5.2 Cultural Resources

5.2 CULTURAL RESOURCES

The purpose of this section is to determine if cultural resources (including prehistoric, historic, and paleontological resources) occur within and around the project site and to assess the significance of such resources. Mitigation measures are recommended to minimize impacts to cultural resources as a result of project implementation. The information in this section is based on the following documentation:

- *A Cultural Resources Study for the Portola Center Project* (Cultural Resources Study), prepared by Brian F. Smith and Associates, Inc., dated August 29, 2011; refer to Appendix 11.2, *Cultural/Paleontological Assessment*; and

- *Paleontological Resource Assessment, Portola Center Project* (Paleontological Resource Assessment), prepared by Brian F. Smith and Associates, Inc., dated August 18, 2011; refer to Appendix 11.2, *Cultural/Paleontological Assessment*.

5.2.1 EXISTING SETTING

The following discussion provides the cultural setting of prehistoric and historic human activities within the general area of the project site as well as of the environmental and cultural settings for the project site. The cultural setting provides a framework for the identification of known resources within the area and sensitivity for undiscovered cultural resources that could be encountered within the project site.

CULTURAL SETTING

San Dieguito Complex/Paleo-Indian Period

The San Dieguito Complex/Paleo-Indian Period is associated with the terminus of the late Pleistocene (12,500 to 9,000 years before present [ybp]). The term "San Dieguito Complex" is a cultural distinction used to describe a group of people that occupied sites in the region between 11,500 and 7,000 ybp. Initially believed to have been big game hunters, the San Dieguito are better typified as wide-ranging hunter-gatherers. The earliest evidence of the San Dieguito Complex sites is known from San Diego County, the Colorado Desert, and further north along the California coast. These people abandoned the drying inland lakes of the present California desert and arrived in San Diego County circa 9,000 ybp. A San Dieguito component appears to have been present in the lower strata at the Malaga Cove site within the city of Palos Verdes Estates.

Diagnostic San Dieguito artifacts include finely crafted scraper planes, choppers, scrapers, crescentics, elongated bifacial knives, and intricate leaf-shaped points. This tool assemblage resembles those of the Western Lithic Co-Tradition and the Western Pluvial Lakes Tradition. Typical San Dieguito sites lack groundstone tools. The San Dieguito Complex is the least understood of the cultures that occupied the southern California region. Debate continues as to whether the San Dieguito sites are actually different activity areas of the early Encinitas Tradition peoples, or whether the San Dieguito Complex peoples had a separate origin and culture from the Encinitas Tradition. According to this second scenario, the San Dieguito Complex peoples may

have been assimilated into the dominant Encinitas Tradition culture. A third possibility is that the San Dieguito Complex gave rise to the Encinitas Tradition.

Archaic Period

The Archaic Period begins with the onset of the Holocene around 9,000 ybp. The transition from the Pleistocene to the Holocene was a period of major environmental change throughout North America. In southern California, the general climate at the beginning of the early Holocene is marked by cool/moist periods and an increase in warm/dry periods and rising sea levels. The warming trend and rising sea levels generally continued until the late Holocene. Archaeological research indicates that southern California was occupied between 9,000 ybp and 1,300 ybp by population(s) that utilized a wide range of both marine and terrestrial resources. A number of different archaeological manifestations based on geographical setting, tool kit, and/or chronology, are recognized during the Archaic Period, including the San Dieguito, La Jolla, Encinitas, Millingstone, and Pauma Complexes. Archaic sites generally contain milling tools, especially manos and metates, cobble and flake tools, dart projectile points and the concomitant use of the atlatl, crescents, shell, fish bone, and animal bone representing large and small game. Additionally, Archaic groups buried their dead as flex inhumations, a religious and cultural practice that is distinct from the succeeding Late Prehistoric groups.

The La Jolla Complex is regionally associated with the Encinitas Tradition and shared cultural components with the widespread Millingstone Horizon. The coastal expression of this complex, with a focus on coastal resources and development of deeply stratified shell middens located primarily around bays and lagoons, appeared in the southern California coastal areas, and some of the older sites associated with this expression are located at Topanga Canyon, Newport Bay, Agua Hedionda Lagoon, and some of the Channel Islands. Radiocarbon dates from sites attributed to this complex span a period of more than 7,000 years in this region, beginning more than 9,000 ybp.

The Encinitas Tradition is best recognized for its pattern of large coastal sites characterized by shell middens, grinding tools closely associated with the marine resources of the area, cobble-based tools, and flexed human burials. While groundstone tools and scrapers are the most recognized tool types, coastal Encinitas Tradition sites also contain numerous utilized flakes, which may have been used to pry open shellfish. Artifact assemblages at coastal sites indicate a subsistence pattern focused on shellfish collection and near-shore fishing, suggesting an incipient maritime adaptation with regional similarities to more northern sites of the same period. Other artifacts associated with Encinitas Tradition sites include stone bowls, doughnut stones, discoidals, stone balls, and stone, bone, and shell beads.

By 5,000 ybp, an inland expression of the La Jolla Complex, which exhibits influences from the Campbell Tradition from the north, is evident in the archaeological record. These inland Millingstone Horizon sites have been termed "Pauma Complex." By definition, Pauma Complex sites share a predominance of grinding implements (manos and metates), lack mollusk remains, have a greater tool variety (including atlatl dart points, quarry-based tools, and crescentics), and seem to express a more sedentary lifestyle with a subsistence economy based on the use of a broad variety of terrestrial resources. Although originally viewed as a separate culture from the coastal La Jolla Complex, it appears that these inland sites may be part of a subsistence and settlement system utilized by the coastal people.

Late Prehistoric Period

The Late Prehistoric period, sometimes referred to as San Luis Rey I and II, begins approximately 1,300 ybp. Cremation, ceramics, bow and arrow, small triangular points, the use of Obsidian Butte obsidian, and the reliance upon the acorn as a main food staple are the defining characteristics of the Late Prehistoric period. These characteristics are thought to represent the movement of Shoshonean speaking groups into northern San Diego, Orange, Riverside, and Los Angeles Counties. Economic systems diversified and intensified during this period with the continued elaboration of trade networks, cremation of the dead, the use of shell-bead currency, and the appearance of more labor-intensive, but effective, milling technologies such as the bedrock mortar for use in acorn processing.

Ethnographic Period

The ethnographic period begins with the Hispanic intrusion into southern California and the founding of the Mission San Juan Capistrano, located near the Lake Forest area, in 1776. Ethnohistorical and ethnographic evidence indicates that three Shoshonean-speaking groups that occupied the southern and eastern portions of Orange County were the Luiseño, Gabrielino, and the Acjachemem (Juaneño), each culturally similar but possessing slight dialectic differences. Along the coast, the groups made use of the marine resources available by fishing and collecting mollusks for food. Seasonally available terrestrial resources, including acorns and game, were also sources of nourishment for these groups. The elaborate kinship and clan systems between these groups facilitated a wide-reaching trade network that included trade of Obsidian Butte obsidian, resources from the eastern deserts, and steatite from the Channel Islands. Some notable differences can be seen in the material culture between the three groups. For example, the Gabrielino used containers made from steatite, which is a soapstone material from the Santa Catalina Islands, instead of pottery, which was the preferred material for the Juaneño and the Luiseño.

