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This document, Cultural Resources Appendix CR-1, contains data that supports the Cultural Resources analysis contained in Chapter 4.4 of the Preliminary Staff Assessment (PSA) for the proposed Alamitos Energy Center. This appendix was inadvertently omitted from the PSA when docketed on July 13, 2016.

Sincerely,

Date: July 19, 2016

Signature on file
KEITH WINSTEAD
Planner III
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CULTURAL RESOURCES APPENDIX CR-1

BACKGROUND INFORMATION NOT INCLUDED IN THE PSA

The information contained in this appendix is included to support the cultural resources topics that staff treated in summary fashion in the **CULTURAL RESOURCES** section of the preliminary staff assessment (PSA).

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 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 project vicinity. 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.

Paleoclimate and Ecology

The paleoclimate and ecology of the project vicinity is best documented by the Landing Hill and California State University, Long Beach (CSULB) archaeological investigations (both contexts range in elevation from about 8–70 feet above mean sea level), as well as a recent reconstruction of late nineteenth-century coastal geomorphology. The Landing Hill archaeological project assembled a 20,000-year paleoenvironmental record derived from pollen, phytolith[1], and diatom[2] analyses from a 19-foot-deep sediment core; pollen and phytolith analyses from archaeological soils; pollen, phytolith, starch, and protein analyses of artifacts and soil samples; and an archaeoclimatic (precipitation) model (Cleland et al. 2007:291). The CSULB archaeological investigations garnered a paleoenvironmental record from the last 1,100 years, whereas the coastal geomorphological reconstruction relied on historical records from the last 150 years (Boxt et al. 1999:25; Engstrom 2006). These paleoclimatic studies yield an understanding of the project vicinity's changing landscape and ecology during the span of human habitation of the southern coastline. An accurate picture of paleoclimate and ecology provides explanations for and expectations of the range of cultural resources in the project vicinity.

At the transition from the Pleistocene Epoch's[3] Last Glacial Maximum (LGM) to the Holocene Epoch[4], mean sea level was significantly lower than present levels. San

[1] Inorganic crystalline structures in plants (Holloway 1997:189).

[2] Unicellular, usually microscopic, algae (Rhodes et al. 1962:150).

[3] The interval of time (epoch) spanning 2.588 million years ago–11,700 B.P. (Cohen et al. 2013). The term "B.P." (Before Present) is an international dating convention that refers to the year 1950 as the present.

[4] The Holocene Epoch is the interval from 11,700 B.P. to the present day (Cohen et al. 2013). Geoscientists divide the Holocene Epoch into three broad divisions: Early (11,500–7550 B.P.), Middle

Pedro Bay did not exist, as the coastline extended some 10–13 miles south and west of the modern shoreline (Masters and Aiello 2007:Figure 3.1); the area in the vicinity of the project, therefore, was between 12 and 15 miles from the ocean about the time that humans began to settle the southern California coast, rather than the current 2-mile distance. The Channel Islands were larger and closer to the mainland during the LGM–Holocene transition as well: at 12,000 B.P., Santa Catalina Island was approximately 15 miles off the coast of what is now Long Beach; two thousand years later, rising sea level increased that distance to 18 miles. Presently, the island is about 32 miles west of the project area of analysis (PAA). (Porcasi et al. 1999: Figure 1.)

Cleland et al. (2007:291–292) describe an archaeoclimatic model of a Los Angeles Basin that witnessed increased average annual air temperatures beginning approximately 14,000 B.P., the overall trend running from 63.5 to 66.2 degrees Fahrenheit (° F). The temperature does not appear to have changed gradually and consistently, but in rapid rises and drops over time between long periods of stable temperature. For instance, between about 14,000 and 10,000 B.P., average annual air temperature seems to have increased rapidly from 63.5 to 64.4 ° F, dropped to 63.5 ° F, and then warmed again to 65.3 ° F. Temperature remained stable between 10,000 and 8000 B.P., then increased to 66.2 ° F (see also Altschul et al. 2007:35). San Pedro-coastal temperature entered another period of stability thought to have lasted from 8000 to 2000 B.P. Mean annual air temperatures dropped to 65.3 ° F during two volcanic events at 3800 and 1900 B.P. (Cleland et al. 2007:292).

Although the wet winter/dry summer climate of southern California is thought to have persisted for as many as 160,000 years (Masters and Aiello 2007:40), this unimodal rain pattern held for only the last 1,800 years in the project vicinity (Cleland et al. 2007:292). Late Pleistocene/Early Holocene (ca. 14,000–7550 B.P.) annual precipitation appears to have been similar to twenty-first century conditions. The interval of 8000–6000 B.P. hosted a radical increase in precipitation (Altschul et al. 2007:35), mainly occurring in February (Cleland et al. 2007:292). After 6000 B.P., annual precipitation appears to have declined until the Vandal [volcanic] Event of 1900 B.P., at which time the quantity of precipitation increased greatly, the annual timing of rainfall shifted, and mean annual temperature decreased. After the Vandal Event, precipitation declined, the timing of annual rainfall shifted back to pre-Vandal conditions, and mean air temperature increased. (Cleland et al. 2007:292.)

The project vicinity appears to have experienced bimodal precipitation patterns, with precipitation occurring during summer and winter months, at the following intervals.

- 5800–5200 B.P.
- 4400–4000 B.P.
- 3600–3400 B.P. (weak trend)
- 3000–2200 B.P. (weak trend)
- 2200–2000 B.P.

(7000–4000 B.P.), and Late (4000 B.P.–present) (see Meyer et al. 2009:ii; West et al. 2007:20–21). This PSA follows Meyer et al. (2009).

Changes in precipitation patterns are expected to have affected the distribution of plants and animals in the project vicinity. During bimodal distribution intervals, for instance, shellfish procurement declined at Landing Hill but continued at Seal Beach archaeological sites. After 2000 B.P., unimodal precipitation resumed, and so did Landing Hill shellfish procurement. From the Early Holocene into the Middle Holocene, the Landing Hill vicinity alternated between marsh and shrub land, and occasionally developed into submerged, intermittent marsh. (Cleland et al. 2007:292–293.)

Cleland et al. (2007) identifies three pollen zones at Landing Hill. Zone 1 represents environmental conditions from about 20,000 B.P. to approximately 7690 B.P. Pollen profiles of this time period (Terminal Pleistocene and Early Holocene) exhibit a large amount of *Pinus* (pine) pollen. Also present are fir, spruce, birch, hickory, walnut, ash, juniper, oak, willow, and elm; *Pinus*, fir, and spruce pollen is thought to have been deposited by wind. The Landing Hill understory consisted of sagebrush, ragweed, sumpweed, dandelions, mustard-family plants, hackberry, chenopods and amaranthus, grasses, rose-family plants, and globemallow. Overall, the overstory and understory plants revealed in the pollen profiles suggest the presence of forested drainages in the area. Regional-scale forest fires likely occurred, inferred from the presence of charcoal. The Landing Hill environment through the Early Holocene may be fairly described as parkland with regular fires and intermittent flooding. (Cleland 2007:297–298, 305.)

Pollen Zone 2 covers the Early–Middle Holocene transition, being identified after a break in the pollen record around 7690 B.P. Pollen Zone 2 exhibits a diminished amount of tree pollen, but a great increase in Poacaea (bunchgrasses) and moderate amounts of *Artemisia* and highspine Asteraceae pollen. *Quercus* spp. (oaks) could have established themselves while other trees retreated. Archaeologists interpret these phenomena as the development of shrub land in face of warmer temperatures. Landing Hill at this time probably contained grassland in intermittent marsh, shrub land in the uplands. (Cleland et al. 2007:298.) This period was one of rapid deposition, the sediments anchored by grass roots. Cool season grasses dominate grasslands that were intermittently flooded. At this time, Landing Hill witnessed alternating unimodal and bimodal precipitation regimes. (Cleland et al. 2007:305.)

In Pollen Zone 3, shrub land and highspine Asteraceae dominate the pollen sample. The sunflower family was abundant, and the frequency of tree pollen was slightly greater than in Zone 2, and more varied in types. *Artemisia* became rare after approximately 6355 B.P. Ragweed/sumpweed and sunflower family were more common. (Cleland et al. 2007:298.) Bunchgrasses occurred in small amounts at 3 feet below ground surface, suggesting a late increase in grasses. Chamise was present by about 6355 B.P. Increased amounts of charcoal correspond with a 6355-B.P. radiocarbon date at Landing Hill. (Cleland et al. 2007:299.)

By approximately 7000 B.P., sagebrush-scrub vegetation replaced grassland communities. About 6 feet of sediment was deposited in Landing Hill's lowlands over a period of 1,335 years (7000–6355 B.P.), representing no fewer than five possible flood events. Large quantities of ragweed or ambrosia were present during the Zone 3 interval. Declining sagebrush led to the resurgence of earlier plant regimes. Occasional

to regular grass and shrub fires occurred, as well as intermittent flooding. The pollen record indicates that relatively stable scrub vegetation was present, which is inconsistent with the notion of a well developed marsh. Diatoms show that what marsh existed had no contact with the ocean, but had water fresh enough for human consumption. (Cleland et al. 2007:305–306.)

By the end of the Middle Holocene (5000–4500 B.P.), sea level reached approximately present-day level, changing the character of near-ocean habitats going into the Late Holocene. Sea level rise increased tidal influence and direct reach into near-shore wetlands. (Altschul et al. 2005:286.)

Late Holocene environmental trends in the project vicinity are described by Boxt et al.'s (1999) CSULB archaeological study. Boxt and colleagues note that greater than 100 years of urban development in Long Beach has, "typically entombed the margins of Alamitos Bay beneath meters of construction fill, preserving a record of past cultural and environmental events." Boxt's team obtained 102 radiocarbon dates from CA-LAN-2616 and Bouton Creek, a relict stream on the CSULB campus that once flowed from west to east along the north side of Alamitos Mesa, yielding age estimates spanning 4000–100 B.P. (Boxt et al. 1999:25.) A large flood of slack-water deposits buried Bouton Creek and four prehistoric archaeological sites (including CA-LAN-2616) on the CSULB campus during the 1860s; the flood is likely associated with the San Gabriel River's movement from the west to its current channel. (Boxt et al. 1999:28–29.)

Boxt et al. (1999:28–29) identifies six stratigraphic units at Bouton Creek:

- Construction Fill
- Overbank Alluvium
- Flood Deposit (82–83 B.P.)
- Midden (500–550 B.P.)
- Overbank Alluvium with Sparse Midden (650 B.P.)
- Paleosol5 (1050–1300 B.P.)

Additionally, Boxt and colleagues identified four pollen units based on 71 pollen samples taken at 2-inch intervals at archaeological site CA-LAN-2616:

1. *Ambrosia*[6] Zone: This pollen zone extends from 11.6 to 10.5 feet below ground surface and is radiocarbon dated to 1450–1050 B.P. 10–15 percent *Ambrosia* and 20–40 percent Liguliflorae[7] pollen. The high percentage of aquatic plants indicates low-energy swamp conditions: *Alnus* (alder), *Thypa latifolia* (common cattail/soft flag), and fern spores[8]. (Boxt et al. 1999:29.)

[5] A term used in geology and geoarchaeology to refer to a former soil or stable surface preserved by burial underneath either natural or cultural deposits (Vogel 2002:29).

[6] *Ambrosia* spp. can include burro bush and beach ragweed or beach-bur, most likely the latter (Schoenherr 1992:435, 438, 693).

[7] Liguliflorae is a subfamily within the sunflower plant family.

[8] Generic and specific plant names were obtained from Heizer and Elsasser (1980:241, 252).

2. *Artemisia*[9] Zone: This pollen zone extends from 10.5 to 9.2 feet below ground surface and dates to the interval 1050–650 B.P. The sagebrush zone contains relatively low pollen concentrations, but an unusually high percentage (40–60 percent) of sagebrush pollen and high degrees of pollen deterioration. The pollen profile of this zone is consistent with sedimentary deposition on a levee of Bouton Creek during paleosol formation and is suggestive of a relatively arid local environment. Fluctuating salinity is indicated by the presence of marine ostracods[10] and non-economic mollusks (*Heterodonax bimaculata* (false beanclam), *Sanguinolaria nuttallii* (purple clam), *Tagelus californicus* (jackknife clam), and *Ostrea lurida* (native oyster)[11]. (Boxt et al. 1999:29.)

3. Liguliflorae Zone: This pollen zone extends from 9.2 to 2.8 feet below ground surface and dates to the interval 650–250 B.P. This division of the sunflower family is associated with disturbed areas, although others of the division native to coastal southern California are not: elegant microseris (*Microseris elegans*) and silver puff or small-flowered Douglas microseris (*M. douglasii*), for example. Thirty to sixty percent Liguliflorae pollen indicates high disturbance levels, consistent with the increased human activity of this time interval. High frequencies of charcoal fragments. (Boxt et al. 1999:29, 32.)

4. *Chenopodiaceae-Amaranthus* Zone: This pollen zone extends from 2.8 feet below ground surface to the modern surface and dates from 250 B.P. through the present day. Vegetation trends observed at this time are the consequences of European occupation and land use. (Boxt et al. 1999:32.)

Pollen data from 1050–650 B.P. (*Artemisia* pollen zone) show significantly more aridity-adapted vegetation communities compared to data from recent centuries. At this time, salt-tolerant species encroached on Bouton Creek from Alamitos Bay, up to 1.8 miles distant, indicating a period of low freshwater (that is, Bouton Creek) discharge. Boxt and colleagues also identified a paleosol at Bouton Creek (Boxt et al. 1999:32, Figure 2). Combined with pollen data from Davis's first Newport Bay core sample, Boxt et al. (1999) hypothesizes that severe and prolonged droughts characterized the 1050–650-B.P. interval (Vellanoweth and Grenda 2002:79).

After 650–550 B.P., rapid sedimentation along Bouton Creek seems to signify the onset of Little Ice Age conditions. Increased freshwater flow and human occupation/use of the Bouton Creek drainage. (Boxt et al. 1999:27–28.)

During the Little Ice Age, after 650 B.P., moisture levels in the Long Beach area dramatically increased. These researchers note that greater than 100 years of urban development in Long Beach has, "typically entombed the margins of Alamitos Bay beneath meters of construction fill, preserving a record of past cultural and environmental events." (Boxt et al. 1999:25.)

[9] Sagebrush genus (Ornduff 1974:46).

[10] Ostracods are small, bivalve crustaceans that are abundant in the world's oceans and also live in freshwater (Rhodes et al. 1962:98).

[11] Generic and specific identification according to Johnson and Snook (1967:422, 456, 457).

The nineteenth-century climate on the southern California coast was a little different than today's climate. Northwesterly winds dominated then as today, although southeasterly winds were more frequent and intense, likened to hurricanes. The turn of the twentieth century heralded reduced influence of southeasterly winds and the Little Ice Age (450–50 B.P.) ended with five El Niño events in a 20-year period. (Engstrom 2006:850–851.)

PREHISTORIC SETTING

The supplemental application for certification's (SAFC's) prehistoric setting relies on a recent synthesis of regional prehistory (Byrd and Raab 2007), as well as major local archaeological investigations. The regional prehistoric setting is essentially discussed in four parts: ancient sites (commonly referred to in the archaeological literature as Paleoindian and Paleo-Coastal traditions), Early Holocene (11,500–7550 B.P.), Middle Holocene (7950–1450 B.P.), and Late Holocene (1450 B.P.–present). (AES 2015a:5.3-6–5.3-8.) Staff finds much of the SAFC's prehistoric setting to be correct and will not repeat it at length here. However, staff provides supplementary information in this section in order to analyze the proposed Alamitos Energy Center's (AEC's) potential to affect archaeological resources. Staff provides additional information in the following areas: (1) clarification of the regional chronology and culture history and (2) the character of local archaeological resources.

Regarding chronology, some archaeologists discuss trends in prehistory against either an arbitrary framework or a timescale that is meaningful in other disciplines, such as geology. For example, Byrd and Raab (2007:217) discuss southern coastal archaeology against a geological timeframe: Early Holocene (ca. 11,700–7700 B.P.), Middle Holocene (ca. 7700–3600 B.P.), and Late Holocene (ca. 3600 B.P.–present).

Archaeologists traditionally view the Terminal Pleistocene and Early Holocene archaeology of coastal southern California as the product of people who focused on extracting resources from the terrestrial environment. These Paleoindians were viewed as originally dwelling in the southern California deserts and using lake and lakeside resources—an economic orientation referred to as the Western Pluvial Lakes Tradition (WPLT)—until Pleistocene-age lakes in the deserts and Great Basin dried at the beginning of the Early Holocene, at which time some WPLT peoples migrated west to the coast and adjusted their food-getting strategies. (Byrd and Raab 2007:217.) The presence of archaeological sites on the Channel Islands[12] at the beginning of the Holocene Epoch (Braje et al. 2014:122), however, suggests that the southern California coast was not simply colonized by WPLT peoples, but by one or two distinct groups of people. The Early Holocene marine economy (fish and shellfish), described in the SAFC (AES 2015a:5.3-6), has long been equated with the San Dieguito Complex because of assumed links with the WPLT and similarities in flaked stone tools (Moratto 1984:Figure 4; Wallace 1955:218). The marine focus, however, clearly represents a distinct lifeway,

[12] The most reliable earliest dates on Early Holocene archaeological sites in the southern Bight come from San Miguel Island and San Clemente Island (Byrd and Raab 2007:219) and from CA-ORA-64 on the mainland (Erlandson et al. 2007:Table 4.1). The SAFC mentions as examples of Early Holocene (or older) archaeological sites: the "Los Angeles Man" of Baldwin Hills and human remains and artifacts from La Brea Tar Pits (CA-LAN-159) (AES 2015a:5.3-6). Bada (1985), Taylor et al. (1985), and Erlandson et al. (2007:54) have discredited the dating of these finds.

and early coastal sites—situated on bays and estuaries—are now commonly classified as part of the Paleo-Coastal Tradition (ca. 12,000–8000 B.P.) (Byrd and Raab 2007:218; de Barros et al. 2002:Figure 2-5).

WPLT archaeological sites feature leaf-shaped, Lake Mojave, and Silver Lake projectile points; stone crescents; formal and expediently made flake tools; atlatl (spear-thrower) hooks; and micro-cores[13]. Tools for plant processing are notably absent. Presumably, these assemblages represent an economy focused on game hunting. (de Barros et al. 2002:29, 31.) Paleo-Coastal Tradition sites exhibit a similar flaked stone tool assemblage, but differ from the WPLT sites in that the former have yielded pitted stones, asphaltum, pointed-bone objects, and shell spoons and ornaments (Moratto 1984:104, 109). Marine shellfish, fish, and mammals also are dominant at mainland coastal sites (approximately 73 percent of animal remains) compared to pericoastal[14] and other inland sites (25 percent) (Erlandson et al. 2007:61).

Late in the Early Holocene (about 8000 B.P.), the Los Angeles basin archaeological record presents a new culture and adaptive pattern known as the Millingstone Horizon, which persisted in some nearby mountain areas until 1500–1000 B.P. (de Barros et al. 2002:31). The Millingstone Horizon is a distinctive and widespread archaeological complex, found west of the Sierra Nevada from the Baja Peninsula north to Clear Lake (Jones 2008:Figure 1). In the Landing Hill area, south of the project site, Millingstone occupations date from about 5600 to 3000 B.P. Few residential features (hearths, house pits, and refuse dumps) were identified during Millingstone occupation of Landing Hill, although tightly flexed, east–west or west–east-oriented human burials are dated to 5600–3000 B.P. The burials do not appear to have been segregated from habitation areas. The subsistence focus appeared to have been on shellfish. (Cleland et al. 2007:329.) Millingstone sites are recognizable by abundant millingstones and handstones (locally referred to as metates and manos, respectively). Most of the approximately 40 radiocarbon-dated Millingstone sites are located on or near the coast. The relative lack of interior Millingstone traces might not reflect a low inland population density. Rather, Millingstone archaeology in the interior might be buried under younger soils and sediments, or sometimes cannot be firmly dated to the Millingstone period for lack of dateable materials, such as bone and charcoal. (Glassow et al. 2007:194.)

A second type of archaeological culture or complex is known from Middle and Late Holocene Los Angeles and Orange counties. Known as the Intermediate Cultures (ca. 3000–1350 B.P.), site assemblages are typified by mortars and pestles, basket-hopper mortars, fewer handstones and millingstones, the introduction of the bow and arrow and phasing out of larger dart points, circular fish hooks, and the appearance of stone, bone, and shell beads. Shell beads include two time-sensitive olive snail types and beads made from limpets (*Megathura cremulata*). During major draw-downs of Lake Cahuilla (Salton Sea), Intermediate Culture peoples obtained obsidian from the Obsidian Butte source, although the majority was procured from the Coso Volcanic Field. (de Barros et al. 2002:33–34, 36–37.) At Landing Hill, there was an overall decline in the use of shellfish, although site CA-ORA-261 exhibits abundant consumption of scallops. Treatment of the dead was markedly different from Millingstone occupants in that

[13] Cores are masses of stone from which pieces are detached to make tools.

