Mitigation Measures for Impacts to Individual Resources

C.3.5.2.1.5.1. Possible Mitigation for Impacts to Prehistoric Archaeological Sites

Construction activity on the main GSEP plant site and the proposed linear alignments is expected to cause the destruction of eight prehistoric-to-historic-period Native American archaeological sites. One of these sites, CA-Riv-9072, was identified as potentially eligible for inclusion in the NRHP and the CRHR by Tetra Tech. Energy Commission and BLM staff concur with this determination.

This site is expected to be partially destroyed by the proposed GSEP construction. Only a small portion of the 300 acres comprising CA-Riv-9072 is within the GSEP site footprint. This is the northeastern corner, a triangular-shaped piece measuring approximately 400 m long by 200 m wide. This part of the site is expected to be completely destroyed by GSEP construction during site grading, grubbing, and top-soil removal. The remainder of the site can probably be avoided by GSEP construction activities. In addition the preliminary design of the storm drainage system has an outlet near or within the site that may result in impacts from erosion. Finally, the remainder of the site contains artifacts that are of interest to the general public which are in danger of removal particularly during construction activities but also during operation. The potential destruction of this site as a result of the construction of the proposed project

would cause a substantial adverse change in the significance of a historical resource, and would therefore have a significant effect on the environment.

Potential mitigation to reduce the expected impacts listed above could entail a combination of data recovery for the portion of the site within the project footprint, and avoidance for the remainder of the site.

GSEP construction activity is also expected to destroy an additional seven prehistoric sites. Staff had insufficient information to make a determination on the NRHP or CRHR eligibility of these seven resources and so is assuming eligibility for both registers for them. Data insufficiencies included inconsistent or incongruous field recording and site form completion omissions. Also, many recorded artifacts were not analyzed for chronological and economic evidence, or, if they were, the information was not included in the site forms. Entry A13, “Site Interpretation” on the DPR 523A site forms, was consistently left blank. As a result some of the most important information about the archaeological sites was often missing from the forms.

Impacts to these resources would have to be avoided or mitigated by means of data recovery. Potential mitigation measures could entail in-field analysis of artifacts and limited excavation to determine the horizontal and vertical extent of the site. A system such as the California Office of Historic Preservation’s recordation program for small lithic scatters (CARIDAP) would be appropriate for some of these sites.

C.3.5.2.1.5.2. Possible Mitigation for Impacts to Historical Archaeological Sites

Construction activity on the main GSEP plant site and the proposed linear alignments is expected to cause the destruction of seven historic-period archaeological sites. Staff determined that these sites were not individually eligible for inclusion in the NRHP and the CRHR. However, if these sites were associated with the DTC/C-AMA Cultural Landscape, they would be eligible as contributing elements. Staff had insufficient information to be certain about this relationship.

Data insufficiencies included site form recording inconsistencies between recorders, seeming incongruities in the co-occurrence of certain can types, and the lack of discussion of possible military uses of some artifacts. As a result staff was concerned as to whether dateable can and bottle traits were correctly identified in the field. Misidentification could have resulted in sites that may date to the DTC/C-AMA era (1942-1944) being incorrectly interpreted as dating to the mid-twentieth century. Misidentification would also result in multi-component sites with some cans ostensibly dating to the mid twentieth-century and some to the DTC/C-AMA era having incorrect artifact counts if all the cans actually date to the DTC/C-AMA era. These uncertainties could contribute to problems in correctly determining contributors to an assumed-eligible DTC/C-AMA cultural landscape in two ways. First, it could result in not considering sites that could be contributors. Second, it could result in incorrect counts of artifacts and the subsequent disqualification of contributing elements when the basis for determination of contributors is the number of artifacts representing the period of significance.

Given these concerns, staff assumed that all historic period sites were eligible for listing on both the NRHP and CRHR for the purposes of the present siting case. The potential

destruction of these seven sites as a result of the construction of the proposed project would cause a substantial adverse change in the significance of what here is assumed to be a historical resource, and would therefore have a significant effect on the environment. As such, these impacts, if unavoidable, must be mitigated.

Potential mitigation for these impacts could include historic research in combination with in-field artifact analysis. Most archaeologists have little experience with World War II-era military artifacts, and so consulting with an expert would probably be useful.

C.3.5.2.1.5.3. Possible Mitigation for Impacts to Built-Environment Resources

C.3.5.2.1.5.3.1. Wiley's Well Road

No significant direct construction impacts to the eligible portions of Wiley's Well Road are presently confirmed. However, the GSEP linear facilities corridor has recently been redesigned. Possible project impacts to Wiley's Well Road need to be re-evaluated in the context of the new linear facilities corridor alignment. If the construction of the newly proposed GSEP linear facilities corridor would cause a substantial adverse change in the significance of Wiley's Well Road, then these impacts will need to be mitigated to less-than-significant levels. The details of these mitigation plans will be provided in the PA.

C.3.5.2.1.5.4. Possible Mitigation Measures for the Discovery of Buried Archaeological Deposits During Construction

Staff commonly recommends a set of standard measures providing for the contingency of discovering archaeological resources during construction and related activities. These measures usually include the following:

- Measure-1 requires a Cultural Resources Specialist (CRS) to be retained and available during construction-related excavations to evaluate any discovered buried resources and, if necessary, to conduct data recovery as mitigation for the project's unavoidable impacts on them.
- Measure-2 requires the project owner to provide the CRS with all relevant cultural resources information and maps.
- Measure-3 requires the CRS to write and submit to the Energy Commission Compliance Project Manager (CPM) a Cultural Resources Monitoring and Mitigation Plan (CRMMP).
- Measure-4 requires the CRS to write and submit to the CPM a final report on all cultural resources monitoring and mitigation activities.
- Measure-5 requires the project owner to train workers to recognize cultural resources and instruct them to halt construction if cultural resources are discovered.
- Measure-6 prescribes the monitoring, by an archaeologist and, possibly, by a Native American, intended to identify buried archaeological deposits.
- Measure-7 requires the project owner to halt ground-disturbing activities in the area of an archaeological discovery and to fund data recovery, if the discovery is evaluated as CRHR-eligible.

In Measure-6, staff commonly specifies the parts of a project site where ground disturbance must be monitored by an archaeologist and, possibly also, by a Native American. For GSEP construction, it is likely that staff would minimally recommend archaeological and Native American monitoring during grading and grubbing as potential buried cultural resources are expected within 2 feet of the present ground surface (TTEC 2010e).

C.3.5.2.2. Operation

During operation of the proposed project, if a leak should develop in the gas or water pipelines supplying the plant, repair of the buried utility could require the excavation of a large hole. Such repairs could impact previously unknown subsurface archaeological resources in areas unaffected by the original excavation. The PA will include provisions to mitigate impacts to unknown archaeological resources found during repairs that are made during the operation of the plant on the extant facility.

C.3.5.2.3. Project Closure and Decommissioning

Cultural resources within the proposed GSEP site footprint and linear facilities corridor are most likely present within the first 2 feet below the current ground surface (see "Present Process Geomorphology" and "Results of Geoarchaeological Investigations" subsections, above).The construction of GSEP is expected to destroy all known and unknown cultural resources within the site footprint and most of the linear facilities corridor. Therefore the closure and decommissioning of the proposed project is unlikely to cause additional impacts to known or previously unknown cultural resources. However, sites within the linear facilities corridor and near the boundary of the proposed project footprint may still exist after GSEP construction and associated archaeological data recovery. These sites may be impacted by activities associated with project closure and decommissioning.

Potential mitigation of these impacts could include active avoidance measures or monitoring.

C.3.6 CUMULATIVE IMPACTS

The data compilation for the cumulative analysis is ongoing, and that analysis will be included in the SSA/FEIS.

C.3.7. ALTERNATIVES

Genesis Solar, LLC, evaluated a range of ideas for potential renewable projects in Southern California in terms of location, linear facility routes, and design. It was particularly important to develop a project where the solar insolation values were high, the environmental impacts were low, at least 1,800 acres of contiguous land could be used, the land slope was less than three percent, and transmission lines were located within 25 miles of the solar electric generating facility (GSEP 2009a).

Taking into consideration the above requirements, Energy Commission staff experienced in analyzing power project alternatives devised five location/design alternatives for the GSEP, the cultural resources impacts of which were examined for this analysis:

- Reduced Acreage Alternative
- Dry Cooling Alternative
- No-Project/No-Action Alternative #1
- No-Project/No-Action Alternative #2
- No-Project/No-Action Alternative #3

In this subsection these alternatives are examined from the perspective of cultural resources, concluding with a comparison of alternatives and a recommendation of the alternative with the least impact. In terms of cultural resources within all evaluated project areas, it is assumed that any ground disturbance is likely to destroy the resources present there.

C.3.7.1. Reduced Acreage Alternative

The Reduced Acreage Alternative would essentially be Unit 1 of the proposed project, including a 125-MW solar facility located within the boundaries of the proposed project as defined by NextEra. This alternative is analyzed for two major reasons: (1) it eliminates about 50 percent of the proposed site footprint so all impacts are reduced, and (2) by eliminating the eastern solar field, it would reduce the water required for wet cooling by 50 percent. The boundaries of the Reduced Acreage Alternative are shown in Alternatives Figure 1.

C.3.7.1.1. Setting and Existing Conditions

This alternative is located entirely within the boundaries of the proposed project, so all of the aspects of the setting and existing conditions as set out above are also pertinent to this alternative except the project description. The project description for this alternative simply eliminates the eastern 125-MW solar field and relocates the gas yard approximately 1.75 miles northwest of its present location. As a result, the environmental setting consists of the western portion of the proposed project, as well as the area affected by the linear project components.

C.3.7.1.2. Assessment of Impacts and Discussion of Mitigation

Cultural resource surveys completed by the applicant identified 20 cultural resources within the Reduced Acreage Alternative site footprint (Cultural Resources Table 8). These cultural resources include 14 prehistoric Native American sites, 3 historic artifact scatters, 2 built environment resources, and 1 possible ethnographic resource.

As stipulated under “approach 3,” Energy Commission staff and the BLM archaeologist would assume that all known cultural resources located in the APEs and subject to project effects, are NRHP and CRHR eligible.

Staff would make recommendations that the impacts of this alternative on cultural resources would have to be avoided or mitigated by means of data recovery, with specific modes of data recovery detailed in a programmatic agreement (PA), to be negotiated and signed by the BLM, the State Historic Preservation Officer, the Energy Commission, any Native American tribes or groups who opt to sign, and, possibly, the applicant.