The Luiseño, Gabrielino, and Juaneño occupied sedentary villages most often located in sheltered areas in valley bottoms, along streams, or along coastal strands near mountain ranges. Villages were located near water sources to facilitate acorn leaching, and in areas that offered thermal and defensive protection. Villages were composed of areas that were both publicly and privately, or family, owned. Publicly owned areas included trails, temporary campsites, hunting areas, and quarry sites. Inland groups had fishing and gathering sites along the coast that were utilized, particularly from January to March, when inland food resources were scarce. During October and November, most of the village would relocate to mountain oak groves to harvest acorns. For the remainder of the year, most would remain at the village sites, where food resources were within a day's travel.

The Aliso Creek watershed, located just to the south and east of the project site, has been reported to be the ethnohistoric boundary between the Luiseño, Gabrielino, and Juaneño. The Gabrielino occupied territory northwest of Aliso Creek, the Juaneño occupied territory to the south, and the Luiseño occupied territory to the southeast and east. However, there are also reports that the boundary is located further north, and marked by the Santa Ana River.

Historic Period

The historic period begins July 16, 1769, when the first Spanish exploring party commanded by Gaspar de Portolá (with Father Junípero Serra in charge of religious conversion of the native populations) arrived in San Diego to secure California for the Spanish Crown. The natural attraction of the harbor at San Diego and the establishment of a military presence in the area solidified the importance of San Diego to the Spanish colonization of the region and the growth of the civilian population. Missions were constructed from San Diego to as far north as San Francisco. The mission locations were based on a number of important territorial, military, and religious considerations. Grants of land to persons who made an application were made, but many tracts reverted to the government for lack of use. As an extension of territorial control by the Spanish empire, each mission was placed so as to command as much territory and as large a population as possible. Mission San Juan Capistrano, located near the Lake Forest area, exerted much influence over the Acjachemem (Juaneño), who either adapted to mission life, rebelled and ran away, or died from European disease. While primary access to California during the Spanish Period was by sea, the route of El Camino Real served as the land route for transportation, commercial, and military activities. This route was considered to be the most direct path between the missions. As increasing numbers of Spanish and Mexican people, and later Americans during the Gold Rush, settled in the area, the Native populations diminished as they were displaced or decimated by disease.

The Rancho Period represents the time between 1821 and 1848. By 1821, Mexico had gained independence from Spain, and the northern territories were subject to political repercussions. By 1834, all of the mission lands had been removed from the control of the Franciscan Order under the Acts of Secularization. Without proper maintenance, the missions quickly began to disintegrate, and after 1836, missionaries ceased to make regular visits inland to minister the needs of the native peoples. The Mexican government granted large tracts of land to persons who applied for them or had gained favor with the Mexican government. Grants of land were also made to settle government debts. Numerous Mexican land tracts, or rancheros, were established throughout coastal and interior California. Jose Serrano was granted the 10,668-acre Rancho Cañada de Los Alisos in 1842, which encompassed most of the present-day community of Lake Forest.

California was invaded by United States troops during the Mexican-American War of 1846-1848. The acquisition of strategic Pacific ports and California land was one of the principal objectives of the war. At the time, the inhabitants of California were practically defenseless, and they quickly surrendered to the United States Navy in July 1847.

In 1848, the Treaty of Guadalupe Hidalgo gave sovereignty over Alta California, New Mexico, and Arizona to the United States, and thus began the American Settlement Period. The new colonial order soon seized power in California with disastrous results for the native people. European control over Alta California had been concentrated along the coast, but with the great influx of American colonists seeking land and mineral resources, the inland became more populated and native populations were displaced from more of their lands. Conflicts between the Indians and the intruding white colonists led to the establishment of reservations for some villages by executive order.

The cattle ranchers of the "counties" of southern California had prospered during the cattle boom of the early 1850s. Cattle raising soon declined, contributing to the expansion of agriculture. The completion of the transcontinental railroad in 1869 encouraged developers, land speculators, and colonists to invest and live in southern California. Orange County's economy changed from stock raising to farming, and growing grain or citrus crops replaced the raising of cattle in many of the county's inland valleys.

Dwight Whiting purchased most of Jose Serrano's Rancho Cañada de Los Alisos, which comprises most of the present-day Lake Forest area after the United State government took control of California and terminated the rancho system. Whiting introduced dry farming, citrus farming, and later citrus production. As a result, the town of El Toro developed as a shipping, commerce, and social center. Eucalyptus groves, a prominent feature of the Lake Forest landscape, were planted by Whiting for construction wood and still exist today as a reminder of Whiting's past endeavors. The town did not grow substantially until an imported water infrastructure was extended to the area in the 1960s. During the 1970s, a number of planned communities were developed under County jurisdiction with several created lakes. The City of Lake Forest was incorporated in 1991. Of more than 20,000 residences in the City, six were built before 1940. None of these residences are located on the project site.

GEOLOGY AND STRATIGRAPHY

Geology

Geologically, the project site is located in the foothills of the southern Santa Ana Mountains within a southwestwardly dipping sequence of Tertiary sedimentary rocks that range in age from Eocene-Oligocene to early Pliocene. The Cristianitos Fault, an important high-angle normal fault, parallels the western side of the project area and juxtaposes younger and older sedimentary formations.

Stratigraphy

The Tertiary sediments exposed within the project area are assigned to the following geologic formations, from youngest to oldest: the lower Pliocene Oso Sand Member of the Capistrano Formation (Tco), the upper Miocene Puente Formation, including the siltstone (Tpst) and sandstone (Tps) submembers of the Soquel Member, and the underlying La Vida (Tplv) Member, and the middle Miocene Topanga Formation (Tt). The Oso Sand is present only as a very narrow sliver along the southwest margin of the project area, representing the formational sediments present on the western, downthrown side of the north-northwest trending Cristianitos Fault, which roughly parallels the western project boundary. Most of the project area is composed of Puente Formation siltstone (Tpst), sandstone (Tps), and shale (Tplv). Tiny outcrops of the Topanga Formation (Tt) may be present at the far eastern end of the project area. Based on their contained fossils, the exposures of the Soquel Member (sandstone submember) of the Puente Formation represent a shallow-water marine sedimentary environment, whereas the La Vida Member and the siltstone submember of the Soquel Member of the Puente Formation represent a moderately deeper-water marine environment.

Also mapped within the project area are Quaternary landslides (Qls), slope wash (Qsw), fluvial terrace deposits (Qtr) and alluvium (Qal). Landslides are only common along dip slopes in the softer sediments of the La Vida Member and the siltstone submember of the Soquel Member of the Puente Formation, which are similar to the westward topographic slopes across the project site. Grading and earthmoving activities in recent years have resulted in most of the northwest part of the project site west of Saddleback Ranch Road being covered with engineered fill materials, as has the western part of the area east of Saddleback Ranch Road. Fill materials, consisting of both engineered and undocumented materials, cover much of the area south of Glenn Ranch Road between the two main topographic highs that have been partly cut away by the roadway of Glenn Ranch Road.