[14] Near the coast.

cremations were identified at Landing Hill and are clearly spatially separate from habitation areas. (Cleland et al. 2007:329–331.)

The SAFC's description of Late Prehistoric (ca. 1200 B.P.–Spanish contact), termed therein "Late Holocene", accurately describes the major archaeological trends of this period: abandonment of larger projectile points in favor of smaller points suited to the bow and arrow, concentration of populations into larger villages, proliferation of satellite temporary camps and single-task sites, and the development of what became the Gabrielino society known from the historic period. (AES 2015a:5.3-7–5.3-8.)

ETHNOGRAPHIC SETTING

Gabrielino Tongva

The Gabrielino people and representative tribes are the Native Americans most directly related to the project vicinity. The Gabrielino Tongva have traditionally been split into four subgroups based on the dialect of the Gabrielino Tongva language spoken: those of the Los Angeles Basin/Gabrielino proper, those of the northern mountainous area including the inland San Fernando Valley/Fernandeño, those of Santa Catalina and San Clemente islands, and those of San Nicolas Island (Harrington 1962:viii). Earlier anthropological linguists asserted that the Gabrielino were a Cupan speaking group (i.e., a language of the Uto-Aztecan stock of the Takic language family) (see Bean and Smith 1978:538), but it is now generally accepted that the Gabrielino language is a stand-alone Takic language, distinct from the Cupan sub-group (Mithun 1999:539).

The name 'Gabrielino' is derived from the Spanish missionaries who established Catholic missions in the Los Angeles basin in the late 1700s. Two missions were established in the soon-to-be-renamed tribe's territory: San Gabriel Archangel (initially established near Montebello in 1771, but moved to San Gabriel in 1776) and San Fernando Rey de España (established in 1797 in what is now Mission Hills), respectively named after the biblical angel Gabriel and Saint Ferdinand, King of Spain. Those indigenous Californians closest to Mission San Gabriel became known as 'Gabrielinos' and those closest to San Fernando Rey de España became known as "Fernandenos". However, today the term 'Gabrielino' is applied to all groups indigenous to the Los Angeles Basin.

Prior to the Spanish period it has been suggested that the Los Angeles Basin Gabrielino referred to themselves as *Kumi vit* and the San Fernando Valley indigenous as *Pasekarum* (Bean and Smith 1978:548). However, a word that is combined with the suffix '*vit*' refers to a person from a specific place or village and therefore would not be suitable in reference to a group of people occupying at least 50, if not 100 villages (Johnston 1962:10).

The word '*Tobikhar*' seems to have been used in self-description by those Gabrielinos in the 1800s that moved to the missions. The name translates as "settlers" and appears to reference the fact that some Gabrielino left their traditional villages, whether willfully or under duress, and settled near the missions (Hodge 1971:480). The name *Pepii'maris,* initially used to identify those from Santa Catalina Island, was also adopted by some Gabrielino during historic times to identify themselves (McCawley 1996:10). The words *Kizh* and *Kij* also appear in the literature, but likely refer to people of a

specific house. However, one extant Gabrielino group today, the Gabrielino Band of Mission Indians (aka the Kizh Nation), takes the word 'Kizh' to mean "houses", and referential to all people who lived in the Gabrielino-style willow constructed house. The word '*Tongva*' was provided to anthropologist C. Hart Merriam in 1902 by a Gabrielino speaker (Heizer 1968:105). Loosely translated as "people of the earth"[15], 'Tongva' has gained popularity since the 1990s and is sometimes used in conjunction with the word 'Gabrielino' (McCawley 1996:10), although at least one Gabrielino group (the Gabrielino Band of Mission Indians) rejects use of the word 'Tongva'.

In 1811 about 30 "Kodiak" Indians, equipped with fire-arms for hunting sea otters, set sail on a ship owned by Boardman & Pope from the port of Sitka (in what is currently Alaska). Captain Whiltmore dropped the Alaskan Natives off on San Nicolas, and a "dispute arose between the Kodiaks and the natives of the islands, originating in the seizure of the females by the Kodiaks" (Anonymous 1857:348). The males were slaughtered and Captain Whiltmore returned to the island at the end of the year and took the Kodiaks back to Sitka (Anonymous 1857:348). The remaining San Nicolas Island Gabrielinos were removed in 1835, with the exception of one woman who remained on the island to search for a lost infant. The woman did not find the baby, but continued to live on the island, in isolation. She was removed from the island and brought to the Santa Barbara Mission in 1853, where the Chumash speakers could not understand her dialect (Hardacre 1971:272–284). Additionally, Kroeber corroborates the "Lone Woman of San Nicholas" story (Kroeber 1976:633–635). Recently, archaeologists have re-discovered the cave that the lone woman occupied during her 18 years of isolation (Schwartz and Vellanoweth 2013:391).

Some earlier references to the island dwellers and their immediate mainland coastal neighbors or relatives refer to the entire maritime-adapted culture as the "Canaliño Culture" (Johnston 1962:96; Moriarty 1969:16; Romer 1959:241). However, the usage, a Spanish word attributed by the earliest Spanish maritime explorations in the region, appears to include both the cluster of southern island dwellers that are affiliated with the Gabrielino, in addition to the cluster of northern island dwellers that are affiliated with the Chumash. The Santa Catalina Island is named *Pimu* or *Pipimar*, and the Gabrielino Tongva from *Pipimar* were called *Pepimares* (translated as "people of Pipimar") (Kroeber 1976:634, McCawley 1996:10). Despite not having a common name for the dwellers of the island, some ethnographers suggest the island cultures (and particularly those from Santa Catalina Island), were the originators of the Gabrielino Tongva culture (Moriarty 1969:2). Kroeber (1976:621–622) suggests that the religious practices affiliated with *Chinigchinix* may have originated at the Islands as well, and was then propagated to the Luiseño and Diegueño groups to the south.

Today, the names Gabrielino, Tongva, or Gabrielino Tongva seem to be the preferred references of the indigenous groups from the Los Angeles Basin. The name Gabrielino Tongva will be used for the purposes of this staff assessment, except when referring to specific tribal entities that identify by other names.

[15] McCawley (1996:9–10) suggests that the world Tongva originally named either the Gabrielinos living near Tejon or a separate Gabrielino village called *Tonjwe*.

Traditional Territory of the Gabrielino Tongva

The prehistoric Gabrielino Tongva are recognized as one of the groups with great wealth and population, and who controlled one of the most resource-rich territories in all of indigenous Southern California. Their territory consisted of ocean islands and waters, coast line, riverine basins, and mountains that provided a diversity of resources. (Bean and Smith 1978:538.)

The territorial boundaries, while imprecise, are defined here in a counterclockwise direction and starting in the southwestern area of the territory at the mouth of Aliso Creek.[16] The boundary follows the Aliso Creek northeast into the Santa Ana Mountains and crosses the Santa Ana Mountains near Trabuco Peak. Descending the eastern slopes of the Santa Ana Mountains the boundary runs towards the Santa Ana River and follows the river course up to where the San Andreas Rift and the Santa Ana River intersect. The boundary follows the rift in a northwest direction. The territory includes the area south of the crest of the San Gabriel Mountains. The boundary curves back towards the ocean, following generally the area defined by Soledad Canyon. The territory includes all of the San Fernando Valley, the eastern slopes of the Simi Hills and crosses the Santa Monica Mountains where the boundary line comes down to the coastline at approximately where the present town of Malibu is located. The territory includes the three ocean islands of San Nicolas, San Clemente and Santa Catalina, the ocean waters surrounding the islands, and between the islands and the mainland. (Heizer 1968: End Papers map; Hodge 1971:480 (Vol 1); Johnston 1962: Map; Kroeber 1976:620–621, Plate 57; McCawley 1996:3, 22–25; Moriarty 1969:5.) The territory includes the Verdugo Mountains of which the central and highest peak was named "Tongva Peak" in 2006 (Chambers 2001:1–2).

The proposed AEC is located in the coastal portion of the Gabrielino Tongva's mainland territory and adjacent to the, now channelized, San Gabriel River, about 1.5 miles north of where the San Gabriel River empties into the Pacific Ocean. Various historians and anthropologists provide maps of Gabrielino Tongva ethnographic village and camp locations (Heizer 1968: Map; Johnston 1962: Map; Kroeber 1976: Plate 57). All of the maps and accompanying text previously mentioned identify a village that is about 0.5 mile north-northeast of the AEC. The village name, provided in the literature variously as 'Puvunga', 'Pubunga', 'Puvú, 'Pubuna', 'Povuu'nga' and 'Pubu' is located on Alamitos Mesa. Additional information concerning this village site is discussed below.

Sources of Ethnographic Data

The earliest ethnographic sources of information can be found in the records of the Spanish explorers and later missionary records. Of the various documents related to Spanish exploration and subsequent colonization, Father Boscana's manuscript on the religious beliefs of the Gabrielino Tongva and neighboring tribes has provided invaluable information, especially with regard to the *Chingichngish* religion. The earliest attempt at a comprehensive Gabrielino Tongva ethnography is attributed to Hugo Reid, a Scotsman, settler, naturalized Mexican citizen, and spouse of a Gabrielino Tongva woman, Victoria Bartholomea Reid. Reid documented place names and locations of Gabrielino villages, relying, it is assumed, extensively on his wife and her relatives and

[16] C. Hart Merriam (1968) suggests that the boundary is to the north along the Santa Ana River.

contacts for his information. Reid's notes and letters were initially published in the *Los Angeles Star* in 24 weekly installments beginning in February of 1852, and reprinted in the *Star* in 1869. These letters were since republished by Robert Heizer (1968), with extensive notes to provide clarification and context. Friar Zephyrin Englehardt, an historian of the Franciscans, details some ethnographic information in his writings on the California Missions in general (Englehardt 1974) and specifically the two missions located within Gabrielino Tongva territory (Englehardt 1927a, 1927b). C. Hart Merriam conducted ethnographic research with a Gabrielino woman that produced valuable ethno-linguistic information, the notes of which are housed at the University of California, Berkeley's Bancroft Library. Alfred Kroeber wrote the authoritative Gabrielino Tongva section included in his *Handbook of the Indians of California* (Kroeber 1976:620-635). John P. Harrington conducted ethnographic and linguistic studies that included ethnographic inquiry into the *Chingichngish* cult (Harrington 1933) and he produced a Gabrielino Tongva cultural element distribution list (Harrington 1942). Bernice Johnston wrote a summary of Gabrielino Tongva ethnohistory (Johnston 1962). Lowell Bean and Charles Smith co-wrote the Gabrielino section for the encyclopedic *Handbook of North American Indians, Volume 8: California* (Bean and Smith 1978). More recently William McCawley produced a Gabrielino ethnohistory (McCawley 1996) which was followed by a publication, co-written by Claudia Jurmain that is, in part, an ethnography of contemporary Gabrielino Tongva people (Jurmain and McCawley 2009). Additionally, ethnographies of the Gabrielino's southern neighbors, the Luiseño, written by Constance Dubois (1908) and Raymond White (1963) provide valuable information regarding the *Chingichngish* religion and social organization, respectively.

Gabrielino Tongva Trade Affiliations, and their Economy, Resources and Material Culture

The Gabrielino Tongva maintained solid trade relations with all groups that surrounded them, including the Chumash, Tataviam, Serrano, Cahuilla, Luiseño, and Juaneño (Bean and Smith 1978:547; Davis 1961:22). Through these intermediaries, the Gabrielino Tongva were known as far north as the San Joaquin Valley, homelands of the Yokuts, and to the east among the Yuman tribes of the Colorado River. Steatite, some of the highest quality found in all of California, was traded from a source located on Santa Catalina Island as far east as present day central Arizona. In addition, coastal shellfish provided excellent source material for shell disc money and shell beads. Marine mammals were abundant along the Channel Islands, mainland shores, and off-shore rookeries, providing a valuable source of edible and utilitarian resources. Through long-distance exchange, the Gabrielino Tongva received goods such as deer hides, obsidian and white clay pottery. A more localized Los Angeles Basin trading network facilitated the exchange of the resources that result from the rich, local environment that constituted Gabrielino Tongva and neighboring territories. There is some suggestion that local Gabrielino Tongva trading occurred, between the Islands and the coast as already noted, but also between the coast and inland villages. *Najquqar* (Isthmus Cove) on Santa Catalina Island appears to have been the primary steatite export location on the island, and the villages at San Pedro and Redondo were likely two of the main trading hubs for steatite on the mainland (Kroeber 1976:629).

The nearby village site of Puvungna was also likely a major trading center. One of the interpretations of the name of the village is "gathering place", and Native Americans with

whom cultural resources staff has consulted suggest that this means the village was a trading center. It has also been suggested the name Puvunga means “the place of the crowd”, corroborating the indications given to Boscana that this was an important location for large gatherings of Indians (Dixon 1973:3). Moreover, the location of Puvungna, adjacent to the San Gabriel River and relatively near El Camino Viejo de Los Angeles (Latta 1936: End Map), also suggests that it was likely an important trading village.

The Gabrielino Tongva territory is located at the western terminus of one of the most established and extensive indigenous trade networks of North America, previously documented by staff as the Pacific to Rio Grande Trails Landscape (PRGTL) (Gates et al. 2013:4.3-136–4.3-141). The extensive trail system guided people, goods, and ideas between the Southern California Coast and the Southwest (Davis 1961:2–3), and has been used as a migration and movement corridor for at least the last 10,000 years, and probably more than 15,000 years. There are three major travel corridors emanating from the Southern California Coast (in the case of steatite and other goods exported from the Southern Channel Islands, the network extended into the ocean and thus includes the islands) within the PRGTL, and these continue to be major travel corridors today. Interstate highways now overlay all three, and in general, there is a strong, positive correlation between prehistoric Indian trails and modern thoroughfares (e.g., Davis 1961:47–48). The Mojave Desert corridor generally followed the Mojave River, at least at the points where it is above ground, as well as Historic Route 66, and what today are the Interstate 40 (I-40) and I-15 freeways in southeastern California. The southernmost corridor follows for some distance the I-8 freeway, although the trail heads northeast towards Lake Cahuilla (what is now the Salton Sea) instead of cutting across the desert to go to Yuma, before heading southeast again. This trail connected the Pacific with inland areas but also provided access between the Baja California peninsula and interior central Mexico. The middle trail corridor of the PRGTL follows the same route as the I-10 between Los Angeles and Phoenix. After heading in a northeast direction out of the Los Angeles Basin, the trails heads east, paralleling the Transverse Ranges, then continues east towards the Colorado River. From there, the trail continues east towards the Phoenix Basin and onward across the Colorado Plateau, down into the northern Rio Grande Valley.

Long-distance trade networks extended beyond interior California; *Olivella*[17] (olive snail) shell beads from southern California were identified in portions of the northern and western Great Basin (Howard and Raab 1993) and parts of the southern Great Basin, some of which were dated to as early as 10,300–10,000 B.P. (Fitzgerald et al. 2005:Table 2). Shell beads identified from the northern and western Great Basin were dated to the Middle Holocene (5460–4365 B.P.) (Vellanoweth 2001: Table 1), indicating that this interaction sphere extended at least through this period. Evidence for exchange between the Pacific Coast and the Great Basin was identified in the form of stone spheres discovered in both the Great Basin and on the coast (Sutton and Koerper 2005:1), as well as obsidian sourced from the northwestern Great Basin, found in Orange County (Macko et al. 2005:97–98), and additional coastal sites with obsidian sourced from points all over California (Jackson and Ericson 1994:394). The closest

[17] Biologists now classify olive snails as belonging to the genus *Callianax* (Lightfoot and Parrish 2009:234).

obsidian source to the proposed AEC project area is Obsidian Butte, near the edge of the current-day Salton Seashore. When the water level was low enough to access Obsidian Butte, people obtained this obsidian and traded it, but likely to a somewhat lesser degree than other high-quality obsidian sources (Jackson and Ericson 1994:398).

Once the Spanish arrived in the area, they affected the trade between the indigenous groups. The Padres encouraged trading and as they considered the Indians to be free nations, they regarded stopping the trade as a breach of international law. However, military authorities disagreed, particularly on the grounds that trade between indigenous groups was a pretense to start trouble (Farmer 1935:156–157). Thus, there was disagreement between the Padres and military regarding how to treat the indigenous trading relationships, but by 1800 most of the Gabrielino Tongva were either missionized, dead, or had fled to other areas (Bean and Smith 1978: Table 1).

Interaction spheres in Western North America were not limited to the Pacific Coast and the Great Basin, but variously included the Gulf of California, Puebloan groups in the Southwest, and the Colorado River area (Jackson and Ericson 1994:398), and even played a role in the massive trade network of which Chaco Canyon in New Mexico was a major hub ca. 1,100 years ago (Mathien 1993:36). It is important to understand that Southern California, and the Los Angeles Basin more specifically, has likely been a place of migration and movement since not long after initial settlement in the New World. Not only does archaeological evidence allow such an interpretation, but ethnographic evidence confirms this as well. Indigenous understandings of their origins are tied directly to the immediate landscape and homeland in which they live. For example, in versions of the coastal Juaneño[18] creation story, two influential deities, *Ouiot*, the monster-chief, and *Chingichngish*, the supreme-creator god, emerged, at different times, at the village of Puvungna (Boscana 1978:32, 33). Also, Boscana (1978:119) documented that one of the places *Chingichngish* is understood to have died was at Puvungna. Milliken et al. (1997:15) provide a useful summary of the roles of *Ouiot* and *Chingichngish* in the origin stories among the Juaneño and Luiseño,

> [T]hree successive sets of power entities or beings were involved with the creation of the world and institution of religious life. The first generation, a brother/sister set of entities took the form of sky and earth. They created the second generation, the First People, entities whose essences are now found in certain animals, certain ritual objects, and certain rocks, hills, and mountains. One of those entities, *Wiyut* (*Ouiot*), became the “captain” or “father” of all the First People. Following the death of *Wiyut*, the First People assumed their present forms and humans as we know them were created. *Chingichngish,* the third generation of power entities, appeared among people for a short time as a teacher. He remains active in the background of existence, as the source of both positive power and punishment for behavior.

[18] The Gabrielino Tongva were missionized and their culture so thoroughly affected before their oral histories could be documented by Euro-Americans, that there is scant ethnography concerning their origin stories, and thus ethnographic analogy with neighboring groups, such as the Juaneño, is necessary. Moreover, it would be a mistake to assume that there is any one “correct” version of the creation story or *Chingichngish* story (Milliken et al. 19997:16).

The village of Puvungna was also the location where, after *Ouiot* was killed, a very large gathering of *Ouiot's* people conferred and cremated his body. After the ceremonies, the elders consulted each other regarding the collection of food stuffs, and it was at this time that the god *Chingichngish* appeared to the people. It was at the village of Puvungna that *Chingichngish* first taught the people "explaining the laws and establishing the rites and ceremonies necessary to the preservation of life" (Boscana 1978:33). He also taught the people what to wear, how to heal the sick, how to build the ceremonial structure (*yovaar),* how to rear the young, and how to live according to *Chingichngish's* laws (Boscana 1978:33–34).

Moreover, several ethnographic accounts suggest that the Gabrielino Tongva were the center of the Jimson weed/datura/toloache religion (also referred to as the *Chingichngish* [19] religion) and that the neighboring Luiseno, Juaneno, and Chumash fashioned similar ceremonies following the Gabrielino Tongva lead (Bean and Smith 1978:548; Kroeber 1976:626–627; Moriarity 1969:2). The spread of this religion likely followed the same routes that goods and other cultural ideas followed within the Southern California portion of the PRGTL, with the site of Puvungna playing an important role in both the *Chingichngish* religion, because it was the place of emergence of deities, as well as a trading center along the trails which were part of the PRGTL. **Cultural Resources Appendix Figure 1** depicts the spread of the *Chingichngish* religion amongst several Southern California tribes.