CULTURAL RESOURCES Table 8
Known Cultural Resources Located within the Reduced Acreage Alternative

Resource Type and Designation	Resource Description [type, size, age, data absences]	When Found	Period/ Era	Information Source
Prehistoric Archaeological Resources				
CA-Riv-9047 (P33-17431)	Lithic Scatter: Debitage (n=5)	New	Prehistoric	Farmer et al. 2009
CA-Riv-9048 (P33-17432)	Lithic Scatter: Debitage (n=10).	New	Prehistoric	Farmer et al. 2009
CA-Riv-9051 (P33-17435)	Lithic Scatter: Debitage (n=4), core.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9072 (P33-17456)	Temporary Camp: Debitage (n=hundreds), FAR, Rose Spring projectile point, brownware sherds (n=hundreds) hundreds of ground stone fragments, scatter covers several hundred acres.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9084 (P33-17468)	Temporary Camp: Debitage (n=21), ground stone, and an olivella shell bead.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9215 (P33-17784)	Lithic Scatter: Debitage (n=10), concave-base projectile point.	New	Prehistoric	Farmer et al. 2009
CA-Riv-9217 (P33-17786)	Lithic Scatter: Debitage (n=3),	New	Prehistoric	Farmer et al. 2009
CA-Riv-9218 P33-17787)	Lithic Scatter: Debitage (n=2), scraper	New	Prehistoric	Farmer et al. 2009
CA-Riv-9219 (P33-17788)	Lithic Scatter: Debitage (n=3)	New	Prehistoric	Farmer et al. 2009
CA-Riv-9220 (P33-17789)	Lithic Scatter: Debitage (n=92), metate fragment, projectile point tip, Cottonwood projectile point	New	Prehistoric	Farmer et al. 2009
CA-Riv-9221 (P33-17770)	Lithic Scatter: Debitage (n=7).	New	Prehistoric	Farmer et al. 2009
CA-Riv-9223 (P33-17772)	Lithic Scatter: Debitage (n=16).	New	Prehistoric	Farmer et al. 2009
CA-Riv-9227 (P33-17796)	Lithic and ceramic Scatter: Debitage (n=3); brownware sherds (n=14), marine shell fragment	New	Prehistoric	Farmer et al. 2009
Ethnographic Resources				
(CA-Riv-0132)	McCoy Spring National Historic District	Previously known	Prehistoric	McCarthy 1986

Resource Type and Designation	Resource Description [type, size, age, data absences]	When Found	Period/ Era	Information Source
Historical Archaeological Resources				
CA-Riv-9214H (P33-17783)	Refuse Scatter: Approximately 10 cans.	New	Historic	Farmer et al. 2009
CA-Riv-9228H (P33-17797)	Refuse Scatter: 10 cans, bottle base (1938-1951), bottle base (1916-1931), razor blade, glass fragments	New	Historic	Farmer et al. 2009
Built-Environment Resources				
No number	Blythe-Eagle Mountain Transmission Line	New	Historic	Farmer et al. 2009, app. F
No number	Wiley's Well Road	New	Historic	Farmer et al. 2009, app. F

C.3.7.1.3. CEQA Level of Significance of Impacts

Staff would assume that all construction impacts, direct, indirect, and cumulative, to all eligible and staff-assumed-eligible cultural resources located in the APEs of this alternative would be significant and adverse under "approach 3."

The Reduced Acreage Alternative would result in significant direct impacts to 7 archaeological resources (Cultural Resources Table 8). Five of these resources are prehistoric Native American artifact scatters. One, CA-Riv-9072, is considered eligible for listing on the NRHP and the CRHR. Four other sites are assumed eligible for listing on the NRHP and the CRHR for the purposes of this siting case. Two of the three historic artifact scatters are also considered eligible for listing on the NRHP and the CRHR as potential contributing elements in the DTC/C-AMA Cultural Landscape. One of the built environment resources, Wiley's Well Road, is eligible for listing on the NRHP and the CRHR, but does not appear to be subject to any impacts. Finally, the Reduced Acreage Alternative has the potential to cause direct or indirect impacts to the McCoy Spring National Register District. As discussed previously, McCoy Spring may be a TCP. It needs to be evaluated before the potential impacts to this resource can be determined.

Assessments of the character of the impacts of the proposed project on these resources and a proposal for a program to mitigate those impacts to less-than-significant will be part of the PA. As the Reduced Acreage Alternative would impact approximately half of the resources that the GSEP would impact, staff considers the impacts of the Reduced Acreage Alternative to be moderately reduced when compared with the proposed project. However, the Reduced Acreage Alternative has the identical potential for causing significant impacts that cannot be mitigated to the possible TCP, McCoy Spring. As such, staff considers the impacts to McCoy Spring of the Reduced Acreage Alternative to be equal to those of the proposed project.

CULTURAL RESOURCES Table 9
NRHP and/or CRHR-Eligible Known Cultural Resources for Which Avoidance or Mitigation of Project Impacts Would Be Required

Resource Type, Designation	Resource Description (type, size, age)	NRHP/ CRHR Eligibility
Prehistoric Archaeological		
CA-Riv-9072	Temporary Camp: 300 acres, features, 1000s artifacts. Potential contributor to the PTN Cultural Landscape.	Eligible
CA-Riv-9084	Temporary Camp: Debitage (n=21), ground stone, and an olivella shell bead.	Assumed Eligible
CA-Riv-9220	Artifact Scatter: Debitage (n=92), metate fragment, projectile point tip, Cottonwood projectile point.	Assumed Eligible
CA-Riv-9223	Artifact Scatter: Debitage (n=16).	Assumed Eligible
CA-Riv-9227	Artifact Scatter: Debitage (n=3); brownware sherds (n=14), marine shell fragment. Potential contributor to the PTN Cultural Landscape.	Assumed Eligible
Ethnographic		
	McCoy Spring National Historic District: largest petroglyph site in Mojave Desert, midden, multiple trails. Potential contributor to the PTN Cultural Landscape.	Listed on both
Historical Archaeological		
CA-Riv-9214H	Refuse Scatter: Approximately 10 cans. Potential contributor to the DTC/C-AMA Cultural Landscape.	Assumed Eligible
CA-Riv-9228H	Refuse Scatter: 10 cans, bottle base (1938-1951), bottle base (1916-1931), razor blade, glass fragments. Potential contributor to the DTC/C-AMA Cultural Landscape.	Assume Eligible
Built-Environment		
No Number	Blythe-Eagle Mountain Transmission Line	Not Eligible
No Number	Wiley's Well Road	Eligible

C.3.7.2.1. Dry-Cooling Alternative

This subsection identifies the potential impacts of using air-cooled condenser (ACC) systems rather than the wet-cooling towers proposed by NextEra for the Genesis project. It is assumed that the ACC systems would be located where the cooling towers

are currently proposed for each of the two 125-MW power blocks, as illustrated in Alternatives Figure 2 (see Section B.3). This alternative is analyzed because it would reduce the amount of water required for steam turbine cooling from 822 acre-feet per year to 66 acre-feet per year. This reduction in water use would reduce impacts to water supplies and biological resources.

Approximately 18 ACC fans would be required for each of the two solar fields. The 18 fans, or ACC's, would operate when the ambient temperature is above 50 degrees Fahrenheit. When the temperature is below 50 degrees Fahrenheit, only 10 of the fans would be used (GSEP 2009f). The 18 ACC fans described in the GSEP cooling study would have a length of approximately 279 feet, a width of approximately 127 feet, and a height of 98 feet (GSEP 2009f). However, based on the ACC preliminary designs for nearby solar thermal projects in similar ambient temperatures, an additional 11,690 square feet could be required for siting of the fans and the fans would be up to 120 feet in height. In addition to the ACC fans, NextEra would use a small Wet Surface Air Cooler when needed to provide auxiliary cooling during extremely hot days (GSEP 2009f).

C.3.7.2.2. Setting and Existing Conditions

This alternative is located entirely within the boundaries of the proposed project. It simply eliminates the use of wet-cooling towers and incorporates the use of air-cooled condensers (ACC) in the same location. As a result, the APEs would be the same as for the proposed project.

C.3.7.2.3. Assessment of Impacts and Discussion of Mitigation

In the Dry-Cooling Alternative, the ACC units would be located in the same place as the proposed cooling towers in an area that would be graded for construction parking and construction trailers. No additional ground disturbance would be necessary for the use of the ACC units. As such, no additional impacts to known and unknown cultural resources would be expected other than the impacts identified for the proposed project.

However, the ACC units would be approximately 98-120 feet tall. This would be more than twice as tall as any other GSEP structure (GSEP 2009a). As such, the ACC units would be slightly more visible than any other GSEP structure, depending on the viewing distance, so could increase visual impacts to TCPs or other archaeological sites. Given the distance from which these sites would generally be viewed, this additional height is not expected to create a more severe impact to cultural resources.

As stipulated under "approach 3," Energy Commission staff and the BLM archaeologist would assume that all known cultural resources located in the APEs and subject to project effects, are historically significant.

Staff would make recommendations that the impacts of this alternative on cultural resources would have to be avoided or mitigated by means of data recovery, with specific modes of data recovery detailed in a programmatic agreement (PA), to be negotiated and signed by the BLM, the State Historic Preservation Officer, the Energy Commission, any Native American tribes or groups who opt to sign, and, possibly, the applicant.

C.3.7.2.4. CEQA Level of Significance of Impacts

No new impacts to archaeological sites would be created by the Dry-Cooling Alternative. However, this alternative has the potential to cause increased visual impacts to possible TCP McCoy Spring because the dry-cooling tower is significantly taller than the wet-cooling tower. As such, staff considers the impacts to McCoy Spring to be somewhat increased when compared to the proposed project.

Staff would assume that all construction impacts, direct, indirect, and cumulative, to all eligible and staff-assumed-eligible cultural resources located in the APEs of the Dry-Cooling Alternative would be significant and adverse under "approach 3." Staff also assumes that the impacts to archaeological resources would be reduced to a less-than-significant level by the implementation of CUL-1 and the PA. During the consultation with Native Americans that is part of the development process for the GSEP PA, possible impacts to McCoy Spring would be considered from the perspective of Native Americans, and mitigation measures for these impacts could possibly be devised, based on recommendations by Native Americans. But significant unavoidable impacts to ethnographic resources (including TCPs) that cannot be fully mitigated may be possible. A final determination on this issue would be in the PA, included in the SSA/FEIS along with mitigation measures, if any.

C.3.7.3 No Project/No Action Alternative

The No Project Alternative under CEQA defines the scenario that would exist if the proposed project were not constructed. If the No Project Alternative were selected, the construction and operational impacts of the project would not occur. Crucially for cultural resources, the grading of the site would not take place. Further, this alternative would eliminate contributions to cumulative impacts to cultural resources in Riverside County and in the Mojave Desert as a whole. However, either solar or natural gas powered projects are reasonably expected to be constructed in the project vicinity in the foreseeable future.

Under NEPA, the No Action Alternative is used as a benchmark of existing conditions by which the public and decision makers can compare the environmental effects of the proposed action and the alternatives. Like the No Project Alternative described above, under the No Action Alternative, the impacts of GSEP would not occur.

BLM is considering two separate actions, whether to approve a plan amendment and whether to approve the proposed project or an alternative. The three No Project/No Action Alternatives are evaluated in this subsection.

C.3.7.3.1. No Project/No Action Alternative #1

Under this alternative, the proposed project would not be approved by the CEC and BLM, and 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 the CDCA Plan would not be amended 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. Staff considers impacts to cultural resources to be substantially reduced when compared with the proposed project.

C.3.7.3.2. No Project/No Action Alternative #2

Under this alternative, the proposed project would not be approved by the CEC 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 of the proposed project. Staff considers impacts to cultural resources to be substantially reduced when compared with the proposed project.

C.3.7.3.3. No Project/No Action Alternative #3

Under this alternative, the proposed project would not be approved by the CEC and BLM, and 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. Staff considers impacts to cultural resources to be substantially reduced when compared with the proposed Project.

C.3.7.4. Comparison of Alternatives and Recommendation of Least Impact CR Alternative

This subsection compares the effects on cultural resources by the proposed project and the five alternatives identified above, according to the requirements of NEPA, Section 106, and CEQA. Both CEQA and NEPA require analysis of a "reasonable range" of alternatives to the proposed Project. Various alternatives were considered during preparation of this Staff Assessment/EIS. Under NEPA, an EIS must devote "substantial treatment" to a reasonable range of alternatives considered in detail, including the proposed action, so that reviewers may evaluate the comparative merits (40 CFR 1502.14[b]). Accordingly, this SA/EIS co-equally analyzed the proposed action and two other alternatives that meet most of the proposed project objectives along with three variations of the combined No-Action (NEPA)/No-Project (CEQA) Alternative, which are described fully in the Alternatives section. This level of analysis is included to provide sufficient information and meaningful detail about the environmental effects of each alternative so that informed decision-making about cultural resources can occur. The alternatives that were carried through the analysis of impacts to cultural resources were the proposed project, the Reduced Acreage Alternative, the Dry-Cooling Alternative, and three No Project/No Action Alternatives.

As discussed above, the proposed project would result in significant direct impacts to 14 archaeological resources that can be mitigated to less-than-significant by the implementation of CUL-1 and the PA. However, impacts to ethnographic resources (including TCPs) may result in significant unavoidable impacts that cannot be fully mitigated.