PALEONTOLOGY

Paleontological Sensitivity

The sedimentary formations exposed within, or closely adjacent to, the project site are the Oso Sand Member of the Capistrano Formation, the Puente Formation, which is divided into three members and submembers (siltstone and sandstone submembers of the Soquel Member, and the underlying La Vida Member), and the Topanga Formation. The Oso Sand Member is accorded a "very high" paleontologic sensitivity, but may be present only as a tiny sliver along the Cristianitos Fault on the west side of the project site. The three members or submembers of the Puente Formation, which make up almost all of the exposed outcrop areas within the project site, are accorded a "high" paleontologic sensitivity. The Topanga Formation is also accorded a "very high" sensitivity, but may be present at only a very few isolated small outcrop areas at the very eastern end of the project site. Non-marine (fluvial) terrace deposits (Qtr) are also accorded a "high" paleontologic sensitivity. Geologically, young surficial sediments mapped within the project area include Quaternary alluvium (Qal), slope wash (Qsw), and landslide deposits (Qls), but none of these types of deposits is regarded as having paleontologic sensitivity. However, because landslide deposits within any formational terrain will contain the same sorts of fossils as found in adjacent nondisturbed areas of the formation, they are regarded herein as having the same paleontologic sensitivity. The different lithologies of the Puente Formation members and submembers are distinct enough to be readily distinguished within any mapped landslide deposit. Landslide deposits within the project area are treated herein the same as in situ exposures of the formation; refer to Figures 4 and 5 of the Paleontological Resource Assessment located in Appendix 11.2.

CULTURAL RESOURCE RECORDS SEARCH

The Cultural Resources Study included a cultural resource records search from the South Central Coastal Information Center (SCCIC) in order to determine if any known archaeological sites, historic structure locations, or other cultural resources are present in or adjacent to the project site. The Cultural Resources Study also requested that the Native American Heritage Commission (NAHC) conduct a search of its Sacred Lands File to determine if cultural resources important to Native Americans have been recorded within the project area.

Results and Findings

The archaeological records search results from SCCIC showed that 22 previous surveys have been conducted within one mile of the property, of which 11 involved the project site. The records search also showed that five prehistoric cultural resources have been recorded within the project boundaries (Sites ORA-441, ORA 442, ORA-443, ORA-445, and ORA-446). Additionally, more than 50 previously recorded prehistoric cultural resources and at least three historic resources are located within one mile of the project site. The prehistoric sites primarily consist of artifact scatters containing groundstone tools, flakes, and precision tools, as well as numerous sites that also contain midden soil, scrapers, cores, and hammerstones.

ORA-441

Site ORA-441 was first described in 1973 as a prehistoric midden deposit and artifact scatter with groundstone tools, choppers, scrapers, cores, hammerstones, and at least one feature consisting of a rock cairn measuring five meters in diameter. The site was reported as being situated on a moderately sloping south-facing slope between 970 to 1,000 feet above mean sea level (amsl), and measuring approximately 200 by 150 meters. The soil within the site was noted as a medium-gray loamy midden, and the native soil was a very light-tan sandy alluvium. Vegetation consisted of a native coastal sage scrub plant community, various cacti, and grasses. No disturbances were noted within the site area.

The site was surveyed in 1977 for the Glenn Ranch development project, and several rock cairns were noted as being associated with the site. In 1980, the site was revisited and described as being located on a low ridge, with four rock cairns, one of which contained fire-cracked rock and groundstone fragments. The site area measured 100 by 75 meters, and contained hammerstones and flakes. The site was described again in a 1986 report for The Baldwin Company as a scatter of artifacts and chipping waste. No testing of the site was conducted.

ORA-442

Site ORA-442 was first described in 1973 as an artifact scatter with groundstone tools, scrapers, and cores. The site was reported as being situated on a low knoll between 960 to 1,000 feet amsl; however, the site area was not defined. The native soil was noted as a gray/tan sandy alluvium, and no midden soil was reported. Vegetation consisted of a native coastal sage scrub plant community, various cacti, and grasses. No disturbances were noted within the site area.

The site was mentioned in a site survey letter report for the El Toro Road realignment, dated 1975. The site was grouped with ORA-443; together they were described as "secondary seasonal gathering camps." The site was surveyed in 1977 for the Glenn Ranch development project, and described as "a thick scatter of artifacts and chipping waste covering an ill-defined area of unknown depth." The site was reported as having been disked. In 1980, the site was revisited and described as being located on an east-facing slope of a low ridge, with a dense lithic scatter, manos, metate fragments, hammerstones, and numerous water-worn cobbles covering an area measuring 40 by 50 meters. Four rock clusters were observed on the west-facing slope of the same ridge, but it was not determined if they were natural or cultural. The site was described again in a 1986 report for The Baldwin Company as a thick scatter of artifacts and chipping waste. No testing of the site was conducted.

ORA-443

Site ORA-443 was first described in 1973 as an artifact scatter with groundstone tools, scrapers, scraper planes, and hammerstones. The site was reported as being situated within a drainage that opens up to the south and drains into Aliso Creek. The site was reported as being situated at approximately 1,150 feet amsl, and extending south to approximately the 1,050-foot level. The site measured 180 by 300 meters. One feature was noted and described as a rock grouping. The native soil was noted as a gray/tan sandy alluvium, and no midden soil was reported. Vegetation consisted of a native coastal sage scrub plant community, various cacti, and grasses. No disturbances were noted within the site area.

The site was mentioned in a site survey letter report for the El Toro Road Realignment, dated 1975. The site was grouped with ORA-442, and together they were described as "secondary seasonal gathering camps." The site was surveyed in 1977 for the Glenn Ranch development project and described as being located along the west side of a ridge, with scrapers, scraper planes, hammerstones, and manos in the 180 by 300 meter area. The artifact scatter was reported as appearing thin and shallow. In 1980, the site was revisited and described as a being located on a west- and south-facing slope of a ridge, and appeared to have been disturbed by erosion. Three manos, a metate fragment, two cores, and two small clusters of stones were observed in a 30 by 50 meter area. The site was described again in a 1986 report for The Baldwin Company as containing manos, scrapers, scraper planes, and hammerstones. No testing of the site was conducted.

ORA-445

Site ORA-445 was first described in 1973 as an artifact scatter with groundstone tools, mortar bowl fragments, and fire-cracked rock. The site was reported as being situated on a low hill and extending eastward to a creek terrace. The site elevation was approximately 950 feet amsl and measured 200 by 160 meters. No features were observed. The native soil was noted as being a light tan sandy alluvium that "grades into a gray loam on the stream terrace to the east." Midden soil was predicted to exist below the erosional deposition from the hill, and may also be below the surface on top of the hill. Vegetation consisted of a native coastal sage scrub plant community, various cacti, and grasses. No disturbances were noted within the site area.

The site was surveyed in 1977 for the Glenn Ranch development project, and described as being located on a knoll and on an adjacent stream terrace, with manos, mortar bowl fragments, and fire-cracked rock in a 200 by 160 meter area. The survey reported that some of the midden from the top of the knoll may have eroded, and possibly overlaps the midden on the lower terrace. In 1980, the site was revisited and described as being located on a knoll and east-facing terrace. The distribution of artifacts, consisting of manos, flakes, and hammerstones, indicated that the site measured 50 by 75 meters. The site was described again in a 1986 report for The Baldwin Company as containing manos, fire-cracked rock, and mortar bowl fragments. No testing of the site was conducted.

ORA-446

Site ORA-446 was first described in 1973 as an artifact scatter with manos, scrapers, and cores. The site was reported as being situated on top of a knoll and a road was cut into the western side of the site area. The site elevation was approximately 1,150 feet amsl and measured 100 by 200 meters.

No features or midden soil were reported. The native soil was noted as being a light gray/tan sandy alluvium. Vegetation consisted of a native coastal sage scrub plant community, various cacti, and grasses. The road cut was the only disturbance to the site reported, which resulted in the exposure of artifact materials.