As stated earlier, the Gabrielino Tongva territory consists of a wide array of landforms and a related diversity of resources. The territory includes ocean islands, the ocean itself, coastline beaches, estuaries, salt marshes, rivers, riverine basins or piedmonts, foothills, and mountains. The Gabrielino Tongva were proficient at gathering acorns, sage, yucca, cacti, and a variety of other plants, animals, and birds associated with the interior mountains/adjacent foothills, prairie, exposed coast, and the sheltered coastal regions. Saltwater fish, such as tuna and dolphins (i.e., cetacean mammals) were taken from the ocean using plank canoes and tule rafts, and deer were hunted from the piedmont to the mountains. Salt was gathered for daily consumption and for trade inland, notably at Old Salt Lake near the Redondo Beach Generating Station. The coastline extending between San Pedro and Newport Bay, characterized as exposed coast, was an area of secondary subsistence gathering camps adjacent to the coast, with the primary subsistence villages located farther inland (Bean and Smith 1978:539). The closest inland village to the proposed project area is Puvungna (about 0.5 mile north-northwest of the project area), a village important for its religious associations, influence on trade, and historical significance.

Steatite was traded inland, in both raw and fashioned form, and used to construct animal effigies, pipes, cooking vessels, arrow straighteners, ritual objects, plaques known as comals and palettes (a type of armor plate) (Bean and Smith 1978:542, 547). Asphaltum was used to seal water tight vessels including baskets and canoes, and was used to attach rare minerals, shells, and beds to everyday objects and ceremonial

[19] There are at least six variant spellings of the name of the religious tradition. Bean and Smith (1978:548) clarify that the linguistic source is Luiseño and there is no known Gabrielino word for the religious tradition despite being considered to have originated with the Gabrielino and diffused to neighboring tribes.

dress. Bedrock and portable mortars were the predominant food processing materials. In particular, the Gabrielino Tongva were known for the unique practice of specific ownership and transportation of personal mortars. Other items of common use were metates, mullers (pestles), mealing brushes, wooden stirrers, shell spoons, and wooden bowls. Deer scapulae were fashioned into saws. Other bones, shell, wood and chert were fashioned into needles, awls, fishhooks, scrapers, flakers, wedges, shovels, projectile points, cane knives, and drills. Salt was used as a trade item, consumed only in moderation because it was understood to have the potential to cause one's hair to go grey, used in ceremony, and figured in the creation story (Davis 1961; Heizer 1968:23; Johnston 1962:62, 64, 70, 93).

Shell disc bead money was manufactured and used as local currency, and recognized as legitimate currency as far east as the Colorado River. Business transactions, and obligations and payments on debt, were tracked by knotting cordage. Ceremonial rattles were fashioned from gourds. Pottery does not show up in the archaeological record of the area until the Late Mission Period, and was made by coiling and the paddle and anvil technique. Baskets were woven from rushes, grass, and various bushes. Basket types included mortar hoppers, flat baskets, carrying and serving baskets, storage baskets and ceremonial baskets for grave offerings. Baskets were made by women who used the stems of rushes (*Juncus* sp.), grass (*Muhlenbergia rigens*), and squawbush (*Rhus trilobata).* Weapons for war and hunting consisted of war clubs, self- and sinew-backed bows, tipped and untipped cane arrows and throwing clubs and slings.

Planked canoes, fashioned from wooden planks that were tied together with cordage and caulked with asphaltum are a technological feat shared with the Chumash to the north. The large boats were ocean-worthy vessels, capable of handling rough seas, which allowed for deep-sea fishing and travel to the Channel Islands. Marsh and estuary bodies of water were traveled by rush rafts made from tule reeds. (Bean and Smith 1978:542; Heizer 1968:43–46; Kroeber 1976:628–632; McCawley 1996:111–142.)

Men and children went without clothing in the temperate climate. Women wore aprons of deerskin or skirts made from the inner bark of willow or cottonwood trees. Capes used during cold or rainy seasons were made of deerskin, rabbit fur or bird skins woven together with milkweed or yucca fiber. Otter skins were also used, in addition to being traded inland. Ritual regalia were constructed of bird plumage, shells, and beads. Body paint was used during ceremonial events. (Bean and Smith 1978:540; Heizer 1968:23–24; McCawley 1996:11–13.)

Houses were domed, circular and covered with tule, fern or Carrizo reed mats. A large house could hold up to three or four families (~ 50 people), and was perhaps 60 feet in diameter. Smaller homes were as little as 12 feet in diameter. Willow posts (and along the coastline and on the Islands sometimes whale rib bones) were inserted about a pace apart around the circumference of the house. A smoke hole was left at the top of the dome and was covered with a tule mat when not in use. Houses along the coastline had a door which opened towards the sea to avoid the north wind, and the entryway was also covered with mats. A trench was dug inside the door to catch any run-off that might make its way through the matted doorway. The floor was dirt, sprinkled with water and compacted. A hearth was fashioned with cobbles in the center of the house. The

interior of the house was covered with more mats and rugs fashioned out of animal skin and fur. Inland houses and those at higher elevations were semi-subterranean (~ 2 feet deep) in order to conserve heat. Adjacent to houses were wind screens fashioned from posts buried in the ground and from which matting was suspended. These wind screens served as open air kitchens that were used during fair weather; during inclement weather, cooking occurred around the indoor house hearth. Also placed adjacent to the main dwelling were large granary baskets. The granary baskets, sometimes coated with asphaltum, sat upon posted platforms and were the primary storage receptacle for acorns.

Common sweathouses were small semi-circular, semi-subterranean earth covered buildings reserved for adult male use. Sweathouses were sometimes built into banks of washes. The sweathouses were heated by direct fires placed near the door, as the sweathouse was not fashioned with a smoke hole. The sweathouse was positioned near water to provide access for bathing. A larger ceremonial sweathouse probably was also fashioned similar to the common sweathouse, but somewhat larger inside (12 feet in diameter), and featured a smoke hole at the top that also functioned as an entrance into the structure via a ladder. Menstrual huts were also constructed. It is not clear if the menstrual hut was also used for birthing (Heizer 1968:29).

Ceremonial open-aired enclosures, *yoyovars*, were located near Chiefs' houses and the center of villages, and were made of willow posts and willow wicker. The interiors were decorated with feathers and painted posts. The ceremonial enclosures were used for rituals associated with the *Chingichngish* religion, and within the enclosure an effigy of the god *Chingichngish* was placed, and ceremonial sand paintings featuring depictions of the sun and moon were drawn on the ground, which were used for divination. Only the most revered of the village's male leadership, male initiates and female singers were permitted to enter. McCawley (1994:3–17) suggests that the ceremonial house was usually situated near a permanent sources of water. In the case of Puvunga, the closest permanent water source was a spring located on the southeastern slope of Alamitos Mesa, near the present land holdings of the Rancho Los Alamitos. During funeral ceremonies the grieving family members were allowed to enter the sacred enclosure. Some villages featured a second ceremonial enclosure that was not consecrated and was used for instruction and practicing upcoming rituals.

Villages also featured leveled fields surrounded by posted fences for sporting events. Larger villages were thought to have populations of as many as 1,500 people. Cemeteries were located outside of but immediately adjacent to villages. Gravesites were sometimes marked by baskets or slabs made from sandstone, or blue schist on Catalina Island, decorated with etched figures commemorating the deceased. (Bean and Smith 1978:542; Kroeber 1976:628; McCawley 1996:27–30.)

Gabrielino Tongva Political Organizations and Religious Practices

The missionary conversion process, coupled with a high rate of disease caused many deaths and a loss of traditional knowledge, thus leaving the Gabrielino Tongva cultural traditions incredibly fragmented by the time that anthropologists arrived to document what remained of the traditional culture. Therefore, less is known about traditional Gabrielino political organization and religious practice than some of the neighboring tribes, such as the Luiseño, Cahuilla, Serrano and Chumash. However, some analogs

between these neighboring groups and the Gabrielino Tongva can provide interesting and valuable information.

Based on the limited information available regarding Gabrielino Tongva social organization, they most likely adhered to a moiety kinship structure, somewhat mirroring the organization of their Juaneño and Luiseño neighbors. In addition, crosscutting the kinship system were three social classes. Social classes tend to appear in societies that have evolved in environments that provide an abundance and diversity of resources. Gabrielino Tongva society maintained an elite class who spoke a specialized language, and included hereditary chiefs and the very wealthy. There was a middle or commoner class who were modestly wealthy and from fairly reputable lineages. There was a lower class of everyone else: the poor, disreputable, slaves, or those of ill fate. Marriage or wealth accumulations were the prime avenues for social movement within the class system. There were also social organizations and guilds of craftsmen that cross-cut village social structure and could include members from neighboring tribes. Property ownership was practiced by some Gabrielino Tongva and these property boundaries were marked by painting a copy of the owner's personal mark on nearby trees, posts and rocks (Bean and Smith 1978:543, 545; McCawley 1996:10).

Villages were comprised of non-localized segmentary lineages. One or two lineages may have dominated a particular village for a period of time but dominance was not permanent or guaranteed. Regardless of moiety or class affiliation, political autonomy occurred most effectively at the village or "tribelet" level, with the dominant lineage's leader assuming the village chief position. The leadership was manifest in the possession of the village sacred bundle and possession of a chief name. Leadership tended to be passed through male descent, unless the other village lineage leads could agree, either that there was no one in the controlling lineage that existed, or there was no one of the dominant lineage that was competent to lead. Leadership at times could be passed to daughters. Village chiefs could combine and preside over more than one village, and this could be done by alliance agreement or by having multiple wives, each in a different village. Larger villages could segment with some of the lineage forming a hamlet that still held allegiance to the parent village. A large and wealthy village could have multiple radiating hamlets or camps. Over time these smaller villages could rise to dominance and overshadow the parent village (Bean and Smith 1978:544).

A village leader's responsibility was to protect the sacred bundle, collect taxes from the village houses, settle disputes, make decisions of war, negotiate peace treaties, and to generally live an exemplary life. The village leader could be assisted by an announcer, a tax collector/treasurer, general assistants and messengers/runners. However villages also had shamans who from time to time could trump the authority base of the village leader (Bean and Smith 1978:544).

Shamans gained their power and knowledge directly from the Great Spirit when in Jimson weed-induced states. Shamans could cure or cause calamity and illness, they were known to divine, and knew, collected and dispensed various herbal and animal remedies including poisons for weapons. Shamans were responsible for conducting the yearly mourning ceremonies for grieving families of the deceased. While village leaders or chiefs protected the sacred bundle, shamans were responsible for the spiritual protection of the sacred bundle. The shamans from the Santa Catalina Island were

considered to be the most powerful and were accorded due respect. It was also understood that the *Chingichngish* religion was brought to the mainland by the religious leaders of the island (Bean and Smith 1978:544; Johnston 1962:97; Kroeber 1976: 621–622; also see Hudson 1979).

Gabrielino Tongva religious beliefs and practices are not documented as well as other indigenous groups in the region, but it appears that they, and perhaps those living at Santa Catalina Island specifically, were the first to understand the toloache ceremonies which involved ritual consumption of Jimson weed (Kroeber 1976:621–622). This practice spread to distant tribal nations throughout Southern California and into the southern Central Valley (**Cultural Resources Appendix Figure 1**). The consumption of Jimson weed was associated with the deity *Chingichnich*, a deity who emerged at the village site of Puvunga and taught the people how to live according to the tenets of this religion. Father Boscana (1978:33) wrote in the nineteenth century that *Chingichnich* taught the Gabrielino Tongva "the laws and establishing the rites and ceremonies necessary for the preservation of life." These laws included ideas regarding ritual observances, obedience to authority, economic reciprocity, family and social obligations, child rearing and hygiene, and provided the society with a strict moral, political, economic and legal code. Punishment for breaking these rules could include death for the most serious of offenses (McCawley 1994:2-37). Participants of this religion were inducted into the practice during adolescence, at a ceremony in which they gained insight into the nature of the world and the tribal and individual role and place in the universe. This insight provided success in hunting, warring or other activities of importance to the survival of the village over time (Kroeber 1976:626; McCawley 1996:143–169; Moriarty 1969.)

Gabrielino Tongva Burial Knowledge and Practice

Burial beliefs and practices stem from the instructions of *Chingichnich* before he departed this world. There was a concept of an afterlife, place of heaven, and something similar to the Christian concept of purgatory[20]. Upon death, characterized as the breath leaving the person, it was understood that the heart of the person did not die, but, through proper ritual, was transported to heaven or purgatory. Heaven was understood to exist to the west, beyond San Clemente Island. At this "distant mountain in the sea" a benevolent god presided and all was good. For those who had imperfectly practiced *Chingichnich's* instructions, a purgatory-type place to the east "in the hills" where one's heart would reside indefinitely until the god determined that proper penance had been performed.

After death, a wake occurred for three days and general mourning commenced. The body was wrapped in a blanket, mat, net or seaweed. After the wake, the body of the deceased was carried in procession to the village burial area where the burial commenced. Mainland Gabrielino Tongva tended to conduct cremations, while the Island Gabrielino Tongva adhered to flexed burial practice. The hands were placed across the breast, and the entire body was bound. The portion of the coastal mainland,

[20] Some scholars (e.g., Hudson and Blackburn 1978:247) suggest that the *Chingichnich* religion was a post-contact concept, which is why there are elements of Christianity in some of the practices. Other scholars (e.g., McCawley 1994:2-33) suggest that these Christian-like elements were present prior to the arrival of Europeans and are a result of organic anthropological religious evolution.

from Ballona Creek to the San Gabriel River, where Island Gabrielino Tongva had the strongest relations, tended to also practice flexed burial internment. For those villages adhering to cremation, the remains were either interred or disposed of to the east of the village. Grave offerings were buried with the deceased or, in the case of cremation, burned with the corpse. Some internments featured dog burials placed above the corpse. The Gabrielino Tongva saw the worlds of the living and the dead to be parallel places; therefore the items buried or burned with the deceased were intended to accompany that person to the afterworld where their statuses were recognized by the items that accompanied them. To loot a grave today is perceived by traditionally minded Gabrielino Tongva to be a robbery of the deceased's status in another world. After the funeral ceremony, the living mourned for a year, and women singed or cut their hair initiating the mourning period. Every fall, after the harvest ceremonies, an annual mourning ceremony was conducted for all of those who had died in the past year (Bean and Smith 1978:545–546; Heizer 1968:29–31; McCawley 1996:155–158.)

Contemporary Tribal Entities with Ethnographic Affiliations

There are various Gabrielino Tongva tribes, nations and other organizations. Names are very similar and it is difficult at first glance to differentiate between the groups. The Native American Heritage Commission list provided to staff (Singleton 2014) provides additional tribal names that represent Gabrielino Tongva people and culture. Tribal entities are listed below.

Gabrielino Band of Mission Indians – Kizh (Kitc) Nation

This tribe does not affiliate with the name "Tongva", asserting that it is a twentieth century appellation, and instead prefers the name 'Kizh' (Kitz). They understand that 'Kizh' refers to houses made of willow, tule and brush, and refers to all the people that lived in such houses, ostensibly all "Gabrielinos". The Tribal Council of seven seeks federal recognition and is an advocate for the protection of cultural resources[21].

Gabrieleno/Tongva San Gabriel Band of Mission Indians

The apparent website for this tribe, http://www.tongva.com, is not current.

Gabrielino/Tongva Nation

This tribe ratified their constitution in 2007, and subsequently received a Letter of Recognition from the Mayor of Los Angeles in addition to a resolution from the Los Angeles City Council acknowledging the heritage of the Gabrielino/Tongva Nation. In addition to a nine-member Tribal Council (*Peo'tskome*), this Tribe also maintains a Citizenship Board, an Elections Board, and a Citizenship Advisory Committee[22].

Gabrielino-Tongva Tribe

The Gabrielino–Tongva Tribe currently has offices in Los Angeles, but the offices were located in Santa Monica as recently as 2007. The tribe ratified their constitution in 2007, and is guided by a council of seven. The tribe has been involved in efforts to establish a

[21] www.gabrielinoindians.org.

[22] http://gabrielino-tongva.com.

casino resort in the Los Angeles area and also maintains a college scholarship program for tribal members[23].

Gabrielino/Tongva Indians of the California Tribal Council

This tribe does not appear to have an associated website and no background information is currently available.

Tongva Ancestral Territorial Tribal Nation

This tribe does not appear to have an associated website and no background information is currently available.

Ti'at Society/Intertribal Council of Pimu

The Ti'at Society was formed in the late 1980s in an effort to resurrect the maritime culture of the Gabrielino Tongva people (Williams 2013). This group constructed a traditional plank canoe which is housed at CSULB, and it participates in the annual Channel Islands crossing off the coast of Southern California[24].

Los Angeles City/County Native American Indian Commission

This commission was established in 1976 through a joint effort of the Los Angeles American Indian community, City of Los Angeles, and Los Angeles County. The "primary purpose of the Commission is to increase the acquisition and application of funding resources to the socioeconomic problems of American Indians in Los Angeles City and County without duplication of any service or activity provided by any other County officer or department" (LACCNAIC 1993).

Currently, none of the Gabrielino Tongva groups are federally recognized tribal entities, and thus are unable to receive federal monies for health programs and other social and economic benefits. However, in 1994 the California Legislature passed Assembly Bill No. 96 (recorded by the Secretary of State on September 13, 1994 as Resolution Chapter 146 of the Statutes of 1994), a bill which recognized the Gabrielino as the original inhabitants of the Los Angeles Basin, and encouraged the President and Congress of the United States to similarly recognize the tribe. Additionally, in 2007 the Mayor of Los Angeles signed a recognition letter congratulating the Gabrielino/Tongva Nation for ratifying their constitution[25], and the Los Angeles City Council also signed a resolution supporting the Gabrielino/Tongva Nation in their efforts for federal recognition[26]. There was a proposed Senate Bill (SB) also in 2007 (SB 1, proposed by Senators Oropeza, Scott, and Yee) which would have established a reservation for the Gabrielino Tongva in the Los Angeles area, but without gaming rights. However, the bill was dropped by its sponsors a short time after being introduced.

[23] http://www.gabrielinotribe.org.

[24] http://www.csulb.edu/colleges/cla/departments/americanindianstudies/wp-content/uploads/2014/04/Tiat-Fliers.pdf.

[25] http://gabrielino-tongva.com/documents/Recognition.pdf.

[26] http://gabrielino-tongva.com/documents/resolution.jpg.

HISTORIC SETTING

Spanish Period (1769–1821)

By the middle of the sixteenth century, Spain had emerged as the premier naval and military power in Western Europe, with colonies in North and South America and a trading network throughout the Pacific. On September 28, 1542, Juan Rodriguez Cabrillo arrived in San Diego aboard the *San Salvador* and claimed the land in the name of Spain (SDHC 2012). In November 1602, Sebastian Vizcaino arrived in San Diego, surveying the coastline and getting as far north as Oregon (SDHC 2012). In the late 1770s, Antonio Maria de Bucareli, the Viceroy of New Spain, "legitimized Spain's claim to Alta California by making it the new *Provincia de California* [Province of California] with a provisional capitol at the Presidio at Monterey" (Steiner 1999:6). Bucareli's plan was to use the missions to colonize the new province. While the Spanish explored the coast of present-day California in the mid-sixteenth century, it was not until the incursion of Russian and British explorers into what are now Alaska, British Colombia, Washington, and Oregon in the 1750s that the Spanish made serious attempts to colonize Alta California (Steiner 1999:4–6). It was Bucareli who ordered Juan Bautista de Anza to lead an exploration to establish overland routes from Sonora (present day Arizona) and New Mexico in order to facilitate the colonization of California and provide a stable supply route (Steiner 1999:8). Over 150 years passed before the Spanish attempted permanent settlement.

The Spanish colonization of California was achieved through a program of military-civilian-religious conquests. Soldiers secured areas for settlement by suppressing Indian and foreign resistance and establishing fortified structures called presidios. Civilians established pueblos (e.g., towns) and Spanish priests led the religious conquest by establishing missions and converting the Indians. The Spanish built 21 missions in California with the local Native American tribes serving as the dominant source of labor at the missions. Pasture lands were divided among the missions and beneficiaries who were awarded land grants by the Spanish and Mexican governors of Alta California. These beneficiaries were often former soldiers or others who had served the government.

In 1784, Pedro Fages, Spanish governor of California at that time, granted 300,000 acres, which included today's Long Beach area, to Manuel Nieto, a Spanish ex-soldier, as a reward for his military service. Nieto built an adobe home and raised cattle, sheep, and horses on his Rancho Los Coyotes. Upon his death in 1804, his rancho passed to his heirs. (APD and HRG 2009:8.)

Mexican Period (1821–1846)

In 1822, Mexico achieved independence from Spain, and California became an outpost of the Mexican Republic. In 1834, Nieto's Rancho Los Coyotes was divided into five smaller ranchos, including two that would eventually encompass the majority of Long Beach: Rancho Los Alamitos and Rancho Los Cerritos (APD and HRG 2009:8). The other three were known as Rancho Santa Gertrudes, Rancho Las Bolsas, and Rancho Los Coyotes (Hoover et al. 1990:148).