The Reduced Acreage Alternative would result in significant direct impacts to 7 archaeological resources that can be mitigated to less-than-significant by following the measures outlined in the PA. As approximately half of the resources would be directly impacted, staff considers these impacts to be moderately reduced when compared with the proposed project. However, this alternative has the identical potential for causing significant unavoidable impacts to the possible TCP, McCoy Spring. As such, staff considers the impacts to McCoy Spring to be equal to the proposed project.

The Dry-Cooling Alternative would result in significant direct impacts to same 15 cultural resources as in the proposed project. These impacts can be mitigated to less-than-significant by following the measures outlined in the PA. This alternative has the potential to cause increased indirect visual impacts to possible TCP McCoy Spring because the dry-cooling tower is significantly taller than the wet-cooling tower. As such, staff considers the impacts to McCoy Spring to be somewhat increased when compared to the proposed project.

The No-Action/No-Project Alternative #1 would result in no significant direct or indirect impacts to any cultural resources. However, in the reasonably foreseeable future the GSEP site footprint and linear facilities corridor is likely to be developed for other projects, resulting in potential impacts to cultural resources. These impacts would vary depending on the kind of development proposed and the locations they propose to build. Staff considers impacts to cultural resources to be substantially reduced when compared with the proposed project.

Like Alternative #2, the No-Action/No-Project Alternative #2 would result in no significant direct or indirect impacts to any cultural resources. However, in the reasonably foreseeable future the site footprint is likely to be developed for other solar projects, resulting in similar potential impacts to cultural resources as the proposed project. Staff considers impacts to cultural resources to be substantially reduced when compared with the proposed project.

The No-Action/No-Project Alternative #3 would result in no significant direct or indirect impacts to any cultural resources. The CDCA Plan amendment would make the land unavailable for future solar development, avoiding the kinds of impacts associated with solar plants. However, other kinds of development at this site seem reasonably foreseeable. This development has the potential to have similar or even greater impacts to cultural resources, depending on the kind of development and the locations chosen. Staff considers impacts to cultural resources to be substantially reduced when compared with the proposed project.

Staff concludes that the alternative with the least impact to cultural resources is the No-Action/No-Project Alternative, followed by the Reduced Acreage Alternative. The alternative with the most impact to cultural resources is potentially the Dry-Cooling Alternative, depending on the results of consultation with Native American groups regarding the McCoy Spring TCP.

C.3.8. NOTEWORTHY PUBLIC BENEFITS

Significant direct physical impacts to cultural resources often result in the complete destruction of the resource. Mitigation of these impacts frequently involves the collection of information (data recovery). This analysis and interpretation of the data collected through archaeology teaches us about the lives of historic people. This knowledge of American history enriches the lives of the general public. Therefore, although an important resource is lost forever, some of the information about that resource is retained. This allows us to argue that these significant impacts can be mitigated to a less-than-significant level. Although mitigation measures can reduce most individual site impacts to less-than-significant levels, archaeological excavation and analysis cannot recover all the scientific values of a site.

Therefore, data collection does not always provide a public benefit. As an inherently destructive science, archaeology must walk a fine line between destruction and preservation. Some questions about ancient people can only be answered through excavation, which results in the destruction of the site excavated. But archaeological techniques improve rapidly, increasing the amount of information we might gather dramatically. Portions of sites must be preserved so they can be analyzed using these future, as-yet undeveloped, techniques. No professionally agreed-upon limits for this balance between destruction and preservation exist. Archaeologists consider the proportion of certain site types that still exist when determining the cumulative effects and possible public benefits of a project. If only a few such sites still exist undisturbed, then their destruction would be considered a significant impact that cannot be mitigated to less-than-significant levels.

In the case of the proposed GSEP, very little is known about the prehistory of the Mojave Desert. Even less is known in this specific area of the Mojave-Colorado desert interface area. All that we know comes from mainly surface manifestations of localized sites. Little to nothing has been done regarding the relationships between local sites, trails, quarries, and now ephemeral bodies of water (i.e. Lake Cahuilla, Ford Dry Lake, Palen Dry Lake) and the springs and oases along the I-10 corridor. Data recovery associated with the proposed project or its alternatives has the potential to contribute to our knowledge of the ancient peoples who lived near Ford Dry Lake. As such, data recovery may provide some public benefits in the form of information.

C.3.9. PROPOSED CONDITIONS OF CERTIFICATION/MITIGATION MEASURES

At this time, staff is recommending only one condition of certification for the GSEP:

CUL-1 The project owner shall comply with all the terms and requirements of the Genesis Solar Energy Project Cultural Resources Programmatic Agreement.

C.3.10. COMPLIANCE WITH LORS

If the possible set of seven discovery measures (above), **CUL-1**, and the programmatic agreement (above) are properly implemented, the proposed GSEP would result in a less-than-significant impact on known and newly found archaeological resources. However, impacts to ethnographic resources (including TCPs) may result in significant unavoidable impacts that cannot be fully mitigated.

Nonetheless, the project would be in compliance with the applicable state laws, ordinances, regulations, and standards listed in Cultural Resources Table 1.

The County of Riverside's General Plan has language promoting the general county-wide preservation of cultural resources. The programmatic agreement requires specific actions not just to promote but to effect historic preservation and mitigate impacts to all cultural resources in order to ensure NEPA and CEQA compliance. Consequently, if GSEP implements these conditions, its actions would be consistent with the general historic preservation goals of the County of Riverside.

C.3.11. CONCLUSIONS AND RECOMMENDATIONS

Staff concludes that the proposed GSEP would have a significant direct impact on 14 historically significant archaeological resources and possible significant unavoidable impacts on 1 ethnographic resource. These resources include 8 prehistoric to historic-period Native American archaeological sites; 2 prehistoric sites that are potential contributing elements to the Prehistoric Trail Networks Cultural Landscape; 7 sites that are potential contributing elements to a historic district, the Desert Training Center California-Arizona Maneuver Area (DTC/C-AMA) Cultural Landscape; and the ethnographic resource McCoy Spring National Register District.

The Reduced Acreage Alternative would have a significant direct impact on 7 of the 14 historically significant archaeological resources listed above and a significant indirect impact on 1 ethnographic resource. These resources include 5 prehistoric to historic-

period Native American archaeological sites; these include 2 prehistoric sites that are potential contributing elements to the Prehistoric Trail Network Cultural Landscape; 2 historic-period sites that are potential contributing elements to the DTC/C-AMA Cultural Landscape; and McCoy Spring National Register District.

The Dry-Cooling Alternative would have a significant direct and indirect impacts on the same 15 cultural resources listed above. However, indirect impacts on McCoy Spring National Register District may be potentially greater as a result of the increased height of the dry-cooling tower.

The three variations of the No Project/No Action Alternative would not impact any cultural resources. However, No Project/No Action Alternative #3 where the BLM would make the proposed site unavailable for future solar development has the potential for the least future impacts to cultural resources.

Staff recommends that the alternative that has the least impact on cultural resources is No Project/No Action Alternative followed by the Reduced Acreage Alternative. The proposed project and the Dry-Cooling Alternative have nearly identical impacts to cultural resources. If the possible set of seven discovery measures (above), **CUL-1**, and the programmatic agreement (above) are properly implemented, the proposed GSEP would result in a less-than-significant impact on known and newly found archaeological resources, including the Prehistoric Trail Network and DTC/C-AMA Cultural Landscapes.

However, the impacts to possible TCP McCoy Spring National Register District have not yet been determined. These impacts may cause damage that can only be determined by an expert in the behavior, beliefs, and knowledge germane to understanding the property's cultural significance. Only members of the community that value the resource culturally and/or spiritually can determine impacts and suggest possible mitigation. During the consultation with Native Americans that is part of the development process for the GSEP PA, possible impacts to McCoy Spring would be considered from the perspective of Native Americans, and mitigation measures for these impacts could possibly be devised, based on recommendations by Native Americans. But significant unavoidable impacts that cannot be fully mitigated may be possible. A final determination on this issue would be in the PA included in the SSA/FEIS, along with mitigation measures, if any.

C.3.12. REFERENCES

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L. GLOSSARY

CULTURAL RESOURCES LIST AND GLOSSARY

GENESIS Solar Energy Project

ACC	Air-Cooled Condenser
Act	Warren-Alquist Act of 1974
AD	After the Birth of Christ
ACEC	BLM Area of Critical Environmental Concern
AFC	Application for Certification
APE	Area of Potential Effects
BEPTL	Blythe Energy Project Transmission Line
BC	Before the Birth of Christ
BLM	Bureau of Land Management
cal	Radiocarbon (C14) dates that have been calibrated to compensate for fluctuating levels of atmospheric C14. Calibrated C14 dates correspond to calendar years. Calibrated dates are expressed as cal AD or cal BC, where "cal" indicates "calendar years" or "calibrated years."
CARE	Californians for Renewable Energy
CA-Riv-#	Archaeological site numbers assigned by a CHRIS Information Center
CCS	Cryptocrystalline Silicate (rocks such as flint, chert, chalcedony, or jasper that contain a high percentage of silica [SiO2], the primary compound that composes quartz.)
CDCA	California Desert Conservation Area, a land use planning unit defined by the BLM in 1980
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
Conditions	California Energy Commission Conditions of Certification

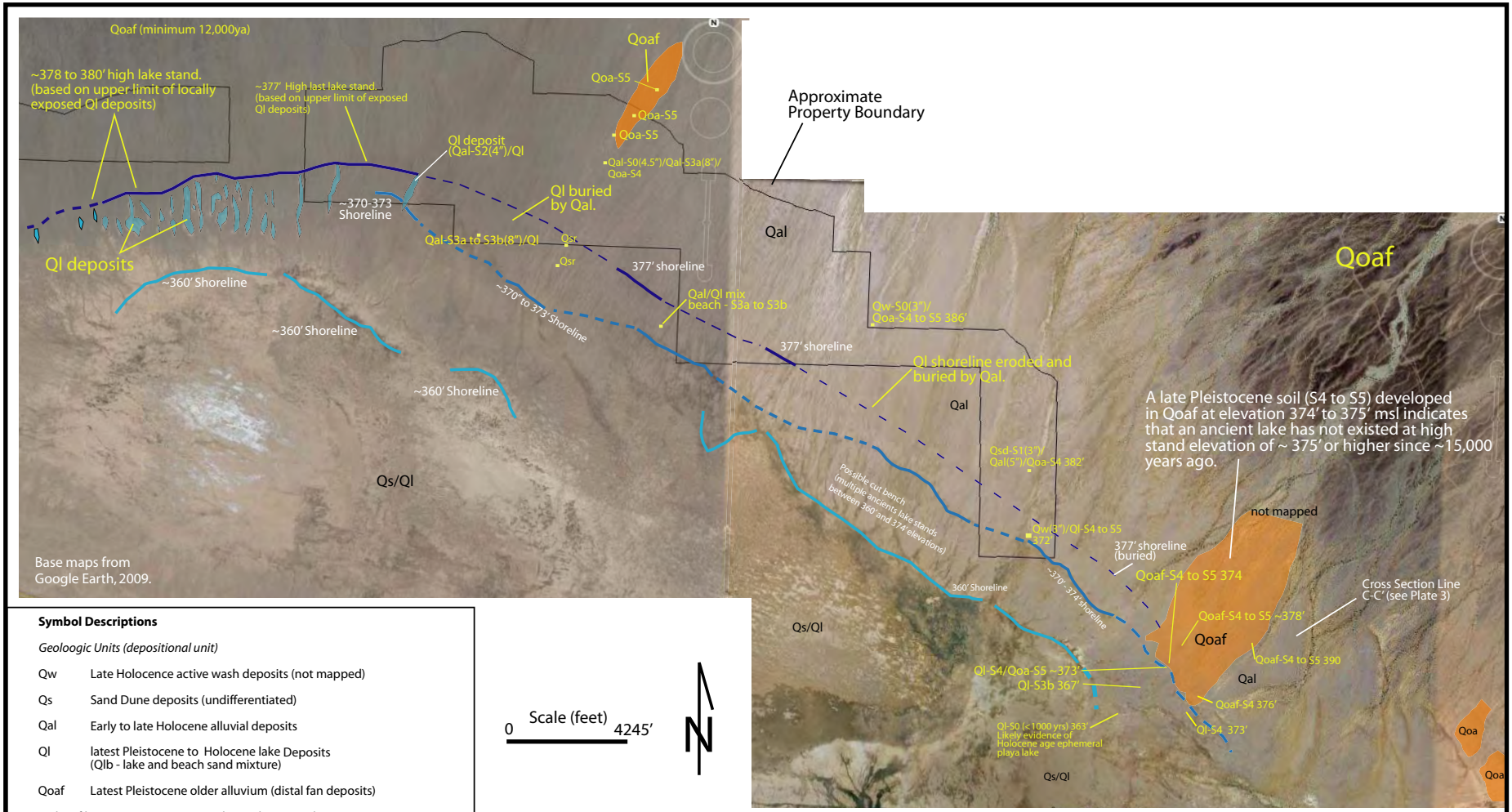
CRHR	California Register of Historical Resources
Criterion/a	The criteria for listing in the CRHR (1-4) or NRHP (A-D), if met a resource can be considered historically significant
CRM	Cultural Resources Monitor
DEIS	Draft Environmental Impact Statement
DPR 523	Department of Parks and Recreation cultural resources inventory form
DTC/C-AMA	World War II Desert Training Center/California-Arizona Maneuver Area
EIC	Eastern Information System, CHRIS, Department of Anthropology, University of California, Riverside
Eligible	A cultural resource need only be determined eligible for listing on the CRHR or the NRHP, using the criteria listed above, in order to be determined culturally significant
FAR	Fire-affected rock
Gen-Tie	Generation-tie, an intersection of two power transmission lines
GPS	Global Positioning System, a U.S. space-based global navigation satellite system
GSEP	proposed project, Genesis Solar Energy Project
Historical resource	A cultural resource that is historically significant and eligible for listing in the CRHR
Historic property	Federal language for all cultural resources that are historically significant and eligible for listing on the NRHP
I-10	Interstate 10
Integrity	The ability of a cultural resource to communicate its significance
kV	Kilovolts, 1000 volts
LORS	laws, ordinances, regulations, and standards
MLD	Most Likely Descendent, a term used to refer to who