The site was surveyed in 1977 for the Glenn Ranch development project, which reported that artifact materials were visible in the road cut and also revealed a "middle depth" of 40 to 60 centimeters. The site area was estimated to measure 100 by 200 meters, and the site was described as situated on a narrow knoll adjacent to a tributary of Serrano Creek. The artifacts included manos, scrapers, and cores. In 1980 the site was revisited during a survey, which also reported that artifacts were eroding out of the road cut. This survey could not determine the areal extent of the site due to vegetation; however, the portion of the site exposed in the road extended for approximately 25 meters. Artifacts observed included mano fragments and flakes. The site was described again in a 1986 report for The Baldwin Company as producing manos, scrapers, and cores. No testing of the site was conducted.

Native American Consultation

The Sacred Lands File records search by the NAHC was negative for the presence of sacred or ceremonial sites or landforms considered important to local tribes. Further, the analysis of site components indicated no identifiable Native American religious, ritual, or other special activities at the project site.

CULTURAL RESOURCES SURVEY

Methodology

Field Methods

The most recent and comprehensive archaeological survey of the property was conducted on August 3 through 4, 2011. The intensive pedestrian survey included a series of parallel transects, spaced at approximately five to 10 meter intervals, as appropriate. The entire project area was included in the survey process. Photographs were taken to document project conditions during the survey; refer to the Cultural Resource Study located in Appendix 11.2. Ground visibility throughout the property was moderate, with recently cut ground cover. In addition, all rodent spoil piles and alluvial cuts were closely inspected for evidence of archaeological materials. With the exception of steep slope in the southern portion of the project area, no constraints were encountered during the field survey.

Testing included re-recording each resource through photographs, the creation of maps by global positioning system (GPS), a surface collection of prehistoric artifacts, and subsurface excavations with shovel test pits and one-meter-square test units. The purpose of the excavations was to find the boundaries and overall depth of each site based on the presence or absence of subsurface artifacts and/or culturally modified soil. The test unit and shovel test pits were excavated using hand tools, and vertical control within the units was maintained by excavating in standard decimeter levels. The shovel test series consisted of 30 by 30 centimeter excavations, which proceeded in decimeter levels to subsoil or a culturally sterile soil horizon. The test units were also excavated to a

culturally sterile level. The placement of the test units was based on the shovel test recoveries. All excavated soils were sifted through one-eighth-inch hardwire mesh screens. All of the artifacts recovered from the excavations were bagged, labeled with provenience information, and returned to the laboratory for analysis. Level record sheets were completed after the excavation of each shovel test pit or test units level, describing the soil types encountered and the materials recovered. All surface collections, shovel tests, and the test unit were mapped using a Trimble GeoXT GPS unit equipped with TerraSync software. Photographs were taken to document field conditions during the testing phase.

Laboratory Methods

Cultural material recovered from the testing programs at Sites ORA-441, -442, -443, -445, and -446 was returned to the laboratory for cataloging, identification, analysis, repackaging, and curation in keeping with generally accepted archaeological procedures. Comparative collections curated in the laboratory are often helpful in identifying the unusual or highly fragmentary specimens. The cataloging process for the recovered specimens utilized a classification system commonly employed in this region. After cataloging and identification, the collections were marked with the appropriate provenience and catalog information, and then packaged for permanent curation. No radiocarbon dating or other specialized studies were conducted.

Results

The project site had been previously studied in 1973, 1977, 1980, and 1986 as part of broader studies for the Portola Hills Community. The survey process from the previous projects was duplicated in order to ensure all resources were identified. For those sites previously recorded, the 2007 study focused upon the evaluation of the sites and an assessment of potential impacts from proposed development. A significance evaluation was conducted from January 24 through 29, 2007. The significance evaluation included a surface collection and subsurface excavations with shovel test pits and test units, which were predominantly negative for the presence of subsurface artifacts or culturally modified soil. Site records were updated to reflect the results of the testing program. Cultural resources were identified within the project site including sites CA-ORA-441, CA-ORA-442, CA-ORA-443, CA-ORA-445, and CA-ORA-446; refer to the Cultural Resources Study located in Appendix 11.2 for detailed descriptions of the results of the field investigations and testing.

In August 2011, the entire northern portion of the project site was resurveyed to verify the results of previous studies. Overall, a high amount of waist-high brush and dense grasses and weeds across all project alignments resulted in moderate to poor ground visibility (approximately 50 to 35 percent). The graded portions of the properties (dirt roads and pads) contained less dense ground coverage (permitting from 95 to 70 percent ground visibility). Those portions of the properties with drainages and areas of relatively flat land were intensively surveyed using five to 10 meter transects depending on the terrain. All of the previously recorded sites were relocated. However, no additional cultural resources (features, soils, or artifacts) were identified within the boundaries of the project site. The drainages, animal burrow backdirt, and areas of native vegetation were all closely inspected for evidence of prehistoric activity with none observed.

ORA-441

Site ORA-441 was recorded as a marine shell and artifact scatter on a south-facing slope between 990 to 1,060 feet amsl, measuring 108 by 35 meters. The site is centrally located on the western property boundary, approximately 400 meters due south of the Glenn Ranch Road and Saddleback Ranch Road intersection. No evidence remains of the four cairns observed during previous surveys, and no additional features were observed. Vegetation within the area consists of a native coastal sage scrub plant community, various cacti, and grasses. Disturbances noted within the site area include disking on the ridge top and an artificial cut made in part of the drainage to the west of the site. The previous disking has removed most of the native vegetation, and appears to have removed the previously identified rock cairns.

Surface Recovery

The surface collection resulted in the recovery of 6.7 grams of shell and one piece of debitage.[1] The piece of debitage was recovered from the side of the hill. The shell was recovered from the bottom of the hill, next to the drainage. None of the artifacts reported in the 1973 site record were observed. There was no indication from any of the previous reports that the artifacts were collected during previous surveys, indicating that the artifacts were collected but not documented, or they were removed as a result of disking and other modern activities within the site area.

Subsurface Excavation

Eleven shovel test pits were excavated at the site. The shovel test pits were placed between the shell scatter near the seasonal drainage and the surface collection near the top of the hill. All shovel test pits were excavated to 30 centimeters, with the exception of shovel test pit 4 and shovel test pit 11, which were excavated to 50 centimeters. No artifacts were recovered and no culturally modified soil was observed.

One standard one-meter-square test unit was excavated to 30 centimeters. The test unit was placed in the area where shell was observed on the surface. One shell fragment was recovered within the first 10 centimeters, and two shell fragments were recovered within the 10 to 20 centimeter level. A soil change was noted at 10 centimeters near the west wall of the unit, and at 20 centimeters for the majority of the unit. The top layer of soil was noted as a medium-gray sandy loam, and the lower layer of soil is a medium-gray/tan sandy alluvium. At the lower level, the soil did not change color, but it became much more compacted, and the sand was less coarse in size/texture.

Laboratory Analysis

As stated, shell and one piece of debitage were recovered at the site. The single piece of debitage falls under the category of lithic production waste. Debitage consists of lithic production waste specimens that lack specific attributes of tools, cores, or flakes. Although the term debitage has been used to describe all waste products that result from flintknapping, its use here is limited to angular waste fragments, sometimes referred to as shatter, which may also result from use of

[1] Debitage refers to all the waste material produced during lithic reduction and the production of chipped stone tools. This assemblage includes, but is not limited to, different kinds of lithic flakes, shatter, and production errors and rejects.

percussion tools, particularly the sharpening of groundstone tools with hammerstones, and resharpening the edges of hammerstones dulled during sharpening of groundstone tools. The lithic material category for the single piece of debitage is medium-grained metavolcanic, most likely sourced locally. The debitage exhibited use patterns typical of shatter from tool production; a single point of percussion and sharp, angular edges. Lithic production waste made from metavolcanic materials is in keeping with the abundance of these materials in the region and the preference to use these materials for tools.