By the 1840s, there was a steady migration of American settlers into California. Unable to stop the incursion, the Mexican government granted citizenship to all who would pledge to follow Mexican law. Many of these foreigners received land grants on which they established grazing and commercial operations. In the Long Beach area, an American ranchero known as Don Abel Stearns purchased Rancho Los Alamitos in 1842 as a summer home and cattle ranch (APD and HRG 2009:8). Massachusetts-born merchant John Temple, a Los Angeles-area land investor, acquired Rancho Los Cerritos in 1843 and maintained a lucrative business raising cattle and shipping hides out of San Pedro Harbor to the west of Long Beach on the opposite side of San Pedro Bay (APD and HRG 2009:9).

War broke out between the United States and Mexico in May 1846, with some decisive battles occurring in California. The American victory over Mexico was formalized in February 1848 with the signing of the Treaty of Guadalupe Hidalgo, and Mexico ceded all its land holdings above the Gila and Rio Grande rivers to the United States.

American Period (1848–present)

In 1848, the discovery of gold at Sutter's Mill in northern California launched the California Gold Rush. In 1850, California was granted statehood and its first 27 counties were established. Completion of the transcontinental railroad in 1869 and later the reach of Southern Pacific Railway and the Atchison, Topeka and Santa Fe Railway into Southern California in 1876–1877 spurred a development boom. The ranchos gave way to town developments and resort destinations. Shipping and transportation via rail and ship now allowed for related business development to take place along the shoreline and interior areas of Southern California.

The Gold Rush gave a boost to the Southern California cattle industry by providing a need for hide, tallow, and meat. Ranching was a lucrative enterprise for the two Long Beach area rancheros, Stearns and Temple, who profited greatly during the 1850s. However, a catastrophic flood in 1861–1862 and a severe drought during the following years resulted in a substantial loss of cattle, causing Stearns to lose his Rancho Los Alamitos. It was later acquired by John Bixby in 1878–1881 through a lease and partnerships with Jotham Bixby and Isaias Hellman. (APD and HRG 2009:41–42.) Soon after, Jotham Bixby acquired the neighboring Rancho Los Cerritos. Together, they formed the Alamitos Land Company and began to develop town lots with oceanfront property (Jurmain et al. 2011:106–107). In 1884, the town of Long Beach was laid out to occupy the southwest corner of the Rancho Los Cerritos. The land holdings of the Bixby Ranch were slowly sold off for development throughout the late nineteenth and early twentieth century. Meanwhile, the core of the ranch continued to operate as primarily a dairy and alfalfa producer through the 1960s. (APD and HRG 2009:42.)

Long Beach History

Long Beach was originally planned and developed by William Willmore in 1881 as a 350-acre town site that he named Willmore City (APD and HRG 2009:43). He promoted the town as a tourist destination and settlement, highlighting its fertile soil and beautiful beaches. Willmore was unable to produce adequate interest in the location and soon was facing financial difficulties forcing him to sell his interest in the development.

The San Francisco-based real estate firm of Pomeroy & Mills purchased the property from Willmore in 1884, renamed the town Long Beach, and formed the Long Beach Land and Water Company (APD and HRG 2009:44). Under new management, the town began to prosper by the following year and featured numerous residences, businesses, a church, and a local newspaper. Expansion of the railroad networks in the Los Angeles region brought thousands of families into the area from the Eastern United States resulting in a population explosion that sparked further growth and development of Long Beach. The City of Long Beach was incorporated on February 10, 1888 (APD and HRG 2009:45). By the 1890s, Long Beach had became one of the premier resort beach towns and boasted many attractions including two pleasure piers and a railroad line connecting to Los Angeles.

The population of Long Beach continued to grow at the turn of the twentieth century, leading to the annexation of surrounding areas until the city had expanded to approximately 10 square miles in size. By 1906, the Los Angeles Dock and Terminal Company began dredging the marshlands along the coast to build the Long Beach Inner Harbor (APD and HRG 2009:47). The following year, ship builders from around the nation began to take interest in the facilities and set up ship-building at Long Beach. The Port of Long Beach opened in June, 1911, and the U.S. Navy designated Long Beach as the headquarters for its Pacific Fleet in 1919 (APD and HRG 2009:47, 50). Commercial and residential development continued at a steady pace through the 1920s and the Long Beach Airport was established in 1924 (APD and HRG 2009:50).

Oil discovery at Signal Hill in 1921 brought radical changes to Long Beach as speculators, promoters, and an influx of workers descended on the area within a few short years hoping to make money on the oil industry (APD and HRG 2009:48). The influx of money transformed the downtown area with the construction of high-rise buildings and elegant hotels and apartments. The City's harbor also experienced a growth spurt as a result of the oil boom, as the oil industry depended on the harbor to export its production. In response to the need to expand the harbor, tidelands and submerged areas were dredged and built to support construction of channels, breakwaters, docks, landings, and warehouses. By the 1930s, Long Beach Harbor was handling as much as one million tons of cargo each year. The U.S. Navy had well over 50 ships at Long Beach Harbor and approximately 8,500 servicemen. (APD and HRG 2009:50.)

As in other parts of the country, Long Beach was severely affected by the Great Depression following the stock market crash of 1929. Many businesses closed and their buildings stood vacant or abandoned. Real estate values plummeted and the tourism industry was at a standstill. Meanwhile, the population continued to grow, although at a much slower rate than it had the previous decade.

A magnitude 6.4 earthquake struck Long Beach in 1933, causing the death of 120 residents and over $50 million in damage (CDC 2013). Over 100 public schools were badly damaged, of which 70 were destroyed. Fortunately the quake occurred in the early evening hours when the schools were empty. The earthquake served as an impetus to pass the Field Act of 1933, which required earthquake-resistant design and construction for all public schools.

As the decade of the 1930s progressed, Long Beach's defense industry continued to grow. A naval base on Terminal Island was created in 1937. A second naval base was constructed in 1941 that included a shipyard and hospital. That same year, a substantial breakwater was constructed to protect as many as 30 square miles of anchorage. In 1940, Douglas Aircraft Company built a 242-acre production plant next to the Long Beach Airport, which later proved critical to the United States involvement in WWII. (APD and HRG 2009:51.)

In the 1950s, Long Beach experienced a population boom of ex-servicemen and their families who decided to settle in the area permanently after the war. To meet the demand of a rapidly growing population in the post-war baby boom, the City expanded by annexing 69 new tracts of land, most of which were to the east of the city limits, comprising as much as nine square miles (APD and HRG 2009:52). Many of these former agricultural areas were transformed into suburban communities. To meet the needs of these new communities, numerous commercial centers were also built. In response to a need for educational facilities, California State University, Long Beach was established in 1949. The post-war development boom also brought the need for greater infrastructure and civic improvements, including freeways, hospitals, parks, museums, and marinas.

Military downsizing slowed the growth of Long Beach in the 1960s and 1970s, but an influx of emigrants from Southeast Asia, Mexico, and Central and South Americas in the 1980s spurred a new period of growth. Today, the City of Long Beach spans 50 square miles and has a population of over 470,000 people. It is the sixth largest city in California, and is one of the most ethnically diverse. At present, the economy is supported by a number of industries, including aerospace, manufacturing, shipping, healthcare, education, and tourism. The Port of Long Beach, per cargo tonnage handled annually, is reported to be the busiest port on the West Coast. (APD and HRG 2009:54.)

Steam Generation Electric Plants in California

Early History

Built in 1879, the Brush Plant in San Francisco was the first central generating station on the west coast to produce and distribute electricity on demand to customers. Prior to Thomas Edison's invention of the incandescent electric light bulb in 1879, only the electric arc system was available, which turned out to be unsafe for indoor use. (Myers 1983:11.) Edison is also known for improving the generation and distribution systems for electricity, which truly opened up the consumer market. This "central station" concept was to become the cornerstone of the electric utility industry (Myers 1983:11).

Hydroelectric power was the dominant form of electric generation in California in 1920. By 1940, it grew to 89 percent of the state's market. However, by 1960, steam generating plants became the primary source of electricity in California as hydroelectric generation had fallen to 27 percent (JRP 2013:5).

Power generating plants constructed before WW II were typically housed in an architectural shell with a recognizable style of design. In the early part of the twentieth century, this was partly an outgrowth of the City Beautiful Movement, which sought to

create order and beauty in the urban landscape. San Diego Consolidated Gas & Electric Company's Station B (1911) and Sacramento's Pacific Gas and Electric Company's Station A are examples of this early Beaux Arts-based Classical Revival presentation of an edifice housing the turbines, generators and various facilities of a steam generating electric plant. The Beaux Arts expression of classicism, popular between 1885 and 1930, was typically more exuberant in surface ornamentation than other Classical Revival styles of the time. The style was influenced by the design principles of ancient Greek and Roman structures. By the end of the nineteenth century, less dramatic forms emerged, known as Classical Revival. The original Pacific Light and Power Company steam plant at Redondo Beach, constructed in 1906, was also emblematic of the Classical Revival style. All of these featured arched fenestration (e.g., doorways and windows), distinct cornice details, rhythmic patterns with respect to windows and wall relief, columns or piers, and spacious interior volumes housing the equipment.

Later examples adopted the architectural style of their times. The City of Vernon's Station A, built in 1932 is an excellent example of the Art Deco style of architecture popular at the time in Southern California. Art Deco was an early expression of the Modernist style of ornamentation that was popular in American culture during the 1920s and 1930s, appearing in the design of architecture, furniture, jewelry, pottery, and household appliances. A later addition to San Diego's Classical Revival style Station B (1928–1939) was constructed in the Spanish Revival and Art Deco styles. The Spanish Revival style, popular in Southern California during the 1910s–1940s, was inspired by the Spanish Colonial and Mexican adobe buildings of Southern California's earlier centuries.

The Southern California Edison Company

Southern California Edison (SCE) is one of the largest electric utility companies in California, serving more than 13 million people throughout 15 counties (OAC 2009). Headquartered in Rosemead, California, SCE has been providing electric power to the region for more than 120 years. Their service territory covers approximately 430 cities and unincorporated areas, with a total customer base of approximately 4.8 million residential and business accounts. The following discussion of the history of SCE is heavily drawn from William A. Myers' (1983) definitive history, *Iron Men and Copper Wires: A Centennial History of the Southern California Edison Company*.

The earliest history of the SCE Company dates back to the 1880s, when its first ancestral utility providers were organized (Myers 1983:8, 13). By 1886, the earliest of the predecessor companies, Holt and Knupp, illuminated the streets of Visalia, California (Myers 1983:13). Other small utility companies followed suit and were soon generating electricity for street lights to towns throughout southern and central California. Demand for electricity grew during the 1890s, and several different Southern California electric companies emerged to produce electric power from various hydroelectric facilities in the region.

In Los Angeles, the Los Angeles Electric Company had been operating since 1882, but was unable to fill the demand for residential and industrial electric power service (Myers 1983:32). In 1896, the West Side Lighting Company incorporated after successfully supplying power to the County courthouse and soon after, the Los Angeles No. 1 Station was completed and the company was providing service to residential areas. On

December 1, 1897, West Side Lighting Company had merged with Los Angeles Edison Electric Company to form Edison Electric Company of Los Angeles. The new company immediately set to work to install an underground conduit system to provide service between their Los Angeles No. 2 substation and downtown Los Angeles (Myers 1983:37). This was the first Edison-type direct-current underground system to be installed in the Southwestern United States. Continuing to expand the following year; Edison Electric Company purchased the Southern California Power Company, that at the time of purchase, was constructing a power station on the upper reaches of the Santa Ana River.

In February 1899, Edison Electric Company completed the Santa Ana River No. 1 hydroelectric plant and began transmitting 33-kilovolt (kV) to Los Angeles over the 83-mile-long Santa Ana River Line (Myers 1983:38). At that time, it was the highest-voltage, longest-distance transmission line ever built in the U.S. With major sources of electric power assured, the company purchased the systems of existing smaller companies and expanded its customer base in Los Angeles and the surrounding area. Edison Electric Company constructed new hydroelectric plants in the San Bernardino region on Lytle Creek, Santa Ana River, and Mill Creek at the turn of the century. In 1904, they added Los Angeles No. 3, an 8,000 kilowatt steam station near the Los Angeles River, which utilized the newest, highly efficient steam turbine technology (Myers 1983:43).

Between 1902 and 1907, the company built the Kern River hydroelectric plant, which more than doubled the company's generating capacity. Electricity from Kern River No. 1 was delivered to southern California by way of a 118-mile-long, 75-kV transmission line, which at that time was the highest-voltage line in the nation. It was also the first electric line to be carried entirely on steel towers instead of wood poles. The company's accomplishments in the expansion of its facilities and service area during the first decade of the twentieth century led to reincorporation on July 6, 1909 as the Southern California Edison Company (Myers 1983:47). At that time, it served over 600,000 customers throughout Los Angeles, and outward as far east as Redlands and north to Santa Barbara.

Immediately following the reincorporation, the new SCE Company made plans for "a major construction program to upgrade its transmission and generating systems" (Myers 1983:48). The smaller, obsolete steam plants in their system were retired and replaced with larger facilities incorporating the newest steam turbine technology. Construction of the first of these new steam plants, SCE's Long Beach Steam Plant, began in 1910. Three gigantic vertical steam turbines were installed and put into service in 1911–1914, producing a tremendous 47,500 kilowatts of power. Seawater from the Cerritos Channel in Long Beach Harbor provided the system's cooling water. A network of 66-kV steel tower transmission lines connected the plant to SCE's switching station, which then transferred power to Colton, Santa Ana, Santa Monica, and Pasadena (Myers 1983:49).

On May 26, 1917, SCE purchased Henry Huntington's Pacific Light & Power Corporation, including the Big Creek hydroelectric system that had been completed in 1913 at the cost of $12 million. It was able to deliver 60,000 kilowatts (kW) of power to southern California from Powerhouse No. 1 and No. 2 in the Sierra Nevada Mountains. Following the purchase and merger, SCE spent a dozen years (1917–1929) in

construction to expand the Big Creek hydroelectric project, enlarging the first two powerhouses and adding three new ones. Big Creek became the major source of southern California electricity until the 1950s.

Construction of the Hoover Dam and Powerhouse between 1930 and 1936 resulted in a hydroelectric facility that would produce five billion kW-hours of electricity per year for southern California, Arizona, and Nevada. SCE held the contract to provide some of that power to its Southern California customers. However, the 1930s was a difficult time for SCE, as it was for most Americans. Debilitating economic problems during the Great Depression meant a lull in activity and decreased sales of electric power. Heavy flooding in 1938 caused the company to shut down some utilities for several days, and the need to rebuild or abandon others (Myers 1983:174–175).

During WWII, electric power demand increased 94 percent to meet the needs of southern California's highly developed industries, such as aircraft plants, shipyards, steel industries, oil refineries, tire plants, automobile factories, ordnance works, and numerous military bases (Myers 1983:193). With electric power coming from the Big Creek system, Hoover Dam, and its other plants, SCE had sufficient electric power capabilities to furnish the needs of the war effort if it operated at full capacity. However, wartime power demand soon absorbed the reserve margin, and the capacity of many of their existing facilities was increased by adding new power generating units.

Amidst a population explosion and development boom in southern California that immediately followed the end of WWII, SCE had to increase capacity to keep up with the new wave of demand. The industries that had settled in the region during the war continued to prosper. Military men who had been stationed or trained in California during the war were now returning with their families and friends. Housing and commercial development spread over the region to fill the needs of the post-war newcomers. On April 12, 1951, SCE placed its one millionth meter into service (Myers 1983:200). The post-war boom lasted through the 1970s. Between 1951 and 1964, another one million customers were added, and in 1978, the total was 3 million customers. The only way the company could keep up with the demand was to undertake an enormous expansion of its generating capacity with construction of new steam plants and additions to existing hydro plants.

Over a period of 27 years between 1946 and 1973, ten new oil and natural gas fired electric power plants were built in southern California by SCE and another utility, California Electric Power Company (Calectric), who merged with SCE in 1964 (Myers 1983:205–208). One of the first steam plants constructed as part of this substantial expansion program was the Redondo Steam Station designed and built between 1946 and 1948 as an indoor facility based on the standards of the pre-WWII era. Over the next few years, SCE transitioned the design of their plants to a semi-outdoor and fully outdoor design, which became the standard during the company's expansion period between 1950 and 1973 (JRP 2013:9). As a result of the post-WWII era construction program, SCE was able to increase their generating capacity from 1.2 million kW in 1945, to 15.5 million kW in 1983.

In 1980, SCE was the first electric utility company to make a large-scale commitment to the development of renewable and alternative energy sources such as wind power,

geothermal, solar, fuel cells, cogeneration and hydroelectric generation (Edison International 2013). Throughout the 1990s, SCE expanded their international presence with power generation facilities in the United Kingdom, Australia, Indonesia, Italy, Turkey, the Philippines, and Thailand. By 1996, Edison International was formed as a parent company of SCE to reflect the movement toward a global utility company.

Post-War (WWII) Electric Power Generation in Southern California

After WWII, steam-generated electricity underwent a significant expansion. Beginning in 1948, with the construction of Redondo Beach Steam Station, and over the ensuing several decades, ten new multiple unit oil and gas-fired power plants came on line at coastal and inland sites in Southern California. Seven of these were Edison projects and three were Calectric projects. (Myers 1983:208–209.) Calectric's system merged with Edison's on January 1, 1964 (Myers 1983:205).

The demand for electricity to power the new and abundant electrical appliances that appeared on the market after WWII set utility companies in a scurry to meet capacity. As explained by Hirsh (2002), "(u)sage jumped 14% between 1946 and 1947, but power firms could not get enough equipment to meet demand as labor troubles at manufacturers and reconversion to a peace-time economy stalled deliveries." Between 1947 and 1973, usage rates grew approximately 8 percent per year nationally.

SCE expanded and built many plants in the post-war years to accommodate the demand for electricity. The following plants were built in rapid-fire succession in Southern California: Etiwanda (1951), Redondo Beach Plant No. 2 (1952), El Segundo (1955), and Alamitos (1955). The first outdoor plant, the Highgrove Generating Station in Grand Terrace, was constructed between 1951 and 1955. New units were added to all of these plants in the ensuing years into the mid-1960s. (JRP 2013:9.)

The new units constructed in the 1950s and 1960s were very similar to each other in design (JRP 2013:9). They evidence the transition from indoor steam generating plants, with the components housed in architectural shells, to largely outdoor facilities generally lacking architectural merit or pretense. This is particularly evident at El Segundo, Etiwanda, Alamitos, and Huntington Beach generating stations. This pattern is less evident at Redondo, where the original 1948 Plant 1, housed in an architectural shell in a defined style (Art Moderne) based on pre-WWII standards, transitions to the later Plants 2 and 3 with less architectural embellishment and more open construction (Smallwood 2014).

Alamitos Generating Station

The Alamitos Generating Station (AGS) is a natural gas fired steam-electric generating facility that was constructed by SCE between 1955 and 1969. The facility occupies approximately 120 acres along the west bank of the channelized San Gabriel River, two miles northeast of Alamitos Bay and the Long Beach Marina. The facility operates on the once-through cooling process using water diverted from Los Cerritos Channel to the west of the facility. The cooling water runs through the plant and is then discharged into the San Gabriel River on the east.

AGS was built during a period of new steam-power generation facility expansion across California to meet increased post-WWII demand for electricity. The first unit (Unit 1) at AGS began commercial operation in September 1956 and Unit 2 went online in February 1957, both as 175-megawatt (MW) units with a Babcock and Wilcox natural circulation boiler. They were followed by Unit 3, which was installed in December 1961, and Unit 4 in June 1962; both were 320-MW with a controlled circulation boiler. Units 5 and 6, both 480-MW units with a supercritical boiler, were added in 1966—Unit 5 in March and Unit 6 in September. Unit 7 was installed in July 1969 with a combustion turbine and operating capacity of 140 MW. The first six units operated in pairs with Unit 7 serving as a supplemental peak-unit to provide additional power during periods of high usage. All seven units are considered outdoor plants as they are constructed free-standing without a covering structure or building.

The AGS was designed as dual-source, meaning that it could be powered either by oil or natural gas, and once had four large fuel-oil tanks on the premises. In the 1970s, all dual-source fueled plants were required to convert to natural gas only, and by the 1980s, the AGS had completed the conversion. AES-Southland Development acquired the AGS plant from SCE on May 18, 1998. Unit 7 was decommissioned in 2003, and the fuel oil tanks were removed in 2010.