	must be contacted when a an unmarked human skeleton is found
MOA	Memorandum of Agreement
MW	Megawatts
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission of California
NECO	Northern and Eastern Colorado Desert Coordinated Management, a multi-agency planning effort for the Sonoran Desert in California, amends the CDCA
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
ORBA	Off-Road Business Association
PA	Programmatic Agreement
Potentially eligible	A cultural resource that may be determined eligible for listing on the CRHR or NRHP after further archaeological study
Project Area of Analysis	The project site (see below) plus what additional areas staff defines for each project that are necessary for the analysis of the cultural resources that the project may impact.
Project Site	The bounded area(s) identified by the applicant as the area(s) within which they propose to build the project.
Section 106	Section 106 of the National Historic Preservation Act of 1966 requires Federal agencies to take into account the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. The historic preservation review process is outlined in the regulations entitled "Protection of Historic Properties" (36 CFR Part 800).
SHPO	State Historic Preservation Officer

Significant	In order to be eligible for listing on the NRHP a cultural resource must be evaluated using the four criteria to determine if the resource is significant
SLF	Sacred Lands File at the NAHC
Staff	Energy Commission cultural resources technical staff
SA	Staff Assessment
SSA/FEIS	Staff Supplemental Assessment/Final Environmental Impact Statement
TCP	Traditional Cultural Property, as described in the regulations for Section 106 of the NHPA, can be a site, structure, district, landscape, or natural feature that has traditional cultural significance, that is, significance based in the role the property plays in a community's historically rooted beliefs, customs, and practices.

CULTURAL RESOURCES - FIGURE 1

Genesis Solar Energy Project - Geomorphic Ancient Lake Shoreline Evaluation Map with Limited Geology, Ford Dry Lake, California



Symbol Descriptions

Geologic Units (depositional unit)

Qw	Late Holocence active wash deposits (not mapped)
Qs	Sand Dune deposits (undifferentiated)
Qal	Early to late Holocene alluvial deposits
Ql	latest Pleistocene to Holocene lake Deposits (Qlb - lake and beach sand mixture)
Qoaf	Latest Pleistocene older alluvium (distal fan deposits)

Soil Profile Designations (Stratigraphy) and Estimated Ages

S0	No soil profile observed (<1 Kya)
S1	1 to 3 ky
S2	3 to 5 ky
S3a	5 to 8 ky
S3b	8 to 12ky
S4	12 to 20ky
S5	20 or older

Nomenclature of Geologic Deposit and Soils

Qal-S2/Qoa-S4 = 3 to 5ky age soil formed in unit Qal, which overlies Quaternary Older alluvium with a soil profile with minimum age of 12 to 20 ky.

Note: All elevations utilized acquired by evaluating Google Earth.

SOURCE: WorleyParsons

C.4 – HAZARDOUS MATERIALS MANAGEMENT

Testimony of Alvin Greenberg, Ph.D.

C.4.1 SUMMARY OF CONCLUSIONS

U.S. Bureau of Land Management (BLM) and Energy Commission staff (hereafter jointly referred to as staff) evaluated the proposed Genesis Solar Energy Project (GSEP) in terms of hazardous materials use. Staff's analysis indicates that with implementation of staff's proposed mitigation measures, hazardous materials use at the site would not present a significant impact to the public. With adoption of the proposed conditions of certification, the proposed project will comply with all applicable laws, ordinances, regulations, and standards. Energy Commission staff proposes conditions of certification to address safe handling of hazardous materials, use of HTF, transportation of hazardous materials, and site security.

C.4.2 INTRODUCTION

The purpose of this Hazardous Materials Management analysis is to determine if the proposed GSEP has the potential to cause significant impacts on the public as a result of the use, handling, storage, or transportation of hazardous materials at the proposed site. If significant adverse impacts on the public are identified, Energy Commission staff must also evaluate the potential for facility design alternatives and additional mitigation measures to reduce those impacts to the extent feasible.

This analysis does not address the potential exposure of workers to hazardous materials used at the proposed facility. Employers must inform employees of hazards associated with their work and provide them with special protective equipment and training to reduce the potential for health impacts associated with the handling of hazardous materials. The **WORKER SAFETY AND FIRE PROTECTION** section of this document describes applicable requirements for the protection of workers from these risks.

For this analysis, staff examines plausible potential loss of containment incidents (spills) for the hazardous materials to be used at the proposed facility. The worst case plausible event, regardless of cause, is considered, and analyzed to see whether the risk to local populations is significant. Hazardous material handling and usage procedures are designed to reduce the likelihood of a spill, to reduce its potential size, and to prevent or reduce the potential migration of a spill off site to the extent that there won't be significant off-site impacts. These measures look at potential direct contact from runoff of spills, air-borne plume concentrations, and the potential for spills to mix with runoff water and be carried offsite. Generally, staff seeks to confirm that the applicant has proposed secondary containment basins for containing liquids, and that volatile chemicals would have a restricted exposure to the atmosphere after capture.

Various hazardous materials including mineral and lubricating oils, cleaning detergents, water treatment chemicals, heat transfer fluid (HTF), and welding gasses will be present at the proposed GSEP project. Although the GSEP project will not use natural gas for energy production, natural gas would be supplied to the site for the auxiliary boilers. The

project would connect to a Southern California Edison supply line via a new 6-mile pipeline (GSEP 2009a, Section 3.4.6). The GSEP project would also require the transportation of hazardous materials to the facility. This document addresses all potential impacts associated with the use and handling of hazardous materials.

C.4.3 METHODOLOGY AND THRESHOLDS FOR DETERMINING ENVIRONMENTAL CONSEQUENCES

Staff reviewed and assessed the potential for the transportation, handling, and use of hazardous materials to impact the surrounding community. All chemicals were evaluated. Staff's analysis addresses the potential impacts on all members of the population including the young, the elderly, and people with existing medical conditions that may make them more sensitive to the adverse effects of hazardous materials. In order to accomplish this goal, staff utilized the most current public health exposure levels (both acute and chronic) that are established to protect the public from the effects of an accidental chemical release.

In order to assess the potential for released hazardous materials to travel off site and affect the public, staff analyzed several aspects of the proposed use of these materials at the facility. Staff recognizes that some hazardous materials must be used at power plants. Therefore, staff conducted its analysis by examining the choice and amount of chemicals to be used, the manner in which the applicant will use the chemicals, the manner by which they will be transported to the facility and transferred to facility storage tanks, and the way the applicant plans to store the materials on site.

Staff reviewed the applicant's proposed engineering and administrative controls concerning hazardous materials usage. Engineering controls are the physical or mechanical systems, such as storage tanks or automatic shut-off valves, that can prevent the spill of hazardous material from occurring, or which can either limit the spill to a small amount or confine it to a small area. Administrative controls are the rules and procedures that workers at the facility must follow that will help to prevent accidents or to keep them small if they do occur. Both engineering and administrative controls can act as methods of prevention or as methods of response and minimization. In both cases, the goal is to prevent a spill from moving off site and causing harm to the public.

Staff reviewed and evaluated the applicant's proposed use of hazardous materials as described by the applicant (GSEP 2009a, Section 5.12). Staff's assessment followed the five steps listed below.

- Step 1: Staff reviewed the chemicals and the amounts proposed for on-site use as listed in Table 5.12-1 of the AFC (GSEP 2009a) and determined the need and appropriateness of their use.
- Step 2: Those chemicals proposed for use in small amounts or whose physical state is such that there is virtually no chance that a spill would migrate off site and impact the public were removed from further assessment.
- Step 3: Measures proposed by the applicant to prevent spills were reviewed and evaluated. These included engineering controls such as automatic shut-off valves

and different-sized transfer-hose couplings and administrative controls such as worker training and safety management programs.

- Step 4: Measures proposed by the applicant to respond to accidents were reviewed and evaluated. These measures also included engineering controls such as catchment basins and methods to keep vapors from spreading and administrative controls such as training emergency response crews.
- Step 5: Staff analyzed the theoretical impacts on the public of a worst-case spill of hazardous materials, as reduced by the mitigation measures proposed by the applicant. When mitigation methods proposed by the applicant are sufficient, no further mitigation is recommended. If the proposed mitigation is not sufficient to reduce the potential for adverse impacts to an insignificant level, staff will propose additional prevention and response controls until the potential for causing harm to the public is reduced to an insignificant level. It is only at this point that staff can recommend that the facility be allowed to use hazardous materials.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following federal, state, and local laws and policies apply to the protection of public health and hazardous materials management. Staff's analysis examines the project's compliance with these requirements.

Hazardous Materials Management Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
Federal	
The Superfund Amendments and Reauthorization Act of 1986 (42 USC §9601 et seq.)	Contains the Emergency Planning and Community Right To Know Act (also known as SARA Title III).
The Clean Air Act (CAA) of 1990 (42 USC 7401 et seq. as amended)	Established a nationwide emergency planning and response program and imposed reporting requirements for businesses that store, handle, or produce significant quantities of extremely hazardous materials.
The CAA section on risk management plans (42 USC §112(r)	Requires states to implement a comprehensive system informing local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of both SARA Title III and the CAA are reflected in the California Health and Safety Code, section 25531, et seq.
49 CFR 172.800	The U.S. Department of Transportation (DOT) requirement that suppliers of hazardous materials prepare and implement security plans.
49 CFR Part 1572, Subparts A and B	Requires suppliers of hazardous materials to ensure that all their hazardous materials drivers are in compliance with personnel background security checks.
The Clean Water Act (CWA) (40 CFR 112)	Aims to prevent the discharge or threat of discharge of oil into navigable waters or adjoining shorelines. Requires a written spill prevention, control, and countermeasures (SPCC) plan to be prepared for facilities that store oil that could leak into navigable waters.
Title 49, Code of Federal Regulations, Part 190	Outlines gas pipeline safety program procedures.
Title 49, Code of Federal Regulations, Part 191	Addresses transportation of natural and other gas by pipeline: annual reports, incident reports, and safety-related condition reports. Requires operators of pipeline systems to notify the DOT of any reportable incident by telephone and then submit a written report within 30 days.