Discussion

Due to the lack of artifacts observed on the surface despite the excellent ground visibility and the absence of a subsurface cultural deposit, it appears that Site ORA-441 was a temporary or seasonal resource extraction and processing site that lacks any information that might reflect focused or long-term use. The rock cairns listed in the 1973 site form were once believed to indicate the presence of human burials; however, no evidence of human remains was observed during previous surveys, or during the present field investigation. The subsurface excavations combined with the collection and curation of surface artifacts and recordation of the site has exhausted the research potential for Site ORA-441.

ORA-442

Site ORA-442 was recorded during the current field investigation as an artifact scatter located on a southwest-facing slope between 960 to 1,060 feet amsl and measuring 198 by 54 meters. The site was relocated at the southwest corner of the subject property, just northwest of Aliso Creek and El Toro Road, 600 meters southwest of Glenn Ranch Road. Vegetation in the site vicinity consists of a native coastal sage scrub plant community, various cacti, and grasses. Dark, midden-like soil was observed on the slope, but within an area that has been disked for many years. The soil is most likely not culturally modified other than being altered by years of agricultural use. The site has been disturbed by disking, which has removed all of the native vegetation within the site.

Surface Recovery

The surface collection resulted in the recovery of five lithic production waste flakes (one Monterey chert, one chalcedony, one quartzite, and two medium-grained metavolcanic), two scrapers, one cobble scraper, one piece of debitage, one mano, and one core.

Subsurface Excavation

Eleven shovel test pits were placed within and just beyond the surface scatter of artifacts. All shovel test pits were excavated to 30 centimeters except for shovel test pit 1 and shovel test pit 2, which went to 40 and 50 centimeters, respectively. The diameter of each averaged about 30 centimeters. No prehistoric artifacts were recovered and no culturally modified soil was observed.

One standard one-meter-square test unit was excavated to a depth of 30 centimeters. No artifacts or culturally modified soil were observed during the test unit excavation; however, a soil change was noted between 12 and 25 centimeters below the surface. The native soil is a medium gray/tan sandy loam, which became more compacted in the lower level. Since no artifacts were recovered and no

culturally modified soil was observed, the results of the subsurface excavations indicate that there is no subsurface component to the site.

Laboratory Analysis

A total of 11 artifacts were recovered from the surface at Site ORA-442. The artifact assemblage consisted of five lithic production waste flakes (one Monterey chert, one chalcedony, one quartzite, and two medium-grained metavolcanic), three scrapers, one piece of debitage, one mano, and one core. The cobble scraper and one additional scraper were made from quartzite; the remaining artifacts were made from medium-grained metavolcanic.

The groundstone tool recovered from the site consisted of a mano that was measured, weighed, and analyzed for groundstone characteristics and material type. The lithic material category for the mano is medium-grained metavolcanic, it weighs 664.0 grams, and measures 13 by nine by five centimeters. Metavolcanic materials are abundant in the region and the preferred material to use for tools. The mano recovered from the site appears to have been used lightly on one side, and fire affected/burned.

The lithic production waste recovered from the site consisted of one core, five flakes, and one piece of debitage. Cores are typically rocks from which percussive flakes have been struck. The critical element in this classification is that the resultant flakes, not the source, are the objects of percussive activity. While the manufacture of most lithic tools requires flaking, the core is simply a source for potentially usable flakes. Other tools may exhibit core-like percussive edge preparation and therefore incorporate the term "core" in their nomenclature (e.g., core/scraper); however, the classification of core was reserved for those objects that were used as sources of flakes. The lithic material category for the core recovered from the site is medium-grained metavolcanic, which was most likely sourced locally.

Flakes typically consist of flaked lithic material that exhibits specific attributes that are the result of flake-producing activities. Flakes exhibited a platform, a bulb of percussion, and force lines and rings, among other attributes. The lithic material categories for the flakes recovered at the site include chalcedony, Monterey chert, quartzite, and medium-grained metavolcanic. Medium-grained metavolcanic flakes indicate that some tool manufacturing occurred locally or at the site. Materials such as Monterey chert and chalcedony are also locally sourced materials; however, more specialized materials such as certain types of chert and obsidian (although no obsidian was recovered at the site) indicate that the local inhabitants traded raw materials with surrounding populations for the production of tools.

The lithic material categories for the single piece of debitage recovered from the site is medium-grained metavolcanic, most likely sourced locally. The debitage exhibited use patterns typical of shatter from tool production, a single point of percussion and sharp, angular edges with no visible cortex.

The unifacial precision tools recovered from the site consisted of three scrapers. Scrapers include unifacial tools that were used to scrape, cut, or flense wood, flesh, or other fibrous materials. The scrapers recovered from the site were divided into three different types based on the morphological form of the tool, usually derived from the characteristics of the utilized edges. One scraper is a

cobble scraper that was derived from a cobble split along its length and width, with one utilized edge that also has a perforator; the second scraper is a split cobble scraper that was reduced to a very large flake with one percussion bulb and two reworked edges; and the third scraper is a large spall scraper that has a slightly utilized edge. The materials used to produce the tools consist of quartzite and medium-grained metavolcanic, most likely sourced locally. The scrapers do not exhibit signs of extensive use; rather, they appear to have been utilized lightly, with little retouching or re-flaking of the edges. The split cobble scraper exhibited the most retouching of the three scrapers.

Discussion

It appears that Site ORA-442 was a temporary or seasonal resource extraction, processing, and perhaps, tool production and maintenance site. The groundstone tools indicate that seed grinding activities took place at the site. The site lacks information that might reflect long-term use. The subsurface excavations combined with the collection and curation of surface artifacts and the recordation of the site have exhausted the research potential for Site ORA-442.

ORA-443

Site ORA-443 was recorded as an artifact scatter with groundstone tools situated within a drainage that opens up to the south and drains into Aliso Creek. The site is centrally located near the southeast property boundary, just south of Glenn Ranch Road, and approximately 100 meters northwest of El Toro Road and Aliso Creek. The site measures approximately 54 by 180 meters and extends south from the top of a knoll at approximately 1,180 feet amsl to approximately the 1,050-foot level. No features were observed, including the rock grouping reported in the 1973 site record. No midden soil was observed. Vegetation consists of a native coastal sage scrub plant community, various cacti, and grasses. The site area did not appear to be disturbed other than from natural erosion within the drainage.

Surface Recovery

The surface collection resulted in the recovery of four lithic production waste flakes (two Monterey chert and two medium-grained metavolcanic), two pieces of debitage, and five manos. The majority of the surface collections originated from the top of the hill at the north end of the site.

Subsurface Excavation

Fifteen shovel test pits were placed within and just beyond the surface scatter of artifacts. All shovel test pits were excavated to 30 centimeters, and the diameter of each averaged about 30 centimeters. No artifacts were recovered and no culturally modified soil was observed.

One standard one-meter-square test unit was excavated to a depth of 30 centimeters. No artifacts or culturally modified soil was observed during the test unit excavation; however, a soil change was noted around 20 to 25 centimeters below the surface. The soil changed color slightly, from a dark gray sandy loam to a lighter grayish tan; it also became much more compacted at the lower level, and the sand was less coarse in size and texture. Although the soil appeared darker on the surface, this is most likely due to natural processes such as the decomposition of organic debris, which forms a loamy topsoil. There was no evidence that the topsoil was culturally modified, or contained cultural

constituents such as shellfish remains. The placement of the test unit was based on the potential for the site to contain a subsurface deposit, which was higher within the eastern portion of the site area where the terrain was considerably flatter and more level than the western portion of the site, which contained more surface artifacts, but was sloped and rocky. Since no artifacts were recovered and no culturally modified soil was observed, the results of the subsurface excavations indicate that there is no subsurface component to the site.