Los Angeles Basin Drainage and Flood Control

The Los Angeles Basin is dissected by the Los Angeles and San Gabriel rivers as they make their way to the Pacific Ocean, and historically, these rivers flowed freely across the landscape along a natural course that meandered and flooded at will. Devastating floods from winter and spring rainstorms wreaked havoc along the San Gabriel River in the late nineteenth century and the early years of the twentieth century as the population and growth of Los Angeles was beginning to soar. According to the United States Geological Survey heavy flooding occurred on both the Los Angeles and San Gabriel rivers in 1825, 1833, 1842, 1852, 1862, 1867, 1874, 1884, 1886, 1889, 1890, 1909, 1911, 1914, and 1916 (McGlashan and Ebert 1918:40). Their report indicates that the United States Weather Bureau recorded 41 floods in the vicinity of Los Angeles during the period 1878 to 1914.

The most famous of these flooding episodes was the Great Flood of 1861–1862. From December 1861 through January 1862, a series of storms slammed the Pacific Coast from Mexico to Canada, producing the most violent flooding Southern California residents have experienced in history. It rained for almost four weeks producing as much as 66 inches of rain-fall in Los Angeles that year—more than four times the normal annual amount (Ingram 2012:1). Rivers flooded, spreading muddy water for several miles across the landscape. Large brown lakes formed on the normally dry plains of the Los Angeles Basin and covered vast areas of the Mojave Desert and the San Joaquin Valley, the latter of which became “an inland sea 250 to 300 miles long and 20 to 60 miles wide” (Cleland 1941:127). Flooding of the Santa Ana River created a large lake in the Anaheim area that measured four feet deep, stretching as much as four miles wide (Ingram 2012:1). The flooding drowned hundreds of thousands of cattle throughout the State and swept away entire communities and mining settlements statewide. Orchards and farmland washed away, leaving much of the agricultural

development on the plains of Los Angeles County in ruins. Small settlements in the Los Angeles Basin were completely submerged and destroyed.

A disastrous flood that occurred in February 1914, which caused over $10 million in property damage in Los Angeles County, prompted the creation of the Los Angeles County Flood Control District (LADPW 2014). Successful bond issues in 1917 and 1924 financed construction of dams and other structures to impound San Gabriel River water and slow its flow in a controlled manner.

San Gabriel River

Development booms in the Los Angeles area during the early twentieth century, especially once the Los Angeles Aqueduct was activated in 1913, resulted in an outward expansion and growth of the region toward the Los Angeles Basin, which had previously been used for agriculture and ranching. In an effort to thwart the devastation that periodic rainstorms and flooding could cause, the Los Angeles County Flood Control District proposed impounding the San Gabriel River in an attempt to provide flood control. The project would also recharge groundwater flows and produce hydroelectricity for the San Gabriel Valley and Los Angeles metropolitan areas. Portions of the project were authorized and constructed by the U.S. Army Corps of Engineers with federal funding. Construction of the first dam on the San Gabriel River began in 1929, but engineering flaws in its design and the onset of the Great Depression postponed the project until 1932 (Rogers 2007:82).

Within the decades spanning the 1930s–1950s, five dams were constructed on the San Gabriel River. Extending from the upstream segment of the San Gabriel River in the San Gabriel Mountains to downstream, these are: Cogswell Dam (1932–1934), San Gabriel Dam (1932–1939), Morris Dam (1932–1934), Santa Fe Dam (1941–1949), and Whittier Narrows Dam (1949–1957) (LADPW 2006:2-28–2-30).

Before these dams could be completed, two record storms hit the Los Angeles region during the 1930s, flooding the San Gabriel River. The first flood occurred the night of December 31, 1933, causing the deaths of nearly 100 people, and the loss of 200 homes and 800 automobiles (SEMP 2006). It destroyed whole neighborhoods in the La Crescenta/Montrose areas due to landslides from the neighboring foothill mountains, which had recently burned. The event was so devastating that it inspired singer/songwriter Woodie Guthrie to write a song about it, titled “Los Angeles New Year’s Flood”:

Oh, my friends, do you remember?
On that fatal New Year’s night
The lights of old Los Angeles
Were a flick’ring, Oh, so bright.
A cloud burst hit our city
And it swept away our homes;
It swept away our loved ones
In that fatal New Years flood.

No, you could not see it coming
Till through our town it rolled;
One hundred souls were taken
In that fatal New Years flood.

Our highways were blockaded
Our bridges all washed down,
Our houses wrecked and scattered
As the flood came a-rumblin’ down;
I bow my head in silence
And I thank my God above
That He did not take my home from me

In that fatal New Years flood. Whilst we all celebrated That happy New Year's Eve, We knew not in the morning This whole wide world would grieve; The waters filled our canyons And down our mountains rolled; That sad news rocked our nation As of this flood it told.	In that fatal New Year's flood. No, you could not see it coming Till through our town it rolled; One hundred souls were taken In that fatal New Years flood.

In March of 1938, a pair of Pacific rainstorms caused abnormally high amounts of rainfall in the San Gabriel Mountains and across Southern California, causing the San Gabriel, Los Angeles, and Santa Ana Rivers to burst their banks. The 1938 flood event resulted in the deaths of 115 people, and it destroyed 5,601 homes (SEMP 2006). It damaged 1,500 additional homes leaving them uninhabitable. Both storm debris and mud flows buried people in their homes or drowned them as they attempted to escape. If not for the reservoirs and a portion of the San Gabriel Dam that had been completed in 1938, the damage to the residents of the Los Angeles Basin could have been much worse than it was (SEMP 2006).

In addition to the construction of dams on the San Gabriel River, the U.S. Army Corps of Engineers channelized the entire 34-mile length of the river below the mountains to the Pacific Ocean during stages between about 1928 and the mid-1950s. Its channelized course parallels the I-605 freeway its entire length from Azusa to Alamitos. From the mouth of Azusa Canyon at the southern edge of the San Gabriel Mountains, the river cascades over a series of more than 16 drop structures to slow the flow of flood waters from the mountains before it reaches the Santa Fe Dam. A series of 19 drop structures are positioned along the channel between Santa Fe Dam and Whittier Narrows Dam, within a 400-feet-wide earthen channel with concrete sides. Downstream of Whittier Narrows Dam, the channel narrows from 390 feet wide to 320 feet wide. Upon nearing Firestone Boulevard in Downey, the earthen channel narrows into a 165 feet wide concrete-bottom channel. The concrete bottom channel continues south and merges with Coyote Creek Channel at Rossmoor, at which point their convergence drops into a 350 feet wide earthen channel bordered by earthen dikes lined with rip-rap. This style of construction continues along the balance of the river's course to the Pacific Ocean at Alamitos Bay.

Los Cerritos Channel

Based on historic aerial photographs, it appears that Los Cerritos Channel was built in the 1940s in an effort to control flows in that part of the Los Angeles Basin prior to the area being built over with dense residential and commercial development (EDR 2011). The Los Cerritos Channel is fed by the convergence of several small channelized tributaries that flow from their emergence in the nearby communities of Bellflower, Lakewood, and Bixby Knolls to the north and northwest of Los Alamitos. Each tributary measures less than 80 feet wide and 4 miles in length. Once they convene, their flow enters a segment of Los Cerritos Channel that is a 120-feet wide concrete channel. At Atherton Street, the concrete channel drops into a 200-foot wide segment of Los

Cerritos Channel that is earthen and lined with rip-rap boulders. From there, the water is delivered 2.5 miles to the Pacific Ocean at Alamitos Bay. The two intake channels extending from Los Cerritos Channel into the Alamitos Generating Station were built during the late 1950s, at the same time as the power plant it serves (Price 2014:2)

PROJECT AREA OF ANALYSIS

Appendix CR-1 Table 1 below defines the applicant's proposed depths of excavation, depths of existing fill (artificial) deposits, and depths of excavation into natural soils or sediments, for each component of the proposed AEC. This information establishes the vertical dimension of staff's project area of analysis (PAA) in the PSA. Acronyms used in **Appendix CR-1 Table 1** are spelled out at the bottom of the table.

Appendix CR-1 Table 1
Depths of Major Excavations for the Proposed Project

Project Element	Proposed Excavation Depth (feet bg)	Depth of Existing Fill (feet bg)	Depth of Excavation into Natural Soils or Sediments (feet bg)	References
Power Block 1				
CTGs (N = 2)	Concrete pad: ≤10 Piles: ~ 50	Estimated 6–9	Concrete pad: 1–4 Piles: 41–44	AES 2015a:1-2, 5.3-24–5.3-25
HRSGs (N = 2)	Concrete pad: ≤10 Piles: ~ 50	Estimated 6–9	Concrete pad: 1–4 Piles: 41–44	AES 2015a:1-2, 5.3-24–5.3-25
STG	Concrete pad: ≤10 Piles: ~ 50	Estimated 6–9	Concrete pad: 1–4 Piles: 41–44	AES 2015a:1-2, 5.3-24–5.3-25
ACC	Piles: 50	Estimated 6–9	Piles: 41–44	AES 2015a:1-2, 5.3-25
Auxiliary boiler	Concrete pad: ≤10 Piles: ~ 50	Estimated 6–9	Concrete pad: 1–4 Piles: 41–44	AES 2015a:1-2, 5.3-24–5.3-25
Fin-fan cooler	Piles: 50	8	42	AES 2015a:2-3, 5.3-24–5.3-25
GSU transformers (N = 3)	Concrete pad: ≤10 Piles: ~ 50	Estimated 6–9	Concrete pad: 1–4 Piles: 41–44	AES 2015a:2-9, 2-11, 5.3-24–5.3-25; AES 2015b:4
Fire water and suppression systems, hydrants	~ 10	Estimated 6–9	1–4	AES 2015a:2-4, 2-17, 5.3-2, 5.3-24
Water treatment and storage systems	≤ 10	Estimated 6–9	1–4	AES 2015a:2-4, 5.3-24
Metal acoustical enclosure	≤ 10	Estimated 6–9	1–4	AES 2015a:2-7–2-9, 5.3-24
Ammonia tank deep piles, containment, and injection grid	Piles: 50	Estimated 6–9	Piles: 41–44	AES 2015a:2-14–2-15, 5.3-25; AES 2015b:5
Ammonia refilling station, containment basin, and sump	≤ 10	Estimated 6–9	1–4	AES 2015a:2-15, 5.3-24

Project Element	Proposed Excavation Depth (feet bg)	Depth of Existing Fill (feet bg)	Depth of Excavation into Natural Soils or Sediments (feet bg)	References
Related ancillary equipment	≤ 10	Estimated 6–9	1–4	AES 2015a:1-2, 5.3-24
Power Block 2				
CTGs (N = 4)	Concrete pad: ≤10 Piles: ~ 50	8	Concrete pad: 2 Piles: 42	AES 2015a:1-2, 5.3-24–5.3-25
CTG inlet air filter house with evaporative cooler (N = 4)	Concrete pad: ≤10 Piles: ~ 50	8	Concrete pad: 2 Piles: 42	AES 2015a:2-3, 5.3-24–5.3-25
CTG turbine intercooler and intercooler circulating pumps (N = 4)	Concrete pad: ≤10 Piles: ~ 50	8	Concrete pad: 2 Piles: 42	AES 2015a:2-3, 5.3-24–5.3-25
Fin-fan coolers (N = 2)	Piles: ~ 50	8	42	AES 2015a:1-2, 2-6, 5.3-25
GSU transformer (N = 2)	Concrete pad: ≤10 Piles: ~ 50	8	Concrete pad: 2 Piles: 42	AES 2015a:2-3, 2-9, 2-11; AES 2015b:4
Fire water and suppression systems	~ 10	8	2	AES 2015a:2-4, 5.3-2
Water treatment and storage systems	≤ 10	8	2	AES 2015a:2-4, 5.3-24
Ammonia tank deep piles, containment, and injection grid	Piles: 50	8	Piles: 42	AES 2015a:2-14–2-15; AES 2015b:5
Ammonia refilling station, containment basin, and sump	≤ 10	8	2	AES 2015a:2-15, 5.3-24
Ancillary facilities	≤ 10	8	2	AES 2015a:1-2, 5.3-24
Other Project Components				
Natural gas metering facility	≤ 10	8	≤ 2	AES 2015a:1-3, 2-4, 5.3-24
Natural gas compressor buildings (N = 2)	≤ 10	8	≤ 2	AES 2015a:1-3, 2-3, 2-4, 5.3-24; AES 2015b:4
Gas scrubber/filtering equipment	≤ 10	8	≤ 2	AES 2015a:2-4, 5.3-24, Figure 2.1-2; AES 2015b:4
Construction laydown areas	Estimated < 6	6–9	0	AES 2015a:1-3, Figure 1.1-3
New process/sanitary wastewater pipeline (6-inch diameter)	10–15 (10-ft-wide construction corridor)	Unknown	Unknown	AES 2015a:1-3, 2-5, 5.3-2
Oil/water separators and sumps (N = 2)	≤ 10	6–9	1–4	AES 2015a:2-2, 5.3-24
600,000-gal onsite fire/service water storage tank	Piles: 50	6–9	41–44	AES 2015a:2-5, 5.3-24–25; AES 2015b:4

Project Element	Proposed Excavation Depth (feet bg)	Depth of Existing Fill (feet bg)	Depth of Excavation into Natural Soils or Sediments (feet bg)	References
Station battery system (in Administrative building)		6–9		AES 2015a:2-9, 5.3-24; AES 2015b:4
Construction/commissioning electrical connection to existing 66-kV power source (includes underground conduit)	10	6–9	1–4	AES 2015a:2-10, 5.3-24; AES 2015b:4
340,000-gal deionized water tank	Piles: 50	6–9	41–44	AES 2015a:2-12, 5.3-24–5.3-25; AES 2015b:4–5
System of floor drains, hub drains, sumps, and piping	~ 10	6–9	1–4	AES 2015a:2-16, 5.3-2
Wastewater holding tanks or sumps	10	6–9	1–4	AES 2015a:2-16, 5.3-24; AES 2015b:5
OHTL poles, 6-ft-diameter (N = 3)	18	6–8	10–12	AES 2015a:3-1, Appendix 5.15A
A-frame transmission structures, four 2-ft-diameter footings each (N = 2)	8	6–8	10–12	AES 2015a: Appendix 5.15A
Condensate receiver, storage tank, pumps, and transfer pumps	Piles: 50	6–9	41–44	AES 2015a:2-14, 5.3-24–5.3-25, Figure 2.1-2; AES 2015b:5
Station grounding grid	2–3	Power Block 1: 6–9 Power Block 2: 8	Power Block 1: 0 Power Block 2: 0	AES 2015a:5.3-24; AES 2015b:5
Demolition of AGS Unit 7's Remaining Components				
Demolition	≤ 10	6–9	1–4	AES 2015a:1-3, 2-2, 5.3-3, 5.3-24; AES 2015b:3
Other Demolition Activities				
Demolish two wastewater retention basins	≤ 10	8	≤ 2	AES 2015a:1-3, 5.3-3, 5.3-24
Notes: ACC = air-cooled condenser; AGS = Alamitos Generating Station; bg = below grade; CTG = combustion turbine generator; ft = feet; gal = gallon(s); GSU = generator step-up; HRSG = heat recovery steam generator; kV = kilovolt(s); OHTL = overhead transmission line; STG = steam turbine generator. Staff estimated the depth of existing fill from AES (2015a:5.3-24) and Ninyo & Moore (2011: Figure 3, Appendix A).				

BACKGROUND RESEARCH

As stated in the PSA, the literature review and records search indicate that 80 previous cultural resource studies have been conducted in the PAA. Of these, 11 cultural resource studies have been conducted within or adjacent to the archaeological and historic built environment portion of the PAA and 80 in the ethnographic portion of the PAA (**Appendix CR-1 Tables 2–3**).

APPENDIX CR-1 TABLE 2
Literature Review Results within or adjacent to the Archaeological Resources and Built Environment Portions of the PAA

Author and Date of Study	SCCIC Study Number	Resources Identified
Strudwick et al. 1996	LA-1996	None
McKenna 1990a	LA-2114	P-19-001821
McKenna 2001	LA-5215	P-19-000234, P-19-000235, P-19-000306
Zahniser 1974	LA-4269/LA-5315	P-19-000306
Billat 2003	LA-6909	None
Strudwick 2004	LA-8487	P-19-186880
CLB, with Rincon 2010	None	None
Cardenas et al. 2012	Not assigned	None
Stickel 1991	OR-1272	P-30-000143, P-30-000256, P-30-000257, P-30-000258, P-30-000259, P-30-000261, P-30-000262, P-30-000263, P-30-000264, P-30-000298, P-30-000322, P-30-000850, P-30-000851, P-30-000852, P-30-001118
Davy 1997a	OR-1931	P-19-000272, P-19-001821, P-30-000143, P-30-000256, P-30-000257, P-30-000258, P-30-000259, P-30-000260, P-30-000261, P-30-000262, P-30-000263, P-30-000264, P-30-000298, P-30-000322, P-30-000850, P-30-000851, P-30-000852, P-30-001118, P-30-001455

APPENDIX CR-1 TABLE 3
Literature Review Results: Studies in the Ethnographic PAA

Author and Date of Study	SCCIC Study Number
Strudwick et al. 1996	LA-1996
McKenna 1990a	LA-2114
McKenna 2001	LA-5215
Zahniser 1974	LA-4269/LA-5315
Billat 2003	LA-6909
Strudwick 2004	LA-8487
Cardenas et al. 2012	Not assigned
Stickel 1991	OR-1272
Davy 1997a	OR-1931
Cooley 1979	LA-00522
Dixon 1974a	LA-00503
Leonard 1974	LA-00057
Allen 1980	LA-00939
Van Horn and Brock 1981	LA-00987
Weinman and Stickel 1978	LA-2399/OR-403

Author and Date of Study	SCCIC Study Number
Dixon and Rosenthal 1981	LA-2792
Desautels 1981; Dixon 1982	LA-2793
Dixon 1972	LA-2794
Desautels et al. 1979	LA-2795
Dixon 1993	LA-2864
York et al. 2003	OR-3391
Bucknam 1974	LA-3583
Milliken at al. 1997	LA-4091
McLean et al. 1997	LA-4157
Underwood 1993a	LA-4270
Underwood 1993b	LA-4274
Underwood 1993c	LA-4275
Underwood 1993d	LA-4276
Underwood 1993e	LA-4277
Widell 1994	LA-4355
Cottrell 1975a	LA-5727
Shepard 2003	LA-6107/OR-2774
Altschul 1994	LA-6160
Cottrell 1975b	LA-6163
Shepard 2004	LA-8494
URS 2003	LA-8495
Shepard et al. 2004	Not found in SCCIC bibliography
Raab and Boxt 1993	LA-8497
Raab and Boxt 1994	LA-8498
MBA 2006	LA-9839
Wills 2006	LA-9840
Fulton 2009	LA-10483
Archaeological Associates 1980	OR-00493
SRS 1981	OR-639
Redwine 1958	OR-01049
Clevenger et al. 1993	OR-1599
Clevenger and Crawford 1997a	OR-1897
Clevenger and Crawford 1995	OR-1958
Mason and Cerreto 1995	OR-1960
Clevenger and Crawford 1997b	OR-1969
Berryman and Pettus 1995	OR-1989
Mason 1987	OR-2033
Romani 1981	OR-2161
Duke 2000	OR-2164
Ogden 1995	OR-3174
JRP 1999	OR-3175
Ritchie 2000	OR-3371
Wlodarski 2006	OR-3402
Ehringer 2009	OR-3762
Cleland et al. 2007	OR-3828
Mason 2009a, 2009b	OR-3870
Slauson 2009	OR-3890
USACE 1978	LA-10527
Whitney-Desautels and Bonner 1994	LA-3114
Stickel 1996a	OR-1608

Author and Date of Study	SCCIC Study Number
York et al. 1997a	OR-1643
York et al. 1997b	OR-1644/1858
Stickel 1996b	OR-1610
Stickel 1996c	OR-1816
Bates 1972	LA-294
Drover 1993	LA-2870
SRS 1980	LA-263
Whitney-Desautels et al. 1986	LA-1541
Whitney-Desautels 1979	LA-561
Cameron 1973	LA-87
Whitney-Desautels et al. 1993	LA-3303
Carter and Neitzel 1977	LA-4364
EDAW 2003, cited in LADWP, with AECOM 2010:4.2-4	None
Anonymous 2001, cited in LADWP, with AECOM 2010:4.2-4	None
LSA 2009	None (associated with Fulton 2009)
CLB 2009a	None
DON 2013	None; associated with JRP 1999
Parsons 2014	None

APPENDIX CR-1 TABLE 4
Literature Review Results: Previously Recorded Cultural Resources