Applicable Law	Description
Title 49, Code of Federal Regulations, Part 192	Addresses transportation of natural and other gas by pipeline and minimum federal safety standards, specifies minimum safety requirements for pipelines including material selection, design requirements, and corrosion protection. The safety requirements for pipeline construction vary according to the population density and land use that characterize the surrounding land. This part also contains regulations governing pipeline construction (which must be followed for Class 2 and Class 3 pipelines) and the requirements for preparing a pipeline integrity management program.
Federal Register (6 CFR Part 27) interim final rule	A regulation of the U.S. Department of Homeland Security that requires facilities that use or store certain hazardous materials to submit information to the department so that a vulnerability assessment can be conducted to determine what certain specified security measures shall be implemented.
State	
Title 8, California Code of Regulations, section 5189	Requires facility owners to develop and implement effective safety management plans that ensure that large quantities of hazardous materials are handled safely. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the Risk Management Plan (RMP) process.
California Health and Safety Code, section 41700	Requires that “No person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property.”
California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)	Prevents certain chemicals that cause cancer and reproductive toxicity from being discharged into sources of drinking water.
Hazardous Material Business Plan, Cal HSC Sections 25500 to 25541; 19 CCR Sections 2720 to 2734	Requires the submittal of a chemical inventory and planning and reporting for management of hazardous materials.
Hazardous Substance	Requires listing and implementation of specified control measures for management of hazardous substances.

Applicable Law	Description
Information and Training Act, 8 CCR Section 339; Section 3200 et seq., 5139 et seq., and 5160 et seq.	
California HSC Sections 25270 through 25270.13	Requires the preparation of a Spill Prevention, Control, and Countermeasures (SPCC) Plan if 10,000 gallons or more of petroleum is stored on-site. The above regulations would also require the immediate reporting of a spill or release of 42 gallons or more to the California Office of Emergency Services and the Certified Unified Program Authority (CUPA).
Process Safety Management: Title 8 CCR Section 5189	Requires facility owners to develop and implement effective process safety management plans when toxic, reactive, flammable, or explosive chemicals are maintained on site in quantities that exceed regulatory thresholds
Local	
Riverside County Fire Code, Riverside County Code Chapter 8.32: Ordinance No. 787	Adopts the California Fire Code, 2007 Edition, with some of its appendices, into Riverside County regulations.
Disclosure of Hazardous Materials and the Formulation of Business Emergency Plans: Riverside County Ordinance 651	Requires disclosure where businesses handle hazardous materials and requires the development of response plans; designates Riverside County Department of Environmental Health as responsible for administration and enforcement of local codes.

The Certified Unified Program Agency (CUPA) with the responsibility to review the Hazardous Materials Business Plan (HMBP) is the Riverside County Environmental Health Department (RCEHD). With regard to seismic safety issues, the site is located in a Seismic Zone 4. Construction and design of buildings and vessels storing hazardous materials will meet the appropriate seismic requirements of the 2007 California Building Code (GSEP 2009a, Section 5.12.2.3).

C.4.4 PROPOSED PROJECT

C.4.4.1 SETTING AND EXISTING CONDITIONS

Several factors associated with the area in which a project is to be located affect the potential for an accidental release of a hazardous material that could cause public health impacts. These include:

- local meteorology;
- terrain characteristics; and
- location of population centers and sensitive receptors relative to the project.

Meteorological Conditions

Meteorological conditions, including wind speed, wind direction, and air temperature, affect both the extent to which accidentally released hazardous materials would be dispersed into the air and the direction in which they would be transported. This affects the potential magnitude and extent of public exposure to such materials, as well as their associated health risks. When wind speeds are low and the atmosphere stable, dispersion is severely reduced but can lead to increased localized public exposure.

Recorded wind speeds and ambient air temperatures are described in the Air Quality section (5.2.1.3) and Appendix B.2 of the Application for Certification (GSEP 2009a).

Terrain Characteristics

The location of elevated terrain is often an important factor in assessing potential exposure. An emission plume resulting from an accidental release may impact high elevations before impacting lower elevations. The topography of the site is essentially flat (about 370 to 400 feet above sea level). Elevated terrain can be found at about 5-6 miles north and northwest of the site boundary where the Palen and McCoy mountains begin (GSEP 2009a, Sections 3.3 and Figure 3.2-1).

Location of Exposed Populations and Sensitive Receptors

The general population includes many sensitive subgroups that may be at greater risk from exposure to emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses. In addition, the location of the population in the area surrounding a project site may have a major bearing on health risk. Sensitive receptors in the project vicinity are listed in Table 5.15-1 of the AFC. There are no sensitive receptors within a 6-mile radius of the project site, and there are no residences or other public receptors within a 4-mile radius of the site (GSEP 2009a, Section 5.15.1). The Chuckwalla Valley and Ironwood State Prisons are located about nine miles south and the nearest schools or medical facilities are in Blythe, about 25 miles away (GSEP 2009a, 5.12.1.1).

C.4.4.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Small Quantity Hazardous Materials

In conducting the analysis, staff determined in Steps 1 and 2 that some hazardous materials, although present at the proposed facility, pose a minimal potential for off-site impacts since they will be stored in a solid form or in smaller quantities, have low mobility, or have low levels of toxicity. These hazardous materials, which were eliminated from further consideration, are briefly discussed below.

During the construction phase of the project, hazardous materials proposed for use include paint, solvents, gasoline, diesel fuel, motor oil, lubricants, and welding gases (GSEP 2009a, Section 5.12.2.2). No acutely toxic hazardous materials will be used on site during construction, and none of these materials pose significant potential for off-site impacts as a result of the quantities on site, their relative toxicity, their physical state, and/or their environmental mobility. Any impact of spills or other releases of these materials will be limited to the site because of the small quantities involved, their infrequent use (and therefore reduced chances of release), and/or the temporary containment berms used by contractors. Petroleum hydrocarbon-based motor fuels, mineral oil, lube oil, and diesel fuel are all very low volatility and represent limited off-site hazards even in larger quantities.

During operations, hazardous chemicals such as cleaning agents, water treatment chemicals, welding gasses, oils, activated carbon, and other various chemicals (see **HAZARDOUS MATERIALS APPENDIX A** for a list of chemicals proposed to be used and stored at GSEP during operations) would be used and stored in relatively small amounts and represent limited off-site hazards because of their small quantities, low volatility, and/or low toxicity. The project will be limited to using, storing, and transporting only those hazardous materials listed in Appendix A of this section as per staff's proposed condition **HAZ-1**.

After removing from consideration those chemicals that pose no risk of off-site impact in Steps 1 and 2, staff continued with Steps 3, 4, and 5 to review the remaining hazardous materials: natural gas and Therminol VP-1^{TM}.

Large Quantity Hazardous Materials

Natural Gas

Natural gas poses a fire and/or possible explosion risk because of its flammability. Natural gas is composed of mostly methane, but also contains ethane, propane, nitrogen, butane, isobutene, and isopentane. It is colorless, odorless, tasteless and lighter than air. Natural gas can cause asphyxiation when methane is 90% in concentration. Methane is flammable when mixed in air at concentrations of 5-14%, which is also the detonation range. Natural gas, therefore, poses a risk of fire and/or possible explosion if a release occurs under certain specific conditions. However, it should be noted that, due to its tendency to disperse rapidly (Lees 1998), natural gas is less likely to cause explosions than many other fuel gases such as propane or liquefied petroleum gas, but can explode under certain confined conditions (as demonstrated by the recent natural gas detonation in Belgium in July 2004).

Natural gas at the proposed facility would be used to fuel the auxiliary boilers. It will not be stored on-site but delivered by Southern California Edison via a new 6-mile pipeline that would connect to an existing main north of I-10 (GSEP 2009a, Section 3.4.6). The risk of a fire and/or explosion on site can be reduced to insignificant levels through adherence to applicable codes and the development and implementation of effective safety management practices. The National Fire Protection Association (NFPA) code 85A requires both the use of double-block and bleed valves for gas shut off and automated combustion controls. These measures will significantly reduce the likelihood of an explosion in gas-fired equipment. The safety management plan proposed by the applicant would address the handling and use of natural gas, and would significantly reduce the potential for equipment failure because of either improper maintenance or human error.

The natural gas pipeline must be designed to meet the appropriate level of California Public Utilities Commission (CPUC) General Order 112 standards and 49 CFR 192 standards. CPUC General Order 112-E, Section 125.1 requires that at least 30 days prior to the construction of a new pipeline, the owner must file a report with the commission that will include a route map for the pipeline. The natural gas pipeline must be constructed and operated in accordance with the Federal Department of Transportation (DOT) regulations, Title 49, Code of Federal Regulations (CFR), Parts 190, 191, and 192 (see Table 1 LORS). Staff concludes that existing LORS are sufficient to ensure minimal risks of pipeline failure.

Therminol VP-1

Therminol VP1 is the heat transfer fluid (HTF) that will be used in the solar panels to collect solar heat and transfer it in order to generate steam to run the steam turbines. Therminol is a mixture of 73.5% diphenyl ether and 26.5% biphenyl, and is a solid at temperatures below ~54 °F. Therminol can therefore be expected to remain liquid if a spill occurs. While the risk of off-site migration is minimal, Therminol is highly flammable and fires have occurred at other solar generating stations that use it. Approximately 2,000,000 gallons of HTF will be stored at the GSEP contained in the pipes and heat exchanger. Isolation valves would be placed throughout the HTF piping system designed to automatically block off sections of the piping in which a loss of pressure is detected (GSEP 2009a, Section 5.12.2.3).

Staff has assessed the properties of Therminol, and reviewed the record of its use at Solar Electric Generating Stations 8 and 9 at Harper Lake, California. Past leaks, spills, and fires involving this HTF were examined and discussed. It appears that the placement of additional isolation valves in the HTF pipe loops throughout the solar array would add significantly to the safety and operational integrity of the entire system by allowing a loop to be closed if a leak develops in a ball joint, flex-hose, or pipe, instead of closing off the entire HTF system and shutting down the plant. In order to ensure that HTF leaks do not pose a significant risk, staff proposes Condition of Certification **HAZ-4,** which would require the project owner to install a sufficient number of isolation valves that can be either manually or remotely activated.

Mitigation

Staff believes that this project's use of hazardous materials poses no significant risk but only if mitigation measures are used. These mitigation measures are discussed in this section. The potential for accidents resulting in the release of hazardous materials is greatly reduced by the implementation of a Safety Management Program, which includes both engineering and administrative controls. Elements of facility controls and the safety management plan are summarized below.

Engineering Controls

Engineering controls help to prevent accidents and releases (spills) from moving off site and affecting communities by incorporating engineering safety design criteria in the design of the project. The engineered safety features proposed by the applicant for use at the GSEP project include:

- Storage of small quantity hazardous materials in original, properly labeled containers;
- construction of secondary containment areas surrounding each of the bulk hazardous materials storage areas designed to contain accidental releases that might happen during storage or delivery plus the volume of rainfall associated with a 25-year, 24-hour storm;
- physical separation of stored chemicals in isolated containment areas in order to prevent accidental mixing of incompatible materials, which could result in the evolution and release of toxic gases or fumes;
- installation of a fire protection system for hazardous materials storage areas; and
- continuous monitoring of HTF piping system by plant staff and by automatic pressure sensors designed to trigger isolation valves if a leak is detected.

Administrative Controls

Administrative controls also help prevent accidents and releases (spills) from moving off site and affecting neighboring communities by establishing worker training programs, process safety management programs, and complying with all applicable health and safety laws, ordinances, and standards.