Laboratory Analysis

A total of 11 artifacts were recovered from Site ORA-443. The artifact assemblage consisted of four lithic production waste flakes (two Monterey chert and two medium-grained metavolcanic), two pieces of debitage (medium-grained metavolcanic and Monterey chert), and five manos. The lithic material categories for the five manos include granite, quartzite, and coarse-grained metavolcanic, which can be found locally.

The groundstone tools recovered from the site were measured, weighed, and analyzed for groundstone characteristics and material type. The weights range from 54.9 to 765.2 grams.

Four of the five manos recovered from the site exhibit use-wear on primarily one surface. Use-wear often forms noticeable striations along the used surface, creating an artificial shoulder between the grinding surface and the side of the mano. The fifth mano appears to have been used on both sides. The manos appear to have been used moderately, and were fragmented and fire-affected as a result of burning.

The lithic production waste consisted of four flakes and two pieces of debitage. The lithic material categories for the lithic production waste recovered at the site includes Monterey chert and medium-grained metavolcanic. Medium-grained metavolcanic can be sourced locally, and the Monterey chert also appears to be a local material. Very fine-grained metavolcanics, such as chert, were highly valued due to their flaking characteristics, which allow for very sharp, precise edges. The flakes are mostly primary and secondary flakes, which have cortex on some of the surfaces. The debitage exhibited use patterns typical of shatter from tool production (one or two points of percussion and sharp, angular edges with no cortex).

Discussion

It appears that Site ORA-443 was a temporary or seasonal resource extraction, processing, and perhaps, a tool production and maintenance site that utilized both local and imported materials in the production of stone tools, and where the grinding of seeds and/or acorns also occurred. Although the ground visibility was fair to good, the site lacks information that might reflect long-term use. The subsurface excavations, combined with the collection and curation of surface artifacts and recordation of the site, has exhausted the research potential for Site ORA-443.

ORA-445

Site ORA-445 is disturbed, evidenced by the presence of concrete and modern trash, which covers the entire site area. Site ORA-445 was relocated during the current field investigation near the western property boundary, south of Glenn Ranch Road, and approximately 50 meters southwest of

the Saddleback Ranch Road and Glenn Ranch Road intersection. The site boundaries could not be accurately defined because of the disturbances and lack of surface artifacts; however, the testing covered an area that measured approximately 72 by 108 meters, between 920 and 960 feet amsl. No artifacts, midden soil, or features were observed on the surface. A concrete drainage ditch running north/south has impacted the west side of the site, and the northeast end of the site area has been graded for a road. Vegetation within the area consists of a native coastal sage scrub plant community, various cacti, and grasses.

Surface Recovery

No artifacts were observed on the surface, including those previously reported. It appears that disturbances to the site have removed all the previously recorded artifacts.

Subsurface Excavation

Five shovel test pits were placed within the previously mapped site area. All shovel test pits were excavated to 30 centimeters, and the diameter of each averaged about 30 centimeters. The soil is a grayish tan sandy loam. No artifacts were recovered and no culturally modified soil was observed. Since no artifacts were recovered and no culturally modified soil was observed, the results of the subsurface excavations indicate that there is no subsurface component to the site.

Laboratory Analysis

No artifacts were recovered; therefore, laboratory analysis was not conducted.

Discussion

It appears from the results of the records search that Site ORA-445 was a temporary or seasonal resource extraction and processing site, which utilized the stream to the east, and where the grinding of seeds and/or acorns also occurred. From past descriptions of the size of the site, and the reported presence of midden soil, the site may have been used more frequently than the other resources within the project area. The results of the current field investigation, however, lack any information that might reflect focused or long-term use. The subsurface excavations and recordation of the site has exhausted the research potential for Site ORA-445.

ORA-446

Site ORA-446 was recorded as an artifact scatter with lithic production waste situated on top of a knoll between approximately 1,060 and 1,100 feet amsl, and measuring approximately 58 by 49 meters, although this was difficult to determine due to the disturbances at the site. The site is located along the western property boundary, 200 meters north of Glenn Ranch Road, and approximately 200 meters due west of Millwood Road. A dirt road borders the western half of the site. Additionally, the majority of the site area appeared graded. The knoll has been flattened, and most of the topsoil has been pushed down slope to the east. There were cement drainage ditches on the east and west slopes below the site as well. No features or midden soil were observed. Vegetation consists of a native coastal sage scrub plant community, various cacti, and grasses outside of the extensively graded area.

Surface Recovery

The surface collection resulted in the recovery of four lithic production waste flakes (two quartzite and two medium-grained metavolcanic). The surface collections originated from the top of the hill, at the north end of the site.

Subsurface Excavation

Eight shovel test pits were placed within and just beyond the surface scatter of artifacts, as well as along the side of the road where artifacts were observed eroding out of the road cut. All shovel test pits were excavated to 30 centimeters, and the diameter of each averaged about 30 centimeters. No artifacts were recovered and no culturally modified soil was observed.

One standard one-meter-square test unit was excavated to a depth of 30 centimeters. No artifacts or culturally modified soil was observed during the test unit excavation, and the soil, which is a grayish tan compacted sandy and gravely loam, remained unchanged throughout the decimeter levels. Since no artifacts were recovered and no culturally modified soil was observed, the results of the subsurface excavation data verified that no subsurface component is present at the site.

Laboratory Analysis

A total of four artifacts were recovered from ORA-446. The artifact assemblage consisted of four lithic production waste flakes (two quartzite and two medium-grained metavolcanic).

The lithic production waste consisted of four flakes that exhibited a platform, a bulb of percussion, and force lines and rings, among other attributes. The lithic material category for the flakes is medium-grained metavolcanic, most likely found locally.

Discussion

Due to the minimal number of artifacts observed on the surface despite excellent ground visibility and the absence of a subsurface cultural deposit, it appears that the Site ORA-446 was a temporary or seasonal resource extraction and processing site that lacks any information that might reflect focused or long-term use. The subsurface excavations and recordation of the site has exhausted the research potential for Site ORA-446.

PALEONTOLOGICAL RESOURCE RECORDS SEARCH

Results and Findings

Previously Recorded Fossil Localities

Paleontologically, all of the Tertiary sedimentary formations within the project boundaries have yielded marine fossils, either on the subject property or in nearby exposures. Recorded fossil localities in the published literature, or in informally prepared paleontologic assessment or monitoring and mitigation reports are more numerous in those areas that have been monitored paleontologically during grading and earthmoving activities associated with site preparations than

they are in areas that have not been assessed or monitored. Fossils vary in size from microscopic single-celled organisms (foraminifera and diatoms) to large marine mammals (e.g., whales).