Resource Designation	Type	Description	Location	Significance	Source
Archaeological Resources					
P-19-000102 (CA-LAN-102)	Prehistoric archaeological site	Shell midden, debitage, pestle, mano, projectile point	Records search area	Recorded 1966, destroyed by construction, fall of 1973	SCCIC 2006; Stevens 1966
P-19-000231	Prehistoric archaeological site	Midden, shell	Records search area	Recorded 1961	
P-19-000232	Prehistoric archaeological site	Midden, shell	Records search area	Unevaluated	Dixon 1961a
P-19-000233	Prehistoric archaeological site	Shell midden, lithic debitage	Records search area	Unevaluated	Dixon 1961b
P-19-000234 (CA-LAN-234/H)	Prehistoric and historic	Shell, lithic debitage, human remains	Records search area	NRHP/CRHR listed	Dixon 1960a, 1973; Leonard 1974; Mellon 1981; Noguchi and Wilson 1979; Sutherland 1981
P-19-000235 (CA-LAN-235/H)	Prehistoric and historic	Human remains, shell, lithic debitage	Records search area	NRHP/CRHR listed	Dixon 1960b, 1973; Noguchi and Wilson 1979
P-19-000236	Prehistoric and		Records search		

Resource Designation	Type	Description	Location	Significance	Source
(CA-LAN-236/H)	historic archaeological site		area		
P-19-000270 (CA-LAN-270)	Prehistoric archaeological site	Human remains, projectile points, knives, mortars, pestles, steatite bowls, charmstones, pigments, bone tools and ornaments, shell ornament, shell ornaments, desert pottery	Records search area		Bates 1972; Dixon 1960c
P-19-000271 (CA-LAN-271)	Prehistoric archaeological site	Shell midden, hammerstone, debitage	Records search area	Unevaluated	Dixon 1959
P-19-000272 (CA-LAN-272)	Prehistoric human remains	Deeply buried human skull	Records search area	Unevaluated	Brooks et al. 1965
P-19-000273 (CA-LAN-273)	Prehistoric archaeological site	Midden, shell, bowl rim, chopper, lithic debitage	Records search area	Unevaluated	Dixon 1961c
P-19-000274 (CA-LAN-274)	Prehistoric archaeological site	Shell fragments	Records search area	Unevaluated	Dixon 1961d
P-19-000275 (CA-LAN-275)	Prehistoric archaeological site	Shell fragments	Records search area	Unevaluated	Dixon 1961e
P-19-000278 (CA-LAN-278)	Prehistoric archaeological site	Campsite or village; midden, debitage	Records search area		True 1960
P-19-000306 (CA-LAN-306)	Prehistoric archaeological site	Puvunga Indian Village: midden, shell, manos, pestles, metate fragments, steatite bowls, bifaces, projectile points, debitage, shell ornaments, asphaltum, stone disc and shell beads	Records search area	NRHP/CRHR listed	Dixon 1964, 1973; Milliken et al. 1997; Noguchi and Wilson 1979

Resource Designation	Type	Description	Location	Significance	Source
P-19-000702 (CA-LAN-702)	Prehistoric archaeological site	Midden, shell, mano fragments, debitage, fish bones, human remains	Records search area	Significant, regulatory criteria unspecified	Allen 1980; Clutter and Howard 1974; Cottrell 1975a, 1975b
P-19-000703 (CA-LAN-703/704), The Park Estates Site	Prehistoric archaeological site	Shell fragments, midden, lithic debitage, projectile point, clam shell	Records search area		Boxt 1994a; Dixon 1974b, 1974c
P-19-000705 (CA-LAN-705/H), The CSULB Isabel Patterson Child Development Center Site	Prehistoric/historic archaeological site, including buried prehistoric deposits to north and east	Shell fragments, midden, lithic debitage, shell beads, pestle, steatite bowl fragment, used shell, terrestrial and marine faunal remains, ceramics, glass	Records search area	Recommended as significant (regulatory criteria not specified)	Boxt 1993; Dixon 1974d
P-19-001000 (CA-LAN-1000), The CSULB Swimming Pool Site	Prehistoric archaeological site	Buried midden, shell fragments	Records search area	Recommended as significant (regulatory criteria not specified)	Boxt 1994b; Dixon 1979a; Underwood 1993b
P-19-001001 (CA-LAN-1001)	Prehistoric archaeological site	Midden, shell fragments; later study found nothing	Records search area	Unevaluated; no evidence found in 1996	Boxt 1996; Dixon 1979b
P-19-001002 (CA-LAN-1002)	Prehistoric archaeological site	Midden, shell fragments, FAR, CCS flake, CCS biface	Records search area	Unevaluated	Dixon 1979c; Underwood 1993e
P-19-001003 (CA-LAN-1003)	Prehistoric archaeological site	Midden, shell fragments, debitage	Records search area	Unevaluated; no evidence found in 1994	Boxt 1994c; Dixon 1979d
P-19-001004 (CA-LAN-1004)	Prehistoric archaeological site	Midden, shell fragments	Records search area	Unevaluated; reportedly a redeposit	Boxt 1994d; Dixon 1979e
P-19-001005 (CA-LAN-1005)	Prehistoric archaeological site	Midden, shell fragments	Records search area	Unevaluated; no evidence found in 1994	Boxt 1994e; Dixon 1979f; Underwood 1993b
P-19-001006 (CA-LAN-1006)	Prehistoric archaeological site	Shell midden	Records search area	Appears to have been destroyed by 1994	Dixon 1979g; Whitney-Desautels and Bonner 1994
P-19-001007	Prehistoric	Shell midden,	Records search	Much of the	Dixon 1979h

Resource Designation	Type	Description	Location	Significance	Source
(CA-LAN-1007)	archaeological site	debitage, bone, possible human bone	area	site destroyed in 1979	
P-19-001821 (McKenna 1)	Prehistoric archaeological site	Shell midden	Records search area	Unevaluated	McKenna 1990a, 1990b
P-19-002616 (CA-LAN-2616), The CSULB Vivian Engineering Quadrangle Site, Midden Trace D	Prehistoric archaeological site	Shell midden, metates, terrestrial and fish bone, manos, shell beads, scrapers, projectile points, CCS and obsidian debitage, buried midden	Records search area	Recommended as significant (regulatory criteria not specified)	Boxt 1997; Langenwalter et al. 2001
P-19-002629 (Trace F – second location/Midden Trace F/The CSULB Los Cerritos Hall Site)	Prehistoric archaeological site	Buried midden, schist bead, projectile point, scrapers, spokeshave, debitage (chert, steatite, chalcedony), mano fragment, 12 FAR, mollusk remains, faunal remains	Records search area	Undetermined	Boxt 1994f; CSULB 1977a
P-19-002630 (The CSULB Parking Structure Site/Midden Trace G and Temporary Site Nos. 1–4); subsumes P-19-120044 and P-19-120052	Prehistoric/historic archaeological site	Buried midden, shell beads, Tizon Brownware, bone awls, projectile points, cores, debitage, scraping tools, faunal bones, shell debris, obsidian and steatite, drills, hammerstones, bone tools, human tooth; historic faunal remains, burnt vegetable remains, a glass bead,	Records search area	Recommended as significant (regulatory criteria not specified)	Boxt 1994g; CSULB 1977b, 1977c

Resource Designation	Type	Description	Location	Significance	Source
		birdshot, bottle glass, button, pottery			
P-19-100485	Prehistoric archaeological site	Shell bead scatter	Records search area		Mason 2009a:Table 1
P-19-120038 (Trace A)	Prehistoric archaeological site	Midden	Records search area	Unevaluated	CSULB 1977d
P-19-120039 (Trace B)	Prehistoric archaeological site	Redeposited or disturbed shell scatter	Records search area	Unevaluated	CSULB 1977e
P-19-120040 (Trace C)	Prehistoric archaeological site	Midden	Records search area	Unevaluated	CSULB 1977f; Underwood 1993b
P-19-120041 (Trace D)	Prehistoric archaeological site	Midden	Records search area	Unevaluated	CSULB 1977g; Underwood 1993b
P-19-120042 (Trace E)	Prehistoric archaeological site	Midden	Records search area	Unevaluated	CSULB 1977h
P-19-120043 (Trace F)	Prehistoric archaeological site	Midden	Records search area	Unevaluated	CSULB 1977i
P-19-120045 (Trace H)	Prehistoric archaeological site	Redeposited or disturbed shell scatter	Records search area	Unevaluated	CSULB 1977j; Mason 2009a:Table 1
P-19-120046 (Trace I)	Prehistoric archaeological site	Midden	Records search area	Unevaluated	CSULB 1977k
P-19-120047 (Trace J)	Prehistoric archaeological site	Midden	Records search area	Unevaluated	CSULB 1977l
P-19-120048 (Trace K)	Prehistoric archaeological site	Redeposited or disturbed shell scatter	Records search area	Unevaluated	CSULB 1977m; Mason 2009a:Table 1; Underwood 1993b
P-19-120049 (Trace L)	Prehistoric archaeological site	Redeposited or disturbed shell scatter	Records search area	Unevaluated	CSULB 1977n; Mason 2009a:Table 1; Underwood 1993b
P-19-120050 (Trace B – second location)	Prehistoric archaeological site	Redeposited or disturbed shell scatter	Records search area	Unevaluated	CSULB 1977o; Mason 2009a:Table 1
P-19-120053 (Trace J – second location)	Prehistoric archaeological site	Midden	Records search area	Unevaluated	CSULB 1977p
P-19-120062	Prehistoric archaeological site	Shell midden, stone artifacts; probably	Records search area	Unevaluated	URS 2003

Resource Designation	Type	Description	Location	Significance	Source
		redeposited			
P-30-000143 (CA-ORA-143)/P-30-000265 (CA-ORA-265), Landing Hill #10	Prehistoric archaeological site/historic ranch house and structures (the latter not formally recorded)	Shell midden, burials, steatite bowl fragments, hammerstone, bone, scrapers, siltstone charmstone, fossil bone, rubbing stones, obsidian and CCS debitage, shell bead, effigy, points, manos, pestles, drills, bowl mortars, metates, maul, shell; buildings and structures	Records search area	Destroyed in 1960s	Brotman 1965a, 1965b; Davy 1997b; McKinney 1964, 1969a; Redwine 1958; Singer 1965
P-30-000256 (CA-ORA-256), Landing Hill #1	Prehistoric archaeological site	Midden, shell,	Records search area	Destroyed about 1958	McKinney 1969b; Redwine 1958; SRS 1981; Stickel 1996b, 1996d
P-30-000257 (CA-ORA-256), Landing Hill #2	Prehistoric archaeological site	Two manos, two metate fragments, two pieces of worked stone	Records search area	Destroyed about 1958	McKinney 1969c; Redwine 1958; SRS 1981; Stickel 1996b, 1996e
P-30-000258 (CA-ORA-258), Landing Hill #3	Prehistoric archaeological site	Possible hearth, shell, metates, manos, hammerstones, mortars, pestles, polishing stones, projectile points, grooved axe	Records search area	Destroyed about 1958	PCAS 1969; Redwine 1958; SRS 1981; Stickel 1996b, 1996f
P-30-000259 (CA-ORA-259), Landing Hill #4	Prehistoric archaeological site	Shell midden, metates, manos, mortars, hammerstone, polishing stone,	Records search area	Unevaluated	McKinney 1969d; Redwine 1958; Stickel 1996b, 1996g

Resource Designation	Type	Description	Location	Significance	Source
		projectile point, blade, chert debitage, worked stone, faunal bone			
P-30-000260 (CA-ORA-260), Landing Hill #11	Prehistoric archaeological site, possible ceremonial site	Domestic habitation (Millingstone–Intermediate period occupation), shell, metate, net weight, burnt bone, manos, mortars, stone fragments, ground flakes	Records search area	Significant, regulatory criteria unstated	Cleland et al. 2007; Flaherty and Stickel 1996; McKinney 1969e; Redwine 1958; SRS 1981; Stickel 1996b, 1996h; York et al. 1997a
P-30-000261	Prehistoric archaeological site	Shell midden, metate, human remains; Late Intermediate Period occupation	Records search area	Significant, regulatory criteria unstated	Cleland et al. 2007; SRS 1981; York et al. 1997a
P-30-000262 (CA-ORA-262), Landing Hill #7	Prehistoric archaeological site	Campsite, shell midden, mano, hammerstones, pestle, human remains; Millingstone and Late Prehistoric–Protohistoric occupations	Records search area	Significant, regulatory criteria unstated	Cleland et al. 2007; McKinney 1969f; Redwine 1958; SRS 1981; Stickel 1996b, 1996i; York et al. 1997a
P-30-000263 (CA-ORA-263), Landing Hill #8 and P-30-000852 (CA-ORA-852), Area 5	Prehistoric archaeological site	Shell midden, manos, pestle chopper, bone awl, human burials & cremations; Millingstone and Intermediate period occupations; Late Prehistoric ceremonial use	Records search area	Significant, regulatory criteria unstated	Cleland et al. 2007; Colquehoun n.d.c; McKinney 1969g; Redwine 1958; SRS 1981; Stickel 1996b, 1996j, 1996m; York et al. 1997a
P-30-000264 (CA-ORA-264), Landing	Prehistoric archaeological site	Occupation site with human	Records search area	Significant, regulatory criteria	Cleland et al. 2007; McKinney

Resource Designation	Type	Description	Location	Significance	Source
Hill #9		remains, shell, metates, manos, mortars, pestles, hammerstones, pelican stone, cog stone, medicine tube; Millingstone–Late Prehistoric		unstated	1969h; Redwine 1958; York et al. 1997a
P-30-000298 (CA-ORA-298), Hog Island	Prehistoric archaeological site	Shell scatter, metate	Records search area	Recommended NRHP-eligible (Criterion D)	Clevenger et al. 1993
P-30-000322 (CA-ORA-322) and P-30-001118 (CA-ORA-1118)	Prehistoric archaeological site	Midden, shell midden, shell, bone tool, bone fragments core, CCS debitage, potsherd	Records search area	Recommended NRHP-eligible (Criterion D)	Clevenger and Crawford 1997a; Clevenger et al. 1993
P-30-000850 (CA-ORA-850), Area 3	Prehistoric archaeological site	Shell scatter	Records search area	Not evaluated	Colquehoun n.d.a; Stickel 1996b, 1996k; York et al. 1997a
P-30-000851 (CA-ORA-851), Area 4	Prehistoric archaeological site	Shell scatter, CCS flake or core	Records search area	Not evaluated	Colquehoun n.d.b; Stickel 1996b, 1996l; York et al. 1997a
P-30-001352 (CA-ORA-1352)	Prehistoric archaeological site	Redeposited shell scatter	Records search area	Capped by building	Mason 2009a:Table 1
P-30-001455			Records search area		
P-30-001472 (CA-ORA-1472)	Prehistoric archaeological site	Shell scatter, human remains; Millingstone Period	Records search area	Significant, regulatory criteria unstated	Cleland et al. 2007; York et al. 1997a
P-30-001473, LH #12, Landing Hill Site #12	Prehistoric archaeological site	Shell midden	Records search area	Not evaluated	Stickel 1996b; York et al. 1997a
P-30-001502 (CA-ORA-1502)	Prehistoric archaeological site	Shell midden, human remains, stone disk, manos, mortars,	Records search area	Recommended eligible for NRHP	Mason 2009a, 2009b

Resource Designation	Type	Description	Location	Significance	Source
		cores, debitage			
P-30-001505	Prehistoric archaeological site	Shell, debitage	Records search area		Mason 2009a:Table 1
P-30-001539, Site B-1	Prehistoric archaeological site	Shell scatter	Records search area	Unevaluated	Underwood 2000a
P-30-001540, Site B-2	Prehistoric archaeological site	Shell midden	Records search area	Unevaluated	Underwood 2000b
P-30-001541, Site B-3	Prehistoric archaeological site	Shell midden	Records search area	Unevaluated	Underwood 2000c
P-30-001542, Site B-4/H	Prehistoric and historic archaeological site	Shell scatter with buried shell component, possible mano; historic glass and ceramic scatter	Records search area	Unevaluated	Underwood 2000d
P-30-001543, Site B-5H	Historic archaeological site	Refuse deposit	Records search area	Unevaluated	Underwood 2000e
P-30-001544, Site B-6	Prehistoric archaeological site	Shell scatter, midden, mano-hammerstone	Records search area	Unevaluated	Underwood 2000f
P-30-001545, Site B-7	Prehistoric archaeological site	Shell scatter	Records search area	Unevaluated	Underwood 2000g
P-30-001546, Site B-8	Prehistoric archaeological site	Shell deposit	Records search area	Unevaluated	Underwood 2000h
P-30-001568 (CA-ORA-1568)	Prehistoric archaeological site	Shell, burned animal bone, debitage	Records search area		Mason 2009a:Table 1
P-30-001572 (CA-ORA-1572)	Prehistoric archaeological site	Shell	Records search area		Mason 2009a:Table 1
P-30-001644 (CA-ORA-1644), Boeing S-1	Prehistoric archaeological site	Shell midden, burned animal bone, midden; buried under fill	Records search area	Unevaluated	Mason 2009b:Table 1; Willey 2006
Burial 4 (B4)	Prehistoric archaeological site	Buried Millingstone Period human burial	Records search area (no record at SCCIC)	Reburied in preservation area	Cleland et al. 2007:137, Figure 11-1, Table 11-1
Burial 23 (B23)	Prehistoric archaeological site	Buried human burial	Records search area (no record at SCCIC)	Reburied in preservation area	Cleland et al. 2007:137, Figure 11-1
Burial 25	Prehistoric	Buried human	Records search	Reburied in	Cleland et al.

Resource Designation	Type	Description	Location	Significance	Source
(B25)	archaeological site	burial	area (no record at SCCIC)	preservation area	2007:137, 139, Figure 11-1
Burial 31 (B31)	Prehistoric archaeological site	Buried human burial	Records search area (no record at SCCIC)	Reburied in preservation area	Cleland et al. 2007:137, 139, Figure 11-1
Prehistoric trash pit	Prehistoric archaeological site	Intermediate Period, buried trash or hearth pit; FAR, animal bone, shell, and bone awl	Records search area (no record at SCCIC)	Unknown	Cleland et al. 2007:137, Figure 11-1, Table 11-1
Ochre deposit	Prehistoric archaeological site	Natural ochre deposit	Records search area (no record at SCCIC)	Reburied in preservation area	Cleland et al. 2007:137, Figure 11-1, Table 11-1
ETU Cluster B23	Prehistoric archaeological resource	Animal bone, Monterey chert bifacial tool, 3 pieces of debitage (quartz and CCS)	Records search area (no record at SCCIC)	Unknown	Cleland et al. 2007:139
ETU Cluster B25	Prehistoric archaeological resource	Animal bone	Records search area (no record at SCCIC)	Unknown	Cleland et al. 2007:139
ETU Cluster B31	Prehistoric archaeological resource	Animal bone, 7 pieces of debitage (chert, other CCS, quartz), quartz flake scraper, schist charmstone, hammerstone, biface, burnt metate	Records search area (no record at SCCIC)	Unknown	Cleland et al. 2007:139
ETU Cluster 263	Prehistoric archaeological resource	Groundstone fragments	Records search area (no record at SCCIC)	Unknown	Cleland et al. 2007:139
ETU Cluster 262/1472	Prehistoric archaeological resource	Chert core, 1 piece of debitage, volcanic metate, schist groundstone fragments	Records search area (no record at SCCIC)	Unknown	Cleland et al. 2007:139
Historic trash pits	Historic archaeological site	Unknown	Records search area (no record at SCCIC)	Unknown	Cleland et al. 2007:Figure 11-1
Historic Built Environment Resources					
P-19-003040	Historic industrial	Bayshore Oil Tank Farm	Records search area; Bellflower Ave/Colorado St	Not evaluated	Cardenas et al. 2013; Ferraro 2000; McCormick and