A worker health and safety program will be prepared by the applicant and include (but not be limited to) the following elements (see the **WORKER SAFETY AND FIRE PROTECTION** section for specific regulatory requirements):

- worker training regarding chemical hazards, health and safety issues, and hazard communication;
- procedures to ensure the proper use of personal protective equipment;
- safety operating procedures for the operation and maintenance of systems utilizing hazardous materials;
- fire safety and prevention; and
- emergency response actions including facility evacuation, hazardous material spill clean-up, and fire prevention.

At the facility, the project owner will be required to designate an individual with the responsibility and authority to ensure a safe and healthful work place. The project health and safety official will oversee the health and safety program and have the authority to halt any action or modify any work practice to protect the workers, facility, and the surrounding community in the event of a violation of the health and safety program.

Staff's proposed Condition of Certification **HAZ-1** ensures that no hazardous material would be used at the facility except as listed in Tables 5.12-1 of the AFC (GSEP 2009a), which have been reviewed by staff to determined the need and appropriateness of their use. **HAZ-1** also requires changes to the allowed list of hazardous materials and their maximum amounts to be approved by the Compliance Project Manager. Only those that are needed and appropriate would be allowed to be used. If staff feels that a safer alternative chemical can be used, staff would recommend or require its use, depending upon the impacts posed.

Additional administrative controls are required by Conditions of Certification **HAZ-2**: preparation of a Hazardous Materials Business Plan, a Process Safety Management Plan, and a Spill Prevention, Control, and Countermeasure Plan) and **HAZ-3** (development of a Safety Management Plan).

On-Site Spill Response

In order to address the issue of spill response, the facility will prepare and implement an emergency response plan that includes information on hazardous materials contingency and emergency response procedures, spill containment and prevention systems, personnel training, spill notification, on-site spill containment, and prevention equipment and capabilities, as well as other elements. Emergency procedures will be established which include evacuation, spill cleanup, hazard prevention, and emergency response.

The presence of oil in a quantity greater than 1,320 gallons might invoke a requirement to prepare a Spill Prevention Control and Countermeasures (SPCC) Plan. The quantity of oil contained in any one of the planned 230/500 kV transformers would be in excess of the minimum quantity that requires such a plan. However, there are no known waters of the State or of the United States and thus staff's position is that no SPCC Plan is required by 40 CFR 112. However, pursuant to California HSC Sections 25270 through 25270.13, the GSEP will be required to prepare a SPCC because it will store 10,000 gallons or more of petroleum on-site. The above regulations would also require the immediate reporting of a spill or release of 42 gallons or more to the California Office of Emergency Services and the Certified Unified Program Authority (CUPA).

Plant personnel would be trained as a hazardous materials response team which would be the first responder to hazardous materials incidents. In the event of a large incident involving hazardous materials, backup support would be provided by the Riverside County Fire Department which has a hazmat response unit capable of handling any incident at the proposed GSEP and would respond in about 1.5-2 hours (GSEP 2009a, Section 5.12.3.2 and RCFD 2010).

Transportation of Hazardous Materials

Various containerized and bulk hazardous materials would be transported to the facility via truck. The applicant estimated that about 15 deliveries of hazardous materials would be required per month during operations (GSEP 2009a, Section 5.11.2.3). In addition, about 2 million gallons of HTF would be transported to the site before construction is complete, requiring roughly 330 deliveries (assuming about 6,000 gallons per tanker). While many types of hazardous materials will be transported to the site, staff believes that transport of HTF poses the predominant risk associated with hazardous materials transport. It should be noted that previous modeling of spills involving much larger quantities of more toxic materials such as aqueous and anhydrous ammonia (two hazardous materials that *would not* be used, stored, or transported to the proposed GSEP) has demonstrated that significant airborne concentrations would only occur at short distances from the spill.

Staff reviewed the applicant's proposed transportation routes for hazardous materials delivery. Trucks would travel on I-10 to the project site via a new access road of short distance. (GSEP 2009a, Section 5.12.2.3). Staff finds that the hazardous materials transportation associated with this project would not significantly increase the risks associated with regional hazardous materials transportation. Furthermore, staff believes it is appropriate to rely upon the extensive regulatory program that applies to the shipment of hazardous materials on California highways to ensure safe handling in general transportation (see Federal Hazardous Materials Transportation Law 49 USC §5101 et seq, DOT regulations 49 CFR subpart H, §172–700, and California Department of Motor Vehicles (DMV) regulations on hazardous cargo). These regulations also address the issue of driver competence.

Staff therefore believes that the risk of exposure to significant concentrations of HTF during transportation to the facility is insignificant because of the remote possibility that an accidental release of a sufficient quantity could be dangerous to the public. The transportation of similar volumes of hazardous materials on the nation's highways is neither unique nor infrequent. Based on the environmental mobility, toxicity, the quantities at the site, and frequency of delivery, it is staff's opinion that HTF poses the predominate risk associated with both use and hazardous materials transportation. Staff concludes that the risk associated with the transportation of other hazardous materials to the site would not increase the risk of overall impact significantly above that associated with HTF transportation alone.

Seismic Issues

It is possible that an earthquake could cause the failure of hazardous materials storage tanks and/or solar field piping. An earthquake could also cause failure of the secondary containment system (berms and dikes), as well as the failure of electrically controlled valves and pumps. The failure of all of these preventive control measures might then result in leaks of chemicals that may cause fires or impact the environment. The applicant stated that the piping in the solar array will be constructed to be flexible and to allow movement (necessary to accommodate thermal expansion). The piping will be attached with ball joints and won't be fixed to a rigid structure; therefore reducing the likelihood of failure during an earthquake (GSEP 2009a, Section 5.12.2.3).

Information obtained after the January 1994 Northridge earthquake showed that some damage was caused both to several large storage tanks and to smaller tanks associated with the water treatment system of a cogeneration facility. The tanks with the greatest damage, including seam leakage, were older tanks, while the newer tanks sustained displacements and failures of attached lines. Staff reviewed the impacts of the February 2001 Nisqually earthquake near Olympia, Washington, a state with similar seismic design codes as California. No hazardous materials storage tanks failed as a result of that earthquake. Staff also conducted an analysis of the codes and standards which should be followed when designing and building storage tanks and containment areas to withstand a large earthquake. Staff notes that the proposed facility will be designed and constructed to the standards of the 2007 California Building Code for Seismic Risk Zone 4 (GSEP 2009a, Section 5.12.2.3). Therefore, on the basis of what occurred in Northridge with older tanks and the lack of failures during the Nisqually earthquake (with newer tanks), staff determined that tank failures during seismic events are not probable and do not represent a significant risk to the public.

Site Security

GSEP proposes to use hazardous materials in sufficient quantities that special site security measures should be developed and implemented to prevent unauthorized access. The North American Electric Reliability Corporation (NERC) published *Security Guidelines for the Electricity Sector* in 2002 (NERC 2002), and the U.S. Department of Energy published a draft *Vulnerability Assessment Methodology for Electric Power Infrastructure* in 2002 (DOE 2002). The energy generation sector is one of 14 areas of critical Infrastructure listed by the U.S. Department of Homeland Security. On April 9, 2007, the U.S Department of Homeland Security published, in the Federal Register (6 CFR Part 27), an Interim Final Rule requiring facilities that use or store certain hazardous materials to conduct vulnerability assessments and implement certain specified security measures. This rule was implemented with the publication of Appendix A, the list of chemicals, on November 2, 2007. The GSEP will not use or store any chemicals above the threshold levels and therefore the CFATS regulation will not apply and the project owner will not need to submit a “Top Screen” assessment to the DHS. However, staff believes that all power plants under the jurisdiction of the Energy Commission should implement a minimum level of security consistent with the guidelines listed here.

In order to ensure that this facility (or a shipment of hazardous material) is not the target of unauthorized access, staff’s proposed conditions of certification **HAZ-5** and **HAZ-6** address both construction security and operations security plans. These plans would require the implementation of site security measures that are consistent with both the above-referenced documents and Energy Commission guidelines.

The goal of these conditions of certification is to provide the minimum level of security for power plants needed to protect California’s electrical infrastructure from malicious mischief, vandalism, or domestic/foreign terrorist attacks. The level of security needed for this power plant is dependent upon the threat imposed, the likelihood of an adversarial attack, the likelihood of success in causing a catastrophic event, and the severity of consequences of that event.

In order to determine the level of security, the Energy Commission staff used an internal vulnerability assessment decision matrix modeled after the U.S. Department of Justice Chemical Vulnerability Assessment Methodology (July 2002), the NERC 2002 guidelines, the U.S. Department of Energy VAM-CF model, and U.S. Department of Homeland Security regulations published in the Federal Register (Interim Final Rule 6 CFR Part 27). Staff determined that the GSEP would fall into the "low vulnerability" category, so staff proposes that certain security measures be implemented but does not propose that the project owner conduct its own vulnerability assessment.

These security measures include perimeter fencing and breach detectors, possibly guards, alarms, site access procedures for employees and vendors, site personnel background checks, and law enforcement contact in the event of a security breach. Site access for vendors would be strictly controlled. Consistent with current state and federal regulations governing the transport of hazardous materials, hazardous materials vendors would have to maintain their transport vehicle fleets and employ only drivers who are properly licensed and trained. The project owner would be required, through its contractual language with vendors, to ensure that vendors supplying hazardous materials strictly adhere to the U.S. DOT requirements that hazardous materials vendors prepare and implement security plans per 49 CFR 172.800 and ensure that all hazardous materials drivers are in compliance with personnel background security checks per 49 CFR Part 1572, Subparts A and B. The compliance project manager (CPM) may authorize modifications to these measures, or may require additional measures in response to additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or NERC, after consultation with appropriate law enforcement agencies and the applicant.

Closure and Decommissioning Impacts and Mitigation

Closure of the proposed GSEP (temporary or permanent) would follow a facility closure plan prepared by the applicant and designed to minimize public health and environmental impacts. Decommissioning procedures would be consistent with all applicable LORS and would include monitoring of hazardous materials storage vessels, safe cessation of processes which use hazardous materials, disposal of hazardous materials and hazardous wastes, and documentation of practices and inventory (GSEP 2009a, Section 5.12.2.4). Staff expects that impacts from the closure and decommissioning process would represent a fraction of the impacts associated with the construction or operation of the proposed GSEP. Therefore based on staff's analysis for the construction and operation phases of this project, staff concludes that hazardous materials-related impacts from closure and decommissioning of the GSEP would be insignificant.

C.4.4.3 CEQA LEVEL OF SIGNIFICANCE

Staff's analysis of impacts associated with the storage, use, and handling of hazardous materials at the proposed GSEP has determined that impacts would be below the level of significance if staff's proposed Conditions of Certification are adopted.

C.4.5 REDUCED ACREAGE ALTERNATIVE

The Reduced Acreage Alternative would essentially be Unit 1 of the proposed project, including a 125 MW solar facility located within the boundaries of the proposed project as defined by NextEra. This alternative is analyzed for two major reasons: (1) it eliminates about 50 percent of the proposed project area so impacts are reduced, and (2) by eliminating the eastern solar field, which is located on flowing desert washes, it would reduce impacts to the sand dune and playa areas and to the Mojave Fringe-toed Lizard habitat. The alternative would also reduce impacts to wildlife movement by reducing obstruction of the Palen wash and would maintain, thru both fluvial and Aeolian processes, the dune and sandy habitats. The boundaries of the Reduced Acreage Alternative are shown in **Alternatives Figure 1**.

C.4.5.1 SETTING AND EXISTING CONDITIONS

This alternative is located entirely within the boundaries of the proposed project. It simply eliminates effects to the eastern 125 MW solar field and relocates the gas yard approximately 1.75 miles northwest of its present location. As a result, the environmental setting consists of the western portion of the proposed project, as well as the area affected by the linear project components.

C.4.5.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Potential impacts associated with hazardous materials use during construction and operation of the Reduced Acreage Alternative would likely be reduced compared to those estimated for the GSEP as proposed due to the smaller quantities of hazardous materials required. However, staff's analysis has determined that no significant impacts are expected from the storage and use of hazardous materials at the GSEP as proposed. Therefore staff concludes that with respect to hazardous materials handling, the Reduced Acreage Alternative is not preferable over the project as proposed.