Fossil types that have been recovered from local exposures of the Oso Sand Member of the Capistrano Formation in Oso Creek, Aliso Creek and Serrano Creek drainages, but outside of the project boundary, include abundant remains of both cartilaginous fish (e.g., large shark teeth) and bony fish, as well as marine birds and marine mammals (e.g., baleen and toothed whales, dolphins and sea lions). Although fossils were not reported regarding Glenn Ranch, both shark and marine mammal remains from two localities within the original Portola Center property were reported on the adjacent Whiting Ranch. The Soquel Member of the Puente Formation has yielded several fossiliferous horizons in the nearby Foothill Ranch area containing marine mammals, marine crocodile, bony and cartilaginous fish, microfossils (e.g., rich diatom assemblages), macro-invertebrates (e.g., bivalve and gastropod mollusks, bryozoan remains, decapod crustaceans, goose-neck barnacles, and echinoderm remains) and marine algae and terrestrial vascular plant assemblages. A few scattered marine mammal bones were reported from the Glenn Ranch area. The La Vida Member of the Puente Formation covers the greatest amount of area within the proposed Portola Center Project boundary, which makes up only a part of the original Glenn Ranch property. Fossils reported from surface exposures in the Glenn Ranch area include poorly preserved fish remains (scales, fin, and bone fragments), and rare internal and external molds of deep-water bivalve and gastropod mollusks. Microfossils such as diatoms and foraminifera are also common in the formation.

The Topanga Formation, exposed mainly outside the project area to the northeast, locally has yielded the greatest amount of fossil material in surface exposures in areas adjacent to the project site. Shallow-water marine fossils typically include bivalve mollusks such as giant oysters, scallops and clams, as well as gastropods, particularly the index fossil snail, *Turritella ocoyana*. Throughout the entire mapped area of Glenn Ranch almost every in-place exposure, as well as surface 'float' blocks contain fossils. Fossil vertebrate remains are also particularly abundant and include bones of whale and marine carnivores. The surficial marine mammal remains represent a significant concentration and strongly suggest that more complete and better preserved materials may be present in the subsurface and would likely be exposed during any grading and earth-moving activities associated with site preparations for the proposed project. Additional fossil localities east of the project site in the vicinity of Upper Oso Reservoir have also yielded important vertebrate as well as invertebrate fossils. At least one new species, of a rock-boring bivalve mollusk, has been described from the Upper Oso Reservoir area.

Museum Collections and Record Searches

Fossil occurrences are also documented in the collections and records of the Orange County paleontological collection in Santa Ana (now the John D. Cooper Archaeological and Paleontological Center), the Vertebrate Paleontology (LACM) and the Invertebrate Paleontology (LACMIP) collections of the Natural History Museum of Los Angeles County in Los Angeles (LACMNH), the University of California Museum of Paleontology in Berkeley (UCMP), and the U.S. Geological Survey (USGS) collections in the Smithsonian Institution in Washington, D.C. LACMNH collections also include the previously orphaned collections of the University of California at Los Angeles (UCLA) and the California Institute of Technology in Pasadena (CIT).

The inventory of fossils in the Cooper Center lists several collections from "Glenn Ranch," but data associated with them seems to have been lost or misplaced.

The LACMIP collection records included 289 Miocene localities from Orange County, of which 16 are from within a one-mile radius of the project site. None are within the project site. Bivalve and gastropod mollusks are the dominant fossils from these formations, which include the Topanga Formation (seven localities), Vaqueros Formation (four localities), Vaqueros-Sespe Formation undifferentiated (one locality), Capistrano Formation undifferentiated (one locality), Puente Formation undifferentiated (one locality), lower Temblor Stage (one locality), and none cited (one locality). A report on LACM fossil records from the museum was prepared on August 16, 2011. The report does not cite any localities from within the bounds of the project site, but does include six localities in the Oso Sand south of the project site that yielded an impressive list of marine vertebrate fossils, including cartilaginous and bony fish, turtles, crocodile, diving birds, and marine and terrestrial mammals. Additional localities from the Topanga Formation have also yielded important vertebrate fossils. The closest locality in the Puente Formation yielded fossil specimens of tonguefish. Several of the LACM vertebrate fossil localities along Aliso Creek and around Upper Oso Reservoir are shown on the LACMIP locality records; refer to the Paleontological Resource Assessment located in Appendix 11.2.

The collection records of UCMP were also queried. Of 262 Miocene localities in Orange County, only nine are listed as from Aliso Creek (or Canyon) or vicinity, and only one of these is from the Puente Formation, which yielded bony fish remains. The other Aliso Creek area invertebrate fossil localities are cited as from the Vaqueros Formation (one locality), the Modelo Formation (four localities), and Temblor Stage sediments (three localities).

PALEONTOLOGICAL RESOURCES SURVEY

A pedestrian field survey revealed the presence of both in situ fossil remains of bony fish (large scales, vertebrae and indeterminate bone fragments) and plant materials (leaves and indeterminate plant debris) in outcrop exposures of both the La Vida Member and the siltstone submember of the Soquel Member of the Puente Formation both north and south of Glenn Ranch Road. No in situ fossils were recognized in sandstone outcrops of the Soquel Member. Float materials, some with abundant specimens of small bivalve mollusks were present in finer-grained concretionary clasts at multiple locations on the engineered fill surfaces north of Glenn Ranch Road. One of these specimens was associated with marine mammal bone in the same clast. These may have been derived from Topanga Formation outcrops farther up the slope from the current property during grading activities associated with development of the Portola Hills Community. South of Glenn Ranch Road, large concretionary sandstone boulders used as rip-rap to channel drainage runoff contained numerous specimens of large bivalve mollusks, such as giant oysters and scallops, as well as marine mammal bones. The coarseness of the sand grains in the enclosing sediments appeared identical to in situ outcrops of Soquel sandstone and could well have been derived from the project site during the latest phase of earth-moving activities. The abundance of fossils in situ and as float is strongly suggestive that any new excavation and/or grading activities would expose many more fossil specimens.

5.2.2 REGULATORY SETTING

Numerous laws and regulations require Federal, State, and local agencies to consider the effects a project may have on cultural resources. These laws and regulations stipulate a process for compliance, define the responsibilities of the various agencies proposing the action, and prescribe the relationship among other involved agencies (i.e., State Historic Preservation Office and the Advisory Council on Historic Preservation). The National Historic Preservation Act (NHPA) of 1966, as amended, the California Environmental Quality Act (CEQA), and the California Register of Historical Resources, Public Resources Code (PRC) 5024, are the primary Federal and State laws governing and affecting preservation of cultural resources of national, State, regional, and local significance. The applicable regulations are discussed below.

FEDERAL

National Historic Preservation Act of 1966

Enacted in 1966 and amended in 2000, the National Historic Preservation Act (NHPA) declared a national policy of historic preservation and instituted a multifaceted program, administered by the Secretary of the Interior, to encourage the achievement of preservation goals at the Federal, State and local levels. The NHPA authorized the expansion and maintenance of the National Register of Historic Places (NRHP or National Register), established the position of State Historic Preservation Officer (SHPO) and provided for the designation of State Review Boards, set up a mechanism to certify local governments to carry out the purposes of the NHPA, assisted Native American tribes to preserve their cultural heritage and created the Advisory Council on Historic Preservation (ACHP).

Section 106 Process

Through regulations associated with the NHPA, an impact to a cultural resource would be considered significant if government action will affect a resource listed in or eligible for listing in the National Register. The NHPA codifies a list of cultural resources found to be significant within the context of national history, as determined by a technical process of evaluation. Resources that have not yet been placed on the National Register, and are yet to be evaluated, are afforded protection under the Act until shown to be not significant.