Resource Designation	Type	Description	Location	Significance	Source
					Ferraro 2002
P-19-178684	Historic residential	Rancho Los Alamitos	Records search area; 6400 Bixby Hill Rd	NRHP-listed 1981; CRHR-listed	Cardenas et al. 2013; Sanquist 1981; SDM 1981
P-19-186115	Historic commercial	Long Beach Marine Stadium	Records search area; 5255 Paoli Way	NRHP not eligible 1990; CHL #1014, 1994; CRHR-listed; POHI LAN-056	Anonymous n.d.; Cameron 1992; Cardenas et al. 2013; City Council 1994; Cryder n.d.; Fulton and Fulton 2009; Goodhue 1992; Kell 1992; Lortie 1993; SHRC 1993, 1994
P-30-186926	Historic industrial structure	Los Alamitos Retarding Basin-Pump Station	Records search area; 1st St, Seal Beach	Not evaluated	Cardenas et al. 2013; Shepard 2003
P-19-187656	Historic medical buildings	Long Beach Veterans Medical Center	Records search area; 5901 E. 7th St	NRHP-ineligible, 2003, 2006	Cardenas et al. 2013; Marvin and Harper 2002; MBA 2006; Taniguchi 2006; Taniguchi and Taniguchi 2006a, 2006b
P-19-187657	Historic ranching	Bixby Ranch Field Office	Records search area; 6433 Westminster Ave	Recommended eligible for the NRHP	Cardenas et al. 2013; Strudwick et al. 1996
P-30-176840	Historic military	Naval Weapons Station	Records search area; 800 Seal Beach Blvd	NRHP not eligible, 1998	Cardenas et al. 2013; JRP 1999
P-19-186880	Historic industrial structures	AGS Fuel Tank Farm	PAA (1-parcel buffer): 609 N. Studebaker Rd	NRHP/CRHR-ineligible, 2004 (demolished 2010)	AES 2013:5.3-25; Cardenas et al. 2013; Strudwick 2004
P-30-176752	Historic building	Parasol Restaurant	Records search area	Unknown	Mason 2009a:Table 1
P-30-179859	Historic district	Naval Weapons Station Seal Beach Historic District	Records search area	Unknown	Mason 2009a:Table 1
P-30-179863	Historic object	Ship model: USS *Los Angeles*	Records search area	Unknown	Mason 2009a:Table 1
Notes: AGS = Alamitos Generating Station; Ave = avenue; Blvd = boulevard; CA = California; CCS = cryptocrystalline silicate stone (chert, jasper, etc.); CHL = California Historical Landmark; CRHR =					

Resource Designation	Type	Description	Location	Significance	Source
California Register of Historical Resources; CSULB = California State University, Long Beach; ETU = exploratory test unit; FAR = fire-affected rock; LAN = Los Angeles County; MBA = Michael Brandman Associates; NRHP = National Register of Historic Places; PAA = project area of analysis; PCAS = Pacific Coast Archaeological Society; POHI = Point of Historical Interest; Rd = Road; SCCIC = South Central Coastal Information Center; SHRC = State Historical Resources Commission; St = street					

Appendix CR-1 Table 5
Archaeological Sites on Alamitos Mesa

Site Number/Name	Site Components	Date Recorded/Updated	NRHP/CRHR Eligibility	Contributing Element to PCSC
CA-LAN-102	Midden, shell, debitage, pestle, mano, and projectile point	1966/ destroyed in 1973 by construction		No
CA-LAN-231	Midden, shell	1961		Yes
CA-LAN-232	Midden, shell	1961		Yes
CA-LAN-233	Midden, shell	1961		Yes
CA-LAN-234	Shell, lithic debitage, human remains	1960/1964/1972	NRHP listed	Yes
CA-LAN-235	Human remains, shell, lithic debitage	1960/1972	NRHP listed	Yes
CA-LAN-271	Midden, shell, hammerstone, debitage,	1959		Yes
CA-LAN-273	Midden, shell, bowl rim, chopper, lithic debitage	1961		Yes
CA-LAN-274	Shell fragments	1961		Yes
CA-LAN-275	Shell fragments	1961		Yes
CA-LAN-306	Midden, shell, manos, pestles, metate fragment, steatite bowls, bifaces, projectile points, debitage, shell pendants, asphaltum, stone disc bead, shell beads	1964/1972/1997	NRHP listed	Yes
CA-LAN-702	Midden, shell, mano fragments, debitage, fish bones	1974		Yes
CA-LAN-703/The Park Estates Site	Shell fragments, midden, lithic debitage, projectile point, clam shell	1974/1994		Yes
CA-LAN-705/The CSULB Isabel Patterson Child	Shell fragments, lithic debitage, shell beads,	1974/1998 update identified additional artifacts and		Yes

Site Number/Name	Site Components	Date Recorded/Updated	NRHP/CRHR Eligibility	Contributing Element to PCSC
Development Center Site	pestle, steatite bowl fragment, utilized shell, bone tool fragments, and faunal remain of terrestrial, marine and invertebrate species	radiocarbon dated site from A.D. 1250 to late sixteenth century		
CA-LAN-1000	Midden, shell fragments	1979/1998 update expanded site, radiocarbon date to early eighteenth century		Yes
CA-LAN-1001	Midden, shell fragments	1979/1996 update suggests site no longer extant		No
CA-LAN-1002	Midden, shell fragments	1970		Yes
CA-LAN-1003	Midden, shell fragments, debitage	1977/1994 update suggests site no longer extant		No
CA-LAN-1004	Midden, shell fragments	1971/1994 update suggests site no longer extant		No
CA-LAN-1005	Midden, shell	1979		Yes
CA-LAN-1006	Midden, shell	1979		Yes
CA-LAN-1007	Midden, shell, bone fragments (possibly human)	1979/site destroyed ca. 1979		No
CA-LAN-270	Human remains (burials and cremations) , projectile points, knives, mortars, pestles, steatite bowls, charmstones, pigments, bone tools and ornaments, shell ornaments and beads, ceramics	1960/salvage excavation sometime prior to 1972		No
CA-LAN-1821	Midden, shell	1990		Yes
CA-LAN-2616/The CSULB Vivian Engineering Quadrangle Site/P-19-120041/Trace D	Midden, shell, mano and metate fragments, projectile points, chert and obsidian debitage, shell beads, spokeshaves, invertebrate and faunal remains,	1977/1998 update identified additional artifacts and expanded site to include Midden Trace D		Yes

Site Number/Name	Site Components	Date Recorded/Updated	NRHP/CRHR Eligibility	Contributing Element to PCSC
P-19-002629/Trace F second location/The CSULB Los Cerritos Hall Site	Midden, chlorite schist bead, projectile point, scrapers, spokeshave, lithic debitage, mano fragment, fire affected rock, shell and faunal remains	1977/1994 update identified additional artifacts and radiocarbon dated the site to between A.D. 100 and A.D. 300		Yes
P-19-002630/The CSULB Parking Structure Site/P-19-120052/Trace G second location/P-19-120044/Trace G	Midden, shell beads, ceramics, bone awls, projectile points, lithic debitage, steatite, obsidian, and shell and faunal remains	1977/1994 update expanded site to include both Trace G locations and identified additional artifacts		Yes
P-19-120038/Trace A	Traces of midden and shell	1977		Yes
P-19-120039/Trace B	Traces of midden and shell	1977		Yes
P-19-120040/Trace C	Traces of midden and shell	1977		Yes
P-19-120042/ race E	Traces of midden and shell	1977		Yes
P-19-120043/ race F	Traces of midden and shell	1977		Yes
P-19-120045/Trace H	Traces of midden and shell	1977		Yes
P-19-120046/Trace I	Traces of midden and shell	1977		Yes
P-19-120047/Trace J	Traces of midden and shell	1977		Yes
P-19-120048/Trace K	Traces of midden and shell	1977		Yes
P-19-120049/Trace L	Traces of midden and shell	1977		Yes
P-19-120050/Trace B second location	Traces of midden and shell	1977		Yes
P-19-120053/Trace J second location	Traces of midden and shell	1977		Yes
Abbreviations: CA = California; CRHR = California Register of Historical Resources; CSULB = California State University, Long Beach; LAN = Los Angeles County; NRHP = National Register of Historic Places; PCSC = Puvungna Ceremonial Site Complex				

Appendix CR-1 Table 6
Summary of Cumulative Projects—Archaeological Resources

Project Title	Location	Project Description	Resources Affected/Level of Significance	References
AES Battery Energy Storage System	Project site	Three 100-MW containment buildings. Each building to be 50 ft tall x 270 ft long x 165 ft wide (44,550 sf, or about 3 ac). Each to contain: two battery storage levels, electrical controls, & HVAC units.	Information pending CEQA review	
Alamitos Barrier Improvement Project	Westminster Ave at Canoe Brook Dr, Seal Beach	Drill and construct injection and monitoring wells, and construct and operate shallow piezometers. Injection wells, three monitoring wells, and two piezometers would be constructed along western side of Los Alamitos Channel. One monitoring well and two piezometers constructed within Leisure World community.	As-yet-unidentified/ LTSWM	OCWD 2013:7
Alamitos Bay Bridge Improvement Project	Long Beach	Project crosses the Los Cerritos Channel on the PCH in Long Beach.	Information pending NEPA/CEQA reviews	
PCH & 2nd	6400 E. PCH, Long Beach	About 216,000 sf retail uses, ~ 29,000 sf restaurant uses, and surface and structured parking. Replaces Seaport Marina Hotel. Proposed one- and two-story buildings 20–35 ft tall.	None/LTSWM	PCR 2011:IV.D-18
Colorado Lagoon Restoration Project	Long Beach	Habitat and recreation improvements to the Colorado Lagoon and adjacent areas, including Marina Vista Park & a small area at Marine Stadium, which make up a 48.61-ac project area/park site in Long Beach. The lagoon is an 11.7-ac tidal water body.	None/LTS	LSA 2008a:4.4-9
Humboldt Bridge Preventative Maintenance		Project to perform maintenance activities on the existing Humboldt Dr bridge to restore the	As-yet-unidentified/ LTSWM	Beckman 2015:60–61

Project Title	Location	Project Description	Resources Affected/Level of Significance	References
Project		integrity of its original design.		
Belmont Pool Revitalization	4000 East Olympic Plaza, Long Beach	Demolition of existing Belmont Pool and construction/operation of replacement pool complex Seating for 3,500 spectators through permanent and portable seating in indoor and outdoor areas.	None/LTS	LSA 2014:18–19
Sunset Gap Monitoring Wells Project	Bolsa Chica Rd at Edinger Ave, Seal Beach and Huntington Beach	Construct/operate six monitoring wells, destroy existing monitoring well at NWSSB and two existing monitoring wells in Huntington Beach.	As-yet-unidentified/ LTSWM; under construction	ICFI 2014:3-35–3-40
Safran Senior Housing Project	3215 E. 3rd St and 304 Obispo Ave, Long Beach	Convert Immanuel Community Church into senior housing with 24 independent low or very low income units, one manager's unit, and associated amenities/common areas in 31,006-sf floor area. Demolish single-family home to construct surface parking lot.	None/LTS	CLB 2012:Appendix A
Los Alamitos Medical Center	3751 Katella Ave, Los Alamitos	Replace and add new buildings to the Los Alamitos Medical Center, including construction of two four-story hospital buildings.	None/No impact	RBF 2010:28
Barton Place	Northeast corner of Katella Ave & Enterprise Dr, Cypress.	Build a senior residential community & commercial/retail improvements on Katella Ave. The site covers 33 ac.	None/No impact	LSA 2015:40–42
CA Army National Guard & U.S. Army Reserve New HQ Facilities	4250 Constitution Ave, Los Alamitos	Addition of four buildings and demolition of three buildings.	Unknown; complete	
Village at Los Alamitos	Los Alamitos Blvd, Los Alamitos	133 residential units and 5 retail units.	No cultural resources information available	
4201 E. Willow	4201 E. Willow St, Long Beach	Mixed-use development with 9,121-sf retail building and 4,296-sf automated car wash. Demolish portions of	None/LTSWM	LSA 2011:42–44

Project Title	Location	Project Description	Resources Affected/Level of Significance	References
		existing dealership.		
East Division Police Substation Project	3800 E. Willow St, Long Beach	Transfer Schroeder Hall USARC property from the U.S. DOD to CLB. Relocate existing Long Beach Police Department East Division Substation and Juvenile Investigations Section to Schroeder Hall site. Various minor improvements to existing USARC facility.	None/LTS	RBF 2013a:4.5-7
Rofael Marina and Caretaker Facility	16926 Park Ave, Huntington Beach	Construct marina on a 6,179-sf property.	None/No impact	Nguyen 2015:28–29
Ocean Blvd Project	1628–1724 Ocean Blvd, Long Beach	Demolish existing structures, develop 51 condo units and remodel existing building to maintain 11 motel units. Residential development would be four stories in height above street level with two levels of subterranean parking.	None/No impact	CLB 2009b:8, 21–22
Big box retail	1745 PCH, Long Beach	Construct a new 120,000-sf big box retail project on 9.88 acres.	No information	
Camp Fire Girls Building	7070 Carson Ave, Long Beach	6,742-sf camping lodge building.	No information	
Harmony Cove Marina Development	3901 Warner Ave, Huntington Beach	Develop 23-boat slip marina, concession stand, and ancillary uses, on 2.28 ac.	None/No impact	CHB 2012a:41–42
Warner Ave Bridge Preventative Maintenance Project	PCH at Warner Ave, Huntington Beach	Bridge improvements of Warner Avenue Bridge.	As-yet-unidentified/ LTSWM	CHB 2012b:65–66
Pacific Pointe East Development Project	Lakewood Blvd and Conant St, Long Beach	Three new industrial buildings on undeveloped site with paved surface parking lot. Maximum height of about 41 ft and total floor area of 494,000 sf.	None/LTS	Rincon 2014a:16
Airport Circle Residential Project	16911 Airport Cir Huntington Beach	Develop 45 condominium subdivision and associated open space. The site layout consists of 8 detached three-story buildings with 4–8 attached dwelling units. Units are 1250–1940 sf.	None/LTS	Villasenor 2014:35–36

Project Title	Location	Project Description	Resources Affected/Level of Significance	References
925 East Pacific Coast Highway Lease Acquisition Project	925–945 E. PCH, Long Beach	Demolish or rehabilitation the existing project site building for the purposes of blight removal. The project site totals 15,795 sf (0.36 ac).	None/LTS	Chalfant 2010:15–17
New Medical Building	300 Alamitos Ave, Long Beach	New 14,325-sf mixed-use medical office building with senior housing. In Downtown Plan area.	As-yet-unidentified/LTS-WM	AECOM 2010:4.3-14–4.3-15
Mixed-Use Project	125 Linden Ave, Long Beach	Five-story, 25-unit apartment building with 1,257 sf of retail space.	No information	
Polytechnic High School Auditorium AB 300 Project	Atlantic Ave at E. 15th St, Long Beach	Seismic retrofit and upgrades to existing Auditorium Building.	None/No impact	Chambers 2014:43–44
Douglas Park - Medical Office	NW corner of Worsham Ave and Cover St, Long Beach	Three new industrial buildings with the following square footages: 149,077; 192,373 and 160,626; and new parking.	As-yet-unidentified/LTS-WM	Matrix 2009:III-42
The Ridge	Bolsa Chica St and Los Patos Ave, Huntington Beach	5-acre development of 22-single family residences.	CA-ORA-86/LTWSM	CHB 2008:43–45
Apartment Building	207 E. Seaside Way, Long Beach	Project would consist of a 113-unit multi-family apartment complex on 0.67-ac. Project would include a single structure consisting of eight levels (one subterranean level & seven aboveground levels). Bottom three levels would provide 144 on-site parking spaces. Apartment structure would be 85 ft above the East Seaside Way grade. Amenities include a cafe, fitness center, retail space, & a lobby.	As-yet-unidentified/LTS-WM	RBF 2015a:47–49
Urban Village on Long Beach	1081 Long Beach Blvd, Long Beach	Five-story building containing 129 condominium units and parking within integrated five-level parking garage. Building would stand approximately 58 ft above Long Beach Blvd grade.	None/LTS	DDS 2012:15–16
1235 Long Beach Blvd Mixed-Use	South of E. Anaheim St and north of E. 12th St,	Demolish existing on-site uses and construct 3 buildings containing 170	None/LTSWM	LSA 2008b:25, 27

Project Title	Location	Project Description	Resources Affected/Level of Significance	References
Project	between Locust Ave and Long Beach Blvd, Long Beach	residential condominium units, 186 senior apartment units, and 42,000 sf of retail/restaurant area.		
Pine Square Theater Conversion to Residential	250–270 Pacific Ave, Long Beach	Convert the theater space from the closed AMC Pine Square movie theater into 69 residential apartment units (112,079 sf) in two levels. The existing 142 residential dwelling units will remain, as well as the existing retail spaces on Pine Ave, 3rd St and Broadway. Build about 538 sf of commercial retail space.	None/No impact	DDS 2011:16–17
Parkside Estates	West side of Graham St, south of Warner Ave, Huntington Beach	Includes 111 single family residences, 23 ac of preserved, restored and enhanced open space, 1.6-ac neighborhood park, public trails, and creation of a water quality treatment system.	CA-ORA-83/86, CA-ORA-1308, and CA-ORA-1309/Significant impact on CA-ORA-1308 and CA-ORA-1309	EDAW/ AECOM 2009:3-41–3-43
Oceanaire Apartment	150 West Ocean Blvd, Long Beach	Project is a 216-unit multi-family/mixed-use apartment complex on the 1.76-ac site. It would include a single structure consisting of 7 levels along West Ocean Blvd & 5 levels along West Seaside Way, above a 2-level parking structure with ingress/egress along West Seaside Way. The apartment structure would be 85 ft tall above West Ocean Blvd grade & 106.5 ft above West Seaside Way grade. The project would implement improvements at Victory Park & a dog and fitness park on the southwest corner of the site.	None/LTSWM	RBF 2015b:51–52
Aquarium of the Pacific "Pacific Visions" Expansion	100 Aquarium Way, Long Beach	Construct a 23,330-sf addition to an existing 166,447-sf aquarium. The project consists of a new wing with a "media-based chamber," an expanded	As-yet-unidentified/LTS-WM	Kinsey 2010:12–13

Project Title	Location	Project Description	Resources Affected/Level of Significance	References
		retail store, & a new front entrance.		
442 W. Ocean Boulevard Project	442 West Ocean Blvd, Long Beach	Build a 95-unit multi-family apartment complex on the 0.5-ac site. It would include a single structure consisting of nine levels (one subterranean level & eight aboveground levels). Bottom three levels would provide 153 on-site parking spaces. Apartment structure would be 85 ft above West Seaside Way grade. Amenities include lobby space, fitness center, & roof deck.	As-yet-unidentified/LTS-WM	RBF 2015c:47–48
Cypress Village Shopping Center	9515–9575 Valley View St, Cypress	Remodel and upgrade the shopping center. Project consists of: 1) demo of 6,982 sf of retail area in Building 1 & 2,586 sf of retail area in Building 2; 2) exterior façade remodel of existing buildings; 3) improvements to existing parking lot. The site covers 2.37 ac.	None/No impact	Cypress 2015:33
Edinger Walmart	6856 Edinger Ave Huntington Beach	Build store in an existing 100,865-sf vacant retail building within an existing commercial center.	See *Beach Blvd/ Edinger Corridors Specific Plan* below.	
Drake Park Soccer Field	Along lower Los Angeles River in Long Beach to link Cesar E. Chavez Park to Drake Park & Loma Vista Park, Long Beach.	Acquire 31 ac of former industrial and abandoned railroad property & develop wetlands, habitat, & active and passive recreation areas. Create a 64-ac park from Cesar E. Chavez Park to Drake & Loma Vista parks. Continuous park space between Anaheim St & Broadway to link the Los Angeles River Bike Path Two new soccer fields are part of the project. Demo & grading, installation of drainage system, basketball court, synthetic soccer field, constructing Portland	Prehistoric shell midden, human remains/LTSWM	LSA 2013b:26–29

Project Title	Location	Project Description	Resources Affected/Level of Significance	References
		cement concrete infrastructure, installing asphalt paving, park furnishings, lighting & electrical, prefabricated restroom installation, underground water, sewer pipelines, electrical service, landscape & irrigation for approximate 8-ac site.		
Monogram Apartments (formerly Pedigo)	7262 Edinger Ave Huntington Beach	Four-story with lofts apartment building consisting of 510 dwelling units, 25,815 sf public open space, 55,396 sf private open space, and 5,097-sf leasing office wrapped around a 6-level 862-space parking structure.	As-yet-unidentified/LTS-WM	Arabe 2013:50–51
Huntington Beach Lofts	7400 Center Ave, Huntington Beach	Project is on a 3.8-ac site with 385 luxury residential units in five residential stories, located above 10,000 sf of street level retail and commercial uses.	As-yet-unidentified/LTS-WM	PBS&J 2008a:4.4-1–4.4-10
Mitsubishi Cement Facility Modification Project	1150 Pier F Ave, Long Beach	Modify an existing facility, including: install an emission control system; construct four 10,000-metric ton storage & truck loading silos; upgrade existing facilities & ship unloading equipment. Current 4.21-ac site would be enlarged to 5.92 ac.	None/No impact	Watanabe 2011:21
Pacific Crane Maintenance Company Chassis Support Facility Project	1402 Pier B St, Long Beach	Build a facility for the distribution, storage & maintenance of chassis used to move cargo containers. Located on a 13.24-ac site. Facility components include: ingress & egress gates, admin & staff trailers, on-site parking spaces & designated areas for chassis storage, chassis maintenance, parts/miscellaneous storage, & tire support.	None/No impact	Beherec 2015; PLB 2015:42–44
The Boardwalk	7461 Edinger Ave	487 dwelling units and	As-yet-	PBS&J