C.4.5.3 CEQA LEVEL OF SIGNIFICANCE

The CEQA level of significance for hazardous materials management would not change with the Reduced Acreage Alternative, as both the project as proposed and the Reduced Acreage Alternative would have impacts below the level of significance. The same conditions of certification would be required for the Reduced Acreage Alternative and the project as proposed.

C.4.6 DRY COOLING ALTERNATIVE

This section identifies the potential impacts of using air-cooled condenser (ACC) systems rather than the cooling towers proposed by NextEra for the Genesis project. It is assumed that the ACC systems would be located where the cooling towers are currently proposed for each of the two 125 MW power block, as illustrated in **Alternatives Figure 2** (see Section B.3).

Approximately 18 ACC fans would be required for each of the two solar fields. The 18 fans, or ACC's, would operate when the ambient temperature is above 50 degrees Fahrenheit. When the temperature is below 50 degrees Fahrenheit, only 10 of the fans

would be used (GSEP 2009f). The 18 ACC fans described in the GSEP cooling study would have a length of approximately 279 feet, a width of approximately 127 feet, and a height of 98 feet (GSEP 2009f). However, based on the ACC preliminary designs for nearby solar thermal projects in similar ambient temperatures, an additional 11,690 square feet could be required for siting of the fans and the fans would be up to 120 feet in height. In addition to the ACC fans, NextEra would use a small Wet Surface Air Cooler when needed to provide auxiliary cooling during extremely hot days (GSEP 2009f). This alternative is analyzed because it would reduce the amount of water required for steam turbine cooling from 822 acre-feet per year (AFY) to 66 AFY. This reduction in water use would reduce impacts to water and biological resources and require the same but a lesser amount of cooling water treatment chemicals.

C.4.6.1 Setting and Existing Conditions

This alternative is located entirely within the boundaries of the proposed project. It simply eliminates the use of wet-cooling towers and incorporated the use of air-cooled condensers (ACC) in the same location. As a result, the environmental setting would be the same as for the proposed project.

C.4.6.2 Assessment of Impacts and Discussion of Mitigation

The majority of the hazardous materials use with the Dry Cooling Alternative, including the quantities handled during transportation and disposal, would be the same as those of the proposed project. However, some hazardous materials would be eliminated because they are required specifically for the wet-cooling system, such as sodium hypochlorite used in the cooling tower biological control to control algae growth. Additionally, because the use of water would be reduced from 822 AFY to approximately 66 AFY per 125 MW power block, the use of water treatment chemicals described in Table 5.12-1 of the AFC would also be reduced. As such, hazardous materials usage is expected to decrease with the use of the Dry Cooling Alternative.

C.4.6.3 CEQA Level of Significance

No new impacts related to hazardous materials would be created with use of ACCs in place of cooling towers, and some project impacts would be reduced. The overall impacts of the project with dry cooling would be similar to those of the proposed project since both would have less than significant impacts resulting form the use of hazardous materials.

C.4.7 NO PROJECT/NO ACTION ALTERNATIVE

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

C.4.7.1 NO ACTION ON PROPOSED PROJECT APPLICATION AND ON CDCA LAND USE PLAN AMENDMENT

Under this alternative, the proposed Genesis Solar Energy Project would not be approved by the CEC and BLM and 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. As a result, no hazardous materials would be used and no impacts related to the use of hazardous material 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.

C.4.7.2 NO ACTION ON PROPOSED PROJECT APPLICATION AND AMEND THE CDCA LAN USE PLAN TO MAKE THE AREA AVAILABLE FOR FUTURE SOLAR DEVELOPMENT

Under this alternative, the proposed Genesis Solar Energy Project would not be approved by the CEC 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, construction and operation of the solar technology would likely result in use of hazardous materials. Different solar technologies require the use of different hazardous materials; however, it is expected that all solar technologies would require the use of hazardous materials. As such, this No Project/No Action Alternative could result impacts to hazardous material handling similar to under the proposed project.

C.4.7.3 NO ACTION ON PROPOSED PROJECT APPLICATION AND AMEND THE CDCA LAND USE PLAN TO MAKE THE AREA UNAVAILABLE FOR FUTURE SOLAR DEVELOPMENT

Under this alternative, the proposed Genesis Solar Energy Project would not be approved by the CEC 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 use of hazardous materials. As a result, this No Project/No Action Alternative would not result in impacts from the use of hazardous materials. 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.4.8 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 Figure 1** 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.
- Foreseeable future projects in the immediate area as shown on **Cumulative Impacts Figure 2, I-10 Corridor 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 I-10 Corridor Area. Both tables indicate project name and project type, its location and its status.

These projects are defined within a geographic area that has been identified by the CEC 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 SA/DPA/DEIS.

C.4.8.1 GEOGRAPHIC SCOPE OF ANALYSIS

The geographic area considered for cumulative impacts on Hazardous Materials Management is only within the project boundaries.

C.4.8.2 EFFECTS OF PAST AND PRESENT PROJECTS

For this analysis, there are no projects or developments in the area or region that use, store, and/or transport hazardous materials that staff has found to have an impact on the region. The use of hazardous materials is neither frequent nor concentrated in this area. Two power plants that store, use, and transport hazardous materials in the area, the Blythe Power Plants I and II, are not considered by staff to have an impact on the area.

Staff analyzed the potential for hazardous materials cumulative impacts at many other power plant projects. A significant cumulative hazardous materials impact is defined as the simultaneous uncontrolled release of hazardous materials from multiple locations in a form (gas or liquid) that could cause a significant impact where the release of one hazardous material alone would not cause a significant impact. Existing locations that use or store gaseous or liquid hazardous materials, or locations where such facilities might likely be built, were both considered. Staff believes that while cumulative impacts are theoretically possible, they are not probable because of the many safeguards implemented to both prevent and control an uncontrolled release. The chances of one uncontrolled release occurring are remote. The chance of two or more occurring simultaneously, with resulting airborne plumes

mingling to create a significant impact, are even more remote. Staff believes the risk to the public is insignificant.

The applicant will develop and implement a hazardous materials handling program for the GSEP independent of any other projects considered for potential cumulative impacts. Staff believes that the facility, as proposed by the applicant and with the additional mitigation measures proposed by staff, poses a minimal risk of accidental release that could result in off-site impacts. It is unlikely that an accidental release that has very low probability of occurrence (about one in one million per year) would independently occur at this site and another facility at the same time. Therefore, staff concludes that the facility would not contribute to a significant hazardous materials-related cumulative impact.

C.4.8.3 EFFECTS OF REASONABLY FORESEEABLE FUTURE PROJECTS

Hazardous Materials Management at the proposed project are also not expected to be affected by any reasonably foreseeable future projects, including the proposed Blythe and Palen solar projects proposed for the I-10 corridor. The reasons for staff's position are described above.

Contribution of the Genesis Solar Energy Project to Cumulative Impacts

Construction. The construction of GSEP is not expected to result in short term adverse impacts related to hazardous materials use. It is expected that some of the cumulative projects described above which are not yet built may be under construction the same time as the GSEP, however, short term impacts related to Hazardous Materials Management during construction of those cumulative projects are not expected to occur.

Operation. The operation of the GSEP is not expected to result in long term adverse impacts related to Hazardous Materials Management even though it is expected that some of the cumulative projects described above may be operational at the same time as the GSEP.

Decommissioning. The decommissioning of the GSEP is not expected to result in adverse impacts related to Hazardous Materials Management. It is unlikely that the construction or decommissioning of any of the cumulative projects would occur concurrently with the decommissioning of this project, because the decommissioning is not expected to occur for approximately 40 years. As a result, it is not expected that significant impacts related to Hazardous Materials Management during decommissioning of the GSEP generated by the cumulative projects will occur.

C.4.8.4 OVERALL CONCLUSION

The potential for off-site impacts resulting from hazardous materials use at the GSEP is insignificant due to the nature of the materials used and the engineering and administrative controls that would be implemented to prevent and control accidental releases of hazardous materials. Because of this determination, and the additional fact that there are no existing or future foreseeable facilities in the immediate proximity (less than 1 mile) using large amounts of hazardous chemicals, there is little (if any)

possibility that vapor plumes would mingle (combine) to produce an airborne concentration that would present a significant risk should an accidental release occur.

C.4.9 COMPLIANCE WITH LORS

Staff concludes that construction and operation of the GSEP project would be in compliance with all applicable laws, ordinances, regulations, and standards (LORS) regarding long-term and short-term project impacts in the area of hazardous materials management.

C.4.10 NOTEWORTHY PUBLIC BENEFITS

The construction and operation of a solar power plant such as the proposed GSEP requires in general smaller quantities of hazardous materials and materials that are less dangerous to the public than a natural-gas fired power plant. Building solar power plants to supply the required energy in California therefore benefits the public by reducing the risks otherwise associated with the use and transport of large quantities of more hazardous materials such as aqueous or anhydrous ammonia.

C.4.10 PROPOSED CONDITIONS OF CERTIFICATION/MITIGATION MEASURES

HAZ-1 The project owner shall not use any hazardous materials not listed in Appendix A, below, or in greater quantities or strengths than those identified by chemical name in Appendix A, below, unless approved in advance by the Compliance Project Manager (CPM).

Verification: The project owner shall provide to the CPM, in the Annual Compliance Report, a list of hazardous materials contained at the facility.

HAZ-2 The project owner shall concurrently provide a Hazardous Materials Business Plan (HMBP), a Spill Prevention, Control, and Countermeasure Plan (SPCC), and a Process Safety Management Plan (PSMP) to the Riverside County Environmental Health Department (RCEHD) and the CPM for review. After receiving comments from the RCEHD and the CPM, the project owner shall reflect all recommendations in the final documents. Copies of the final HMBP shall then be provided to the RCEHD for information and to the CPM for approval.

Verification: At least 60 days prior to receiving any hazardous material on the site for commissioning or operations, the project owner shall provide a copy of a final Hazardous Materials Business Plan, a Spill Prevention, Control, and Countermeasure Plan, and a Process Safety Management Plan to the CPM for approval.

HAZ-3 The project owner shall develop and implement a Safety Management Plan for the delivery and handling of liquid and gaseous hazardous materials. The plan shall include procedures, protective equipment requirements, training and a checklist. It shall also include a section describing all measures to be implemented to prevent mixing of incompatible hazardous materials. This

plan shall be applicable during construction, commissioning, and operation of the power plant.

Verification: At least sixty (60) days prior to the delivery of any liquid or gaseous hazardous material to the facility, the project owner shall provide a Safety Management Plan as described above to the CPM for review and approval.

HAZ-4 The project owner shall place an adequate number of isolation valves in the Heat transfer Fluid (HTF) pipe loops so as to be able to isolate a solar panel loop in the event of a leak of fluid. These valves shall be actuated manually and remotely. The engineering design drawings showing the number, location, and type of isolation valves shall be provided to the CPM for review and approval prior to the commencement of the solar array construction.

Verification: At least sixty (60) days prior to the commencement of solar array construction, the project owner shall provide the design drawings as described above to the CPM for review and approval.

HAZ-5 Prior to commencing construction, a site-specific Construction Site Security Plan for the construction phase shall be prepared and made available to the CPM for review and approval. The Construction Security Plan shall include the following:

1. perimeter security consisting of fencing enclosing the construction area;
2. security guards;
3. site access control consisting of a check-in procedure or tag system for construction personnel and visitors;
4. written standard procedures for employees, contractors and vendors when encountering suspicious objects or packages on site or off site;
5. protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency; and
6. evacuation procedures.

Verification: At least thirty (30) days prior to commencing construction, the project owner shall notify the CPM that a site-specific Construction Security Plan is available for review and approval.

HAZ-6 The project owner shall also prepare a site-specific security plan for the commissioning and operational phases that will be available to the CPM for review and approval. The project owner shall implement site security measures that address physical site security and hazardous materials storage. The level of security to be implemented shall not be less than that described below (as per NERC 2002).

The Operation Security Plan shall include the following:

1. permanent full perimeter fence or wall, at least eight feet high and topped with barbed wire or the equivalent;

2. main entrance security gate, either hand operated or motorized;

3. evacuation procedures;

4. protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency;

5. written standard procedures for employees, contractors, and vendors when encountering suspicious objects or packages on site or off site;

   A. a statement (refer to sample, **ATTACHMENT A**), signed by the project owner certifying that background investigations have been conducted on all project personnel. Background investigations shall be restricted to determine the accuracy of employee identity and employment history and shall be conducted in accordance with state and federal laws regarding security and privacy;

   B. a statement(s) (refer to sample, **ATTACHMENT B**), signed by the contractor or authorized representative(s) for any permanent contractors or other technical contractors (as determined by the CPM after consultation with the project owner), that are present at any time on the site to repair, maintain, investigate, or conduct any other technical duties involving critical components (as determined by the CPM after consultation with the project owner) certifying that background investigations have been conducted on contractors who visit the project site;

6. site access controls for employees, contractors, vendors, and visitors;

7. a statement(s) (refer to sample, **ATTACHMENT C**), signed by the owners or authorized representative of hazardous materials transport vendors, certifying that they have prepared and implemented security plans in compliance with 49 CFR 172.802, and that they have conducted employee background investigations in accordance with 49 CFR Part 1572, subparts A and B;

8. closed circuit TV (CCTV) monitoring system, recordable, and viewable in the power plant control room and security station (if separate from the control room) with cameras able to pan, tilt, and zoom, have low-light capability, and are able to view the outside entrance to the control room and the front gate; and

9. additional measures to ensure adequate perimeter security consisting of either:

   A. security guard(s) present 24 hours per day, 7 days per week; **or**

   B. power plant personnel on site 24 hours per day, 7 days per week,

   and

the CCTV able to view 100% of the entire solar array fenceline perimeter

or breach detectors **or** on-site motion detectors along the entire solar array fenceline.

The project owner shall fully implement the security plans and obtain CPM approval of any substantive modifications to those security plans. The CPM may authorize modifications to these measures, or may require additional measures such as protective barriers for critical power plant components—transformers, gas lines, and compressors—depending upon circumstances unique to the facility or in response to industry-related standards, security concerns, or additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or the North American Electrical Reliability Council, after consultation with both appropriate law enforcement agencies and the applicant.

Verification: At least thirty (30) days prior to the initial receipt of hazardous materials on site, the project owner shall notify the CPM that a site-specific operations site security plan is available for review and approval. In the annual compliance report, the project owner shall include a statement that all current project employee and appropriate contractor background investigations have been performed, and that updated certification statements have been appended to the operations security plan. In the annual compliance report, the project owner shall include a statement that the operations security plan includes all current hazardous materials transport vendor certifications for security plans and employee background investigations.

C.4.12 CONCLUSIONS

Staff's evaluation of the proposed project (with proposed mitigation measures) indicates that hazardous material use, storage, and transportation would not pose a significant impact on the public. Staff's analysis also shows that there would be no significant cumulative impact. With adoption of the proposed conditions of certification, the proposed project would comply with all applicable LORS. Other proposed conditions of certification address the issues of site security matters.

Staff recommends that the Energy Commission impose the proposed conditions of certification to ensure that the project is designed, constructed, and operated in compliance with applicable LORS, and would protect the public from significant risk of exposure to an accidental release of hazardous materials. If all mitigation proposed by the applicant and by staff are implemented, the use, storage, and transportation of hazardous materials would not present a significant risk to the public.

Staff concludes that there is insignificant potential for hazardous materials release to have an impact beyond the facility boundary, and therefore concludes there is also insignificant potential for significant impacts to the environment. For any other potential impacts upon the environment, including vegetation, wildlife, air, soils, and water resulting from hazardous materials usage and disposal at the proposed facility, the

reader is referred to the **Biology**, the **Air Quality**, the **Soil and Water**, and the **Waste Management** sections of this SA.

Staff proposes six conditions of certification which are mentioned in the text above. **HAZ-1** ensures that no hazardous material would be used at the facility except as listed in **Appendix A** of this section, unless there is prior approval by the Energy Commission Compliance Project Manager. **HAZ-2** ensures that local emergency response services are notified of the amounts and locations of hazardous materials at the facility, **HAZ-3** requires the development of a Safety Management Plan that addresses the delivery of all liquid hazardous materials during the construction, commissioning, and operation of the project would further reduce the risk of any accidental release not specifically addressed by the proposed spill prevention mitigation measures, and further prevent the mixing of incompatible materials that could result in the generation of toxic vapors. **HAZ-4** addresses the use of HTF in the solar array. Site security during both the construction and operation phases is addressed in **HAZ-5** and **HAZ-6.**

SAMPLE CERTIFICATION (Attachment A)

Affidavit of Compliance for Project Owners

I,

_____

(Name of person signing affidavit)(Title)

do hereby certify that background investigations to ascertain the accuracy of the identity and employment history of all employees of

_____

(Company name)

for employment at

_____

(Project name and location)

have been conducted as required by the California Energy Commission Decision for the above-named project.

_____

(Signature of officer or agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

SAMPLE CERTIFICATION (Attachment B)

Affidavit of Compliance for Contractors

I,

_____

(Name of person signing affidavit)(Title)

do hereby certify that background investigations to ascertain the accuracy of the identity and employment history of all employees of

_____

(Company name)

for contract work at

_____

(Project name and location)

have been conducted as required by the California Energy Commission Decision for the above-named project.

_____

(Signature of officer or agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

SAMPLE CERTIFICATION (Attachment C)

Affidavit of Compliance for Hazardous Materials Transport Vendors

I,

_____

(Name of person signing affidavit)(Title)

do hereby certify that the below-named company has prepared and implemented security plans in conformity with 49 CFR 172.880 and has conducted employee background investigations in conformity with 49 CFR 172, subparts A and B,

_____

(Company name)

for hazardous materials delivery to

_____

(Project name and location)

as required by the California Energy Commission Decision for the above-named project.

_____

(Signature of officer or agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

C.4.13 REFERENCES

GSEP 2009a – Genesis Solar Energy Project/T. Bernhardt (tn:53083) Application for Certification for the Genesis Solar Energy Project. 08/31/2009

GSEP 2009f – Genesis Solar Energy Project/T. Bernhardt (tn:54453) Data Responses Set 1A (# 1-227) for the Genesis Solar Energy Project. 12/15/2009

North American Electric Reliability Council (NERC) 2002. Security Guidelines for the Electricity Sector, Version 1.0, June 14, 2002.

Riverside County Fire Department – (tn: 54769) Letter from Captain Jason Newman, Strategic Planning Division. 1/07/10

U.S. Department of Energy (US DOE). 2002. Draft Vulnerability Assessment Methodology, Electric Power Infrastructure. Office of Energy Assurance, September 30, 2002.

HAZARDOUS MATERIALS
APPENDIX A

Hazardous Materials Proposed for Use at the GSEP

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Hazardous Materials Appendix A
Hazardous Materials Proposed for Use at the GSEP

Material	CAS No.	Application	Hazardous Characteristics	Maximum Quantity On Site	CERCLA SARA RQ[a]
Acetylene	74-86-2	Welding gas	Health: moderate toxicity Physical: toxic	600 cubic feet	
Argon	7440-37-1	Welding gas	Health: low toxicity Physical: non-flammable gas	600 cubic feet	
Carbon Dioxide			Health: low toxicity Physical: non-flammable gas	15 tons	
Diesel Fuel		Equipment refueling and emergency diesel fire pump	Health: low toxicity Physical: combustible liquid	3,600 gallons	
Fertilizer Monopotassium Phosphate		Treatment of HTF contaminated soil	Health: low toxicity Physical: irritant	250 pounds	
Fertilizer Urea		Treatment of HTF contaminated soil	Health: low toxicity Physical: N/A	250 pounds	
Hydraulic Fluid		High-pressure combustion turbine starting system, turbine control valve actuators	Health: low to moderate toxicity Physical: Class IIIB combustible liquid	500 gallons in equipment, maintenance inventory of 110 gallons in 55-gallon steel drums	
Hydrogen		Steam turbine generator cooling	Health: low toxicity Physical: flammable gas	20,000 SCF	
Lube Oil		Lubricate rotating equipment (e.g., gas turbine and steam-turbine bearings)	Health: low toxicity Physical: N/A	10,000 gallons in equipment and piping, additional maintenance inventory of up to 550 gallons in 55-gallon steel drums	
Mineral Insulating Oil		Transformers/switchyard	Health: low toxicity Physical: N/A	32,000	
Natural Gas (Methane)	74-82-8	Auxiliary boiler operation	Health: low toxicity Physical: flammable gas	No on-site storage, up to 140 pounds of natural gas in equipment and piping	
Nitrogen	7727-37-9		Health: low toxicity Physical: flammable gas	7,500 pounds	
Material	**CAS No.**	**Application**	**Hazardous Characteristics**	**Maximum Quantity On Site**	**CERCLA SARA RQ[a]**
Oxygen	7782-44-7	Welding gas	Health: low toxicity	600 cubic feet	

			Physical: oxidizer		
Sodium Hypochlorite (12.5%)		Cooling tower biological control	Health: high toxicity Physical: Poison-B, corrosive	8,500 gallons	100 pounds
Sulfur Hexaflouride		230-kV breaker insulating medium	Health: none Physical: none		
Sulfuric Acid (29.5%) solution			Health: high toxicity Physical: corrosive and water reactive	2,000 gallons	1,000 pounds
Sulfuric Acid (93%) solution			Health: high toxicity Physical: corrosive and water reactive	8,500 gallons	1,000 pounds
Therminol VP-1 Diphenyl Ether (73.5%) Biphenyl (26.5%)		Heat transfer fluid in the solar array	Health: moderate toxicity Physical: irritant; combustible liquid (Class III-B)	2.0 MM gallons	100 pounds
Water Treatment Chemical NALCO Tri-Act 1800 Cyclohexlyamine (5 – 10%) Monoehtanolamine (10 – 30%) Methoxyproplyamine (10 – 30%)			Health: high toxicity Physical: corrosive, class II combustible liquid	800 gallons	
Water Treatment Chemical NALCO Elimin-Ox Carbohydazide (5 – 10%)			Health: moderate toxicity Physical: corrosive	800 gallons	
Water Treatment Chemical NALCO 3D Trasar 3DT185 Phosphoric Acid (60 – 100%)			Health: high toxicity Physical: corrosive	800 gallons	
Water Treatment Chemical NALCO 3D Trasar 3DT177 Phosphoric Acid (30%)			Health: moderate toxicity Physical: irritant	800 gallons	
Material	**CAS No.**	**Application**	**Hazardous Characteristics**	**Maximum Quantity On Site**	**CERCLA SARA RQ[a]**
Water Treatment Chemical NALCO 3D Trasar 3DT190			Health: low toxicity Physical: irritant	800 gallons	
Water Treatment Chemical NALCO Acti-Brom ® 7342 Sodium Bromide			Health: low toxicity Physical: irritant	800 gallons	

Water Treatment Chemical NALCO pHreedom ® 5200M Sodium salt of phosphonomethylated diamine			Health: low to moderate toxicity Physical: irritant	800 gallons	
Water Treatment Chemical NALCO PCL-1346			Health: low toxicity Physical: irritant	800 gallons	
Water Treatment Chemical NALCO Permacare ® PC-7408 Sodium Bisulfite			Health: low toxicity Physical: irritant	800 gallons	
Water Treatment Chemical NALCO BT-3000 Sodium Hydroxide Sodium Tripolyphosphate			Health: high toxicity Physical: corrosive	800 gallons	
Water Treatment Chemical NALCO 8338 Sodium Nitrate Sodium Tolytriazole Sodium Hydroxide			Health: moderate toxicity Physical: toxic	800 gallons	

Source: GSEP 2009a Table 5.12-1
a. Reportable quantities for a pure chemical, per the Comprehensive Environmental Response, Compensation, and Liability Act.