Project Title	Location	Project Description	Resources Affected/Level of Significance	References
(Murdy Commons)	Huntington Beach	14,500 sf of commercial area on a 12.5-ac site with 0.5-ac public park.	unidentified/LTS	2010:4.4-1–4.4-5
The Village at Bella Terra	7777 Edinger Ave Huntington Beach	Develop a regional commercial big-box retail with gasoline service station and a mixed-use retail and residential project. 154,113-sf Costco Wholesale store with tire sales/installation center, gas station, and two new elevators on the existing public parking structure. The project includes 467 multi-family residential units within a 4-story building along with 13,500 sf of residential amenities, 17,500 sf of mixed-use retail and restaurant uses; an additional 12,000 sf of freestanding retail and restaurants and a 1,920-sf pavilion building within a greenbelt area.	As-yet-unidentified/LTS	PBS&J 2008b:4.4-1–4.4-10
Oregon Park	4951 Oregon Ave, Long Beach	Develop a 3.3-ac lot with a neighborhood park. Proposed improvements include a soccer field with lights, a tot lot, group picnic area, walking path & prefabricated restrooms. A total of 42 parking spaces would be added & a portion of the public right of way & Los Angeles flood channel would be landscaped.	None/No impact	Planning Bureau 2010:9, 26
Fresh & Easy Neighborhood Market	3300 Atlantic Ave, Long Beach	Construct new single-story, 14,304-sf store plus parking.	None/LTS	DDS 2010:17–19
Living Spaces	6812 Edinger Ave, Huntington Beach	Furniture store to occupy a little over 100,000 sf & enclose 5,000-sf outdoor storage area.	Completed/No information	
Mackay Place Project	Walker St & Delong St, Cypress	Demolish on-site buildings, parking lots, and landscaped areas. Build 47 detached single-family homes around a central street system with access to Walker St on	None/No impact	RBF 2013b:22–23; RBF 2014:8-1, 8-2

Project Title	Location	Project Description	Resources Affected/Level of Significance	References
		6.8 ac. Remaining 2.9 ac acquired by city of Cypress for future park.		
Weiland Brewery Restaurant	4354 Atlantic Ave, Long Beach	3,382-sf full service restaurant with fixed bar and patio dining area.	No information	
Riverwalk Residential Development Project	4747 Daisy Ave, Long Beach	Project site is 10.56 ac on a former Boy Scout Camp. Subdivide the project site & develop it into a gated residential community containing 131 detached single family homes on lots with a minimum square footage of 2,400.	As-yet-unidentified/PSI	Rincon 2014b:13
Ramona Park Senior Apartments	3290 & 3232 Artesia Blvd, Long Beach	Three-story apartment building.	None/No impact	MBA 2009:11, 34
North Village Center Redevelopment Project	Bounded by South St, Linden Ave, 59th St, and Lime Ave, Long Beach	Redevelop a 6.3-ac site with a mixed-use "village center" project: up to 61 units of multi-family housing in a mix of row houses, courtyard units, & units built atop ground floor non-residential space; up to 36,000 sf of commercial retail space, including restaurant space, oriented primarily toward Atlantic Ave, and; a public library & community center totaling 30,000 sf fronting Atlantic Ave.	As-yet-unidentified/ LTSWM	CLB, with Rincon 2009:4.3-16, 4.3-17
Pier S Marine Terminal and Back Improvements	Bounded by Cerritos Channel and Pier A Marine Terminal; Back Channel, SCE property, and Long Beach Generation Plant; Ocean Blvd and Pier T; and SR 47, Vopak Terminal Long Beach and city of Long Beach property, Long Beach	Excavation of existing shoreline to realign dike and widen the Channel to 808 ft between the Pier A and future Pier S pier head lines. 600,000 cy of material would be dredged from the Cerritos Channel. Targeted areas in the Back Channel would be dredged to extend the navigable width of the channel to a total of 315 ft.	None/No impact	PLB 2007:24–25
Jordan High School Major Renovation Project	Atlantic Ave & Artesia Blvd, Long Beach	Demolish 10 permanent buildings and 32 portable buildings, renovate approximately 213,000 sf	None/LTSWM	AECOM 2013:4-3

Project Title	Location	Project Description	Resources Affected/Level of Significance	References
		existing building space, and build 240,000 sf new buildings. Project contained within existing school boundaries.		
Fisherman's Pride Processors Project	338 Cannery St, Los Angeles	Redevelop 91,500 sf industrial space into commercial seafood processing facility with freezer and 56,700 sf of vacant land into parking area and new 5,700-sf structure. Repair existing structures, update infrastructure, replace interior office and restroom spaces, construct mechanical and storage spaces, and enhance exterior of existing buildings.	None/LTSWM	AECOM 2014:3-6, 4.5-3–4.5-5
Rehabilitation of Western Regional Sewers, Project No. 3-64	Cities of La Palma, Buena Park, Cypress, Anaheim, Los Alamitos, Seal Beach, & Rossmoor. Westside Pump Station is at 3112 Yellowtail Dr	OCSD proposes to rehabilitate &/or replace entire lengths of four regional pipelines. In addition to pipeline and manhole replacement or rehabilitation, project includes rehabilitation/replacement of the Westside Pump Station force main, reconstruction of the Westside Pump Station wet well, & construction of a new vent line from the wet well to the downstream manhole or construction of an odor control scrubber.	None/LTSWM	Jacobs 2015:33–35
Alamitos Bay Marina Rehabilitation Project	Adjacent to the mouth of the San Gabriel River, Long Beach.	Renovate the existing marina facilities & enhance existing recreational boating facilities. Improvements include: (1) dredging the marina basins down to original design depths and/or original basin depths; (2) replacing and/or upgrading 13 restrooms & their associated water & sewer laterals; (3) repairing the sea wall; (4) completing	None/LTS	LSA 2009:4.4-1–4.4-9

Project Title	Location	Project Description	Resources Affected/Level of Significance	References
		dock & piling replacement; & (5) replacing the pavement in the marina's parking lots. The project includes two construction staging areas: one located in a parking lot on Marina Dr near Basin 2; & the other in a parking lot on Marina Dr near Basin 3, adjacent to the Marina Shipyard.		
I-405 Improvement Project	I-405 between SR-73 and I-605, Los Angeles and Orange counties	Add 1 GP lane, 2 GP lanes, or 1 GP lane and a tolled express lane in each direction to be managed with the existing HOV lanes as a tolled express facility between SR-73 and I-605. Improvements primarily in Orange County for 16 mi between 0.2-mi south of Bristol St and 1.4 mi north of I-605, as well as portions of SR-22, SR-73, and I-605.	CA-ORA-113, CA-ORA-162/LTSWM	Caltrans 2012a:4-8–4-9
Wrigley Village Streetscape Enhancement Master Plan	Pacific Ave between PCH and Willow St, Long Beach	Phase I: median island landscaping on Pacific Ave from PCH to 20th St. Phase II: complete median island landscaping to Willow St. Add pedestrian street lighting on Pacific Ave from PCH to Hill St.	Completed/No information	
Magnolia Industrial District Street Enhancement Program	PCH, Anaheim St, Magnolia and San Francisco Ave, Long Beach	Remove concrete and asphalt surfaces and abandoned railway track and ties. Construct cement concrete curbs, gutters, sidewalks, and asphalt street pavement on Oregon and Daisy Ave between Anaheim St and PCH. New traffic signaling at intersection of Anaheim and Oregon.	Completed/No information	
I-710 Corridor Project	I-710 from Ocean Blvd, Long Beach to Commerce/Vernon	Widen to 5 mixed flow and 2 dedicated lanes for clean technology trucks (each direction) and interchange improvements.	As-yet-unidentified/ LTSWM	Caltrans 2012b:4-17, 4-18
AGS Units 1–6	Project Site	Demolish Units 1–6 after	Information	

Project Title	Location	Project Description	Resources Affected/Level of Significance	References
		construction of the AEC.	pending CEQA review	
Los Cerritos Wetlands Conceptual Restoration Plan & Mitigation Bank	Between the PCH, Los Cerritos Channel, Studebaker Rd, and 2nd St, Long Beach.	Establish a mitigation bank & wetlands habitat restoration area on the Synergy Oil Field. The mitigation bank would cover 76 ac & restored wetlands would cover 72 ac of the 152-ac oil field. Construct public access improvements. Remove approx. 37 oil wells. Drill 70 new oil wells on an adjacent 5- ac property and at the nearby 7-ac "Pumpkin Patch" property. Approximately 50 new oil wells would be drilled on the "Pumpkin Patch." Remove approx. 21 oil wells from CLB's adjacent 33 ac.	Six archaeological sites/Categorically exempt from CEQA	Moffatt and Nichol 2012:56
Haynes Generating Station	6801 2nd St, Long Beach	Add six LMS100 simple-cycle gas turbines and two emergency diesel-powered generators.	None/LTS	Environment-al Services 2009:3-8–3-9
Ocean Place Seal Beach	First and Marina, Seal Beach	28 single-family homes, four cottages, 6-ac park	No information	
Douglas Park Rezone Project	Bound by Carson St to north, Lakewood Blvd to east, Conant St to south & west, Long Beach	Approximately 3.75 million sf of commercial/ light industrial uses, up to 250,000 sf of retail uses, and a hotel use consisting of up to 400 rooms. Additional retail space could be developed in expansion areas of Subareas 1 and 2 of PD-32 North.	None/LTSWM	CLB 2009c:17–18
Brightwater Specific Plan and Annexation	Warner Ave at Los Patos, Huntington Beach	105.3-ac residential subdivision, including 349 single-family residences.	None/No impact	CHB 2006:9, 28–29
New Civic Center Project	Downtown Long Beach on 15.87 ac. Consists of two discontiguous parcels that are generally bounded by 3rd St, Pacific Ave, Magnolia Ave, & Ocean Blvd.	Build a new City Hall, new Port Building for Harbor Department administration, new & relocated Main Library, redeveloped Lincoln Park, residential development, & commercial mixed use development. Proposal includes six new buildings, three parking	As-yet-unidentified/LTS-WM	Carmack and Hunt 2015:56; CLB 2015a:21–23; Development Services 2015:4.3-8, 4.3-12

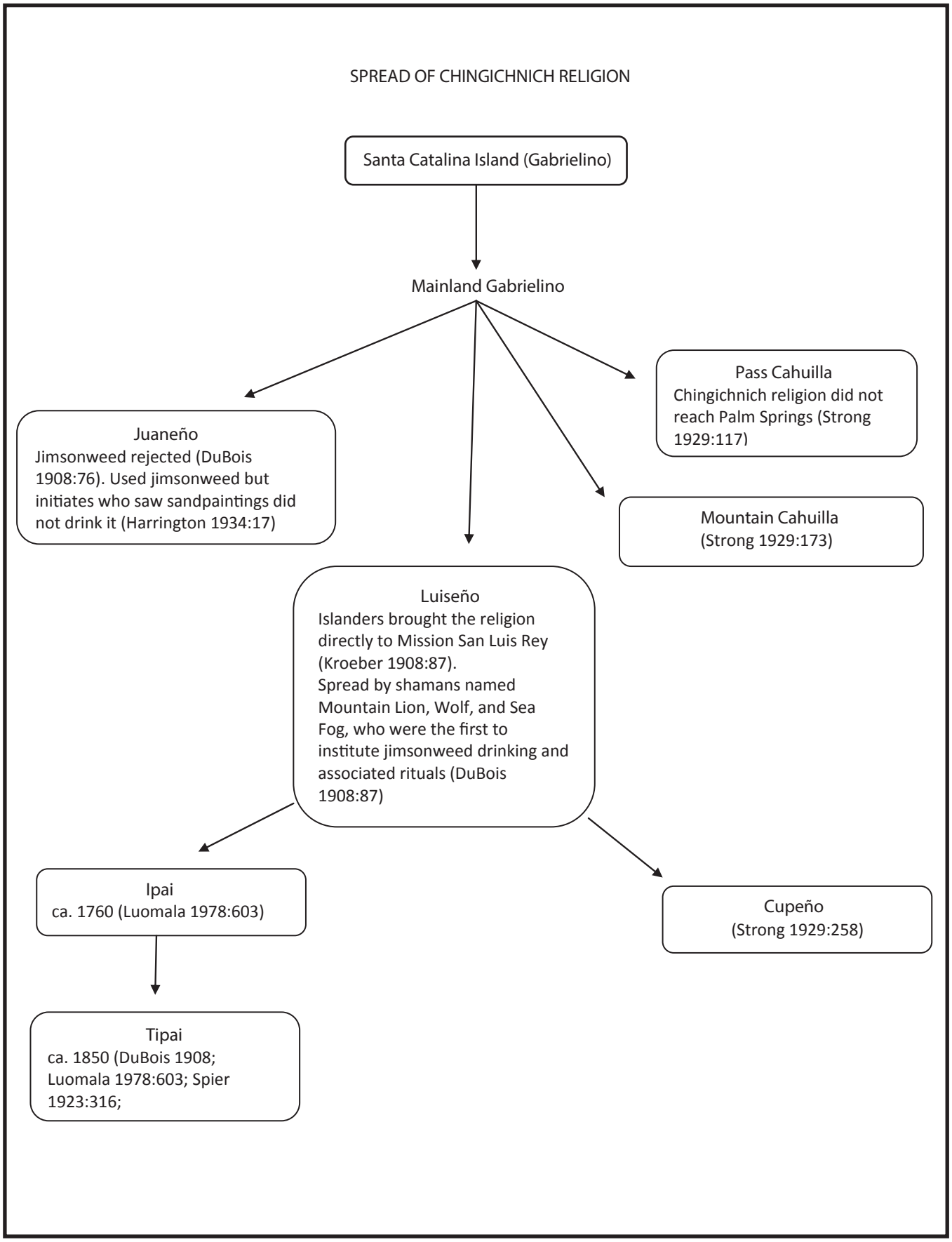
Project Title	Location	Project Description	Resources Affected/Level of Significance	References
		garages, related infrastructure & landscaping, & two street extensions of Chestnut & Cedar avenues through the project site. The City Hall & Port buildings would be 11 stories high. Project includes demo of the former Long Beach Courthouse (demo studied in draft EIR (SCH# 2014051003) circulated Oct. & Nov. 2014).		
Weber Metals Large Press Expansion	16706 Garfield Ave Long Beach and Paramount	Expansion existing facility through installation of a new 60,000-ton forging press in a new 115,000-sf building This building would require an 85-ft-deep excavation pit to house the press & a 65-ft-high main roof.	None/LTSWM	CLB 2015b:19–20
Golden Shore Master Plan	Bounded by Ocean Blvd, Shoreline Dr, and parking lots associated with Arco Center, Long Beach	New residential, office, retail, and potential hotel uses with associated parking and open space. Residential Option would include 1,370 condos, an estimated 340,000-sf office space, 28,000 sf retail, parking, open spaces, and other amenities. Under hotel options, development includes 1,110 condos, 400-room hotel including 27,000-sf conference & banquet space, approximately 340,000 sf office, 27,000 sf retail, parking, open spaces, and other amenities.	As-yet-undiscovered/ LTSWM	CLB 2009d:IV.C-30–IV.C-32
Baker Cold Storage Facility Project	1710 Pier B St, Long Beach	Construct and operate a roughly 250,000-sf cold storage facility to receive, sort, store, and distribute perishable commodities.	None/No impact	PLB 2013:53, 54
CSULB Foundation Retail Project	PCH and Cota Ave, Long Beach	Demolish the existing buildings and carports and construct a one-story building for retail use up to 122,500 sf and on-site parking.	Unknown/ LTSWM	LSA 2013a:15, 16

Project Title	Location	Project Description	Resources Affected/Level of Significance	References
Admiral Kidd Park Expansion Site	NW corner of Santa Fe Ave and Willard St, Long Beach	Acquisition and development of industrial property for a 120,000-sf park expansion.	None/No impact	Hungerford 2008:10, 26–27
Beach Blvd/ Edinger Corridors Specific Plan	Beach Blvd, Huntington Beach	Enhance and maximize economic opportunities along Beach Blvd and Edinger Ave (includes Edinger Walmart project).	As-yet-unidentified/SU	PBS&J 2009:4.4-13, 4.4-14

Notes: ac = acre(s); AEC = Alamitos Energy Center; AGS = Alamitos Generating Station; Ave = avenue; Blvd = boulevard; CA = California; Caltrans = California Department of Transportation; CHB = city of Huntington Beach; CEQA = California Environmental Quality Act; Cir = Circle; CLB = city of Long Beach; CSULB = California State University, Long Beach; cy = cubic yards; DDS = Department of Development Services (city of Long Beach); DOD = Department of Defense; Dr = drive; ft = feet; GP = general purpose; HOV = high occupancy vehicle; HQ = headquarters; I = Interstate; ICFI = ICF International; LSA = LSA Associates; LTS = less than significant; LTSWM = less than significant with mitigation; mi = miles; MBA = Michael Brandman Associates; MW = megawatt(s); NEPA = National Environmental Policy Act; NW = northwest; NWSSB = Seal Beach Naval Weapons Station; OCSD = Orange County Sanitation District; OCWD = Orange County Water District; PCH = Pacific Coast Highway; ORA = Orange County; PCR = PCR Services Corporation; PLB = Port of Long Beach; PSI = potentially significant impact; RBF = RBF Consulting; Rd = road; SCE = Southern California Edison; sf = square feet; SR = State Route; St = street; SU = impact; USARC = U.S. Army Reserve Center

CULTURAL RESOURCES - APPENDIX FIGURE 1

Alamitos Energy Center - Spread of Chingichnich Religion



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: CEC Staff

CULTURAL RESOURCES ABBREVIATION AND ACRONYM GLOSSARY

ac	acre(s)
ACC	air-cooled condenser
AEC	Alamitos Energy Center
AGS	Alamitos Generating Station
APD	Advanced Planning Division, Development Services Department, City of Long Beach
Ave	avenue
bg	below grade
Blvd	boulevard
B.P.	Before Present (A.D. 1950)
Ca.	circa
CA	California
Calectric	California Electric Power Company
Caltrans	California Department of Transportation
CCS	cryptocrystalline silicate stone
CDC	California Department of Conservation
CEQA	California Environmental Quality Act
CHB	city of Huntington Beach
CHL	California Historical Landmark
CLB	city of Long Beach
CRHR	California Register of Historical Resources
CSULB	California State University, Long Beach
CTG	combustion turbine generators(s)

cy	cubic yard(s)
DDS	Department of Development Services (city of Long Beach)
DOD	Department of Defense
DON	Department of the Navy
Dr	Drive
EDR	Environmental Data Resources, Inc.
ETU	exploratory test unit
° F	degrees Fahrenheit
FAR	fire-affected rock
ft	foot, feet
gal	gallon(s)
GP	general purpose [traffic lane]
GSU	generator step-up unit
HOV	high occupancy vehicle
HRG	Historic Resources Group
HRSG	heat recovery steam generator(s)
I	Interstate
ICFI	ICF International
JRP	JRP Historical Consulting Services/JRP Historical Consulting
kV	kilovolt(s)
kW	kilowatt(s)
LA	Los Angeles [County]
LACCNAIC	Los Angeles City/County Native American Indian Commission
LADPW	Los Angeles Department of Public Works

LADWP	Los Angeles Department of Water and Power
LAn/LAN	Los Angeles County
LGM	Last Glacial Maximum
LSA	LSA Associates
LTS	less than significant
LTSWM	less than significant with mitigation incorporated
MBA	Michael Brandman Associates
mi	mile(s)
MW	megawatt(s)
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
NW	northwest
NWSSB	Naval Weapons Station Seal Beach
OAC	Online Archive of California
OCWD	Orange County Water District
OHTL	overhead transmission line
OR	Orange [County]
ORA	Orange County
PAA	Project Area of Analysis
PCAS	Pacific Coast Archaeological Society
PCH	Pacific Coast Highway (State Route 1)
PCR	PCR Services Corporation
PCSC	Puvunga Ceremonial Site Complex
PLB	Port of Long Beach
PRGTL	Pacific to Rio Grande Trails Landscape

PSA	Preliminary Staff Assessment
PSI	potentially significant impact
RBF	RBF Consulting
Rd	road
SAFC	supplemental application for certification
SB	Senate Bill
SCCIC	South Central Coastal Information Center
SCE	Southern California Edison Company
SDHC	San Diego History Center
SEMP	Suburban Emergency Management Project
sf	square foot, square feet
SHRC	State Historical Resources Commission
spp.	Species
SR	State Route
SRS	Scientific Resource Surveys
St	street
Staff	Energy Commission cultural resources technical staff
STG	steam turbine generator
SU	significant and unavoidable impact
USACE	U.S. Army Corps of Engineers
USARC	U.S. Army Reserve Center
WPLT	Western Pluvial Lakes Tradition

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