Section 106 of the NHPA and its implementing regulations (36 Code of Federal Regulations Part 800) note that for a cultural resource to be determined eligible for listing in the National Register, the resource must meet specific criteria associated with historic significance and possess certain levels of integrity of form, location, and setting. The criteria for listing on the National Register are applied within an analysis when there is some question as to the significance of a cultural resource. The criteria for evaluation are defined as the quality of significance in American history, architecture, archeology, engineering, and culture. This quality must be present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association. A property is eligible for the NRHP if it is significant under one or more of the following criteria:

- *Criterion A*: It is associated with events that have made a significant contribution to the broad patterns of our history; or

- *Criterion B*: It is associated with the lives of persons significant in our past; or

- *Criterion C*: It embodies the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

- *Criterion D*: It has yielded, or may be likely to yield, information important in prehistory or history.

Criterion (D) is usually reserved for archaeological resources. Eligible cultural resources must meet at least one of the above criteria and exhibit integrity, measured by the degree to which the resource retains its historical properties and conveys its historical character.

The Section 106 evaluation process does not apply to projects undertaken under City environmental compliance jurisdiction; however, should the undertaking require funding, permits or other administrative actions issued or overseen by a federal agency, analysis of potential impacts to cultural resources following the Section 106 process will likely be necessary. The Section 106 process typically excludes cultural resources created less than 50 years ago unless the resource is considered highly significant from the local perspective. Finally, the Section 106 process allows local concerns to be voiced and the Section 106 process must consider aspects of local significance before a significance judgment is rendered.

STATE LEVEL

California Environmental Quality Act

As defined in Section 21083.2 of CEQA, a "unique" archaeological resource is an archaeological artifact, object, or site, about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information.

- Has a special and particular quality, such as being the oldest of its type or the best available example of its type.

- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

If a lead agency determines that an archaeological site is a historical resource, the provisions of Section 21084.1 of CEQA and Section 15064.5 of the CEQA Guidelines apply. If an archaeological site does not meet the criteria for a historical resource contained in the CEQA Guidelines, then the site is to be treated in accordance with the provisions of CEQA Section 21083, which is unique archaeological resource. The CEQA Guidelines note that if an archaeological resource is neither a unique archaeological nor a historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment (CEQA Guidelines Section 15-64.5(c)(4)).

California Register of Historical Resources

Created in 1992 and implemented in 1998, the California Register of Historical Resources (CRHR) is "an authoritative guide in California to be used by State and local agencies, private groups, and citizens to identify the State's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change." Certain properties, including those listed in or formally determined eligible for listing in the NRHP and California Historical Landmarks numbered 770 and higher, are automatically included in the CRHR. Other properties recognized under the California Points of Historical Interest program, identified as significant in historical resources surveys or designated by local landmarks programs, may be nominated for inclusion in the CRHR. A resource, either an individual property or a contributor to a historic district, may be listed in the CRHR if the State Historical Resources Commission determines that it meets one or more of the following criteria, which are modeled on NRHP criteria:

- *Criterion 1*: It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
- *Criterion 2*: It is associated with the lives of persons important in our past.
- *Criterion 3*: It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
- *Criterion 4*: It has yielded, or may be likely to yield, information important in history or prehistory.

LOCAL LEVEL

City of Lake Forest General Plan

City policies pertaining to cultural resources are contained in the Recreation and Resources Element of the Lake Forest General Plan. The Recreation and Resources Element describes methods for protecting historic, archaeological, and paleontological resources, and provides local policies to guide the implementation of cultural resource preservation, beyond the protections afforded by applicable federal, state, and local laws. These policies include the following:

- Protect areas of important historic, archaeological, and paleontological resources. (Policy 4.1)
- Identify, designate, and protect buildings or sites of historical significance. (Policy 4.2)

5.2.3 IMPACT THRESHOLDS AND SIGNIFICANCE CRITERIA

The purpose of this analysis is to identify any potential cultural resources within or adjacent to the project site, and to assist the Lead Agency in determining whether such resources meet the official definitions of "historical resources," as provided in the Public Resource Code, in particular CEQA.

SIGNIFICANCE GUIDELINES

Historical Resources

Impacts to a significant cultural resource that affect characteristics that would qualify it for the NRHP or that adversely alter the significance of a resource listed in or eligible for listing in the CRHR are considered a significant effect on the environment. These impacts could result from "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" (CEQA Guidelines, Section 15064.5 [b][1], 2000). Material impairment is defined as demolition or alteration "in an adverse manner [of] those characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in, the California Register" (CEQA Guidelines Section 15064.5[b][2][A]).

Archaeological Resources

A significant prehistoric archaeological impact will occur if grading and construction activities will result in a substantial adverse change to archaeological resources determined to be "unique" or "historic." "Unique" resources are defined in Public Resources Code Section 21083.2; "historic" resources are defined in Public Resources Code Section 21084.1 and CEQA Guidelines Section 15126.4.

Public Resources Code Section 21083.2(g) states:

> *As used in this section, "unique archaeological resource" means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:*
>
> 1. *Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information;*
> 2. *Has a special and particular quality, such as being the oldest of its type or the best available example of its type; or*
> 3. *Is directly associated with a scientifically recognized important prehistoric or historic event or person.*

Paleontological Resources

An impact on paleontological materials would be considered a significant impact if the project results in the direct or indirect destruction of a unique or important paleontological resource or site. The following criteria are used to determine whether a resource is unique or important:

- The past record of fossil recovery from the geologic unit(s);
- The recorded fossil localities in the project site;
- Observation of fossil material on-site; and
- The type of fossil materials previously recovered from the geologic unit (vertebrate, invertebrate, etc.).

CEQA SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines contains the Initial Study Environmental Checklist form, which includes questions relating to cultural resources. The issues presented in the Initial Study Checklist have been utilized as thresholds of significance in this section. Accordingly, a project may create a significant adverse environmental impact if it would:

- Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5 (refer to Section 8.0, *Effects Found Not to be Significant*);

- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 (refer to Impact Statement CUL-1);

- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature (refer to Impact Statement CUL-2); and/or

- Disturb any human remains, including those interred outside of formal cemeteries (refer to Section 8.0, *Effects Found Not to be Significant*).

Based on these standards/criteria, the effects of the proposed project have been categorized as either a "less than significant impact" or a "potentially significant impact." If a potentially significant impact cannot be reduced to a less than significant level through the application of goals, policies, standards or mitigation, it is categorized as a significant and unavoidable impact. The standards used to evaluate the significance of impacts are often qualitative rather than quantitative because appropriate quantitative standards are either not available for many types of impacts or are not applicable for some types of projects.

5.2.4 OVERVIEW OF OSA PEIR CULTURAL RESOURCES ANALYSIS

The OSA PEIR analyzed potential impacts to cultural resources (historical, archaeological, and paleontological resources) associated with the proposed Lake Forest Opportunities Study. The OSA PEIR concluded that potential impacts to cultural resources would be reduced to a less than

significant level with implementation of mitigation and compliance with statutory requirements, as described below.

As concluded in the OSA PEIR, no historical resources were identified in the OSA. No structures were identified as eligible or potentially eligible for listing on the National Register of Historic Places (National Register) or the California Register of Historical Resources (CRHR). The OSA PEIR concluded that the OSA project would not result in any adverse change in the significance of designated structures or structures eligible for designation.

The OSA PEIR identified 12 archaeological sites within the OSA and additional sites have been documented within a 0.5-mile radius of the OSA. The OSA PEIR concluded that the potential exists for encountering intact components of these sensitive sites during ground-disturbing activities, which would be considered a potentially significant impact. The OSA PEIR also concluded that with implementation of OSA PEIR Mitigation Measures 3.5-1 through 3.5-4, which require assessment, avoidance, or data recovery, and monitoring of construction activities, potentially significant impacts on archaeological resources would be reduced to a less than significant level.

According to OSA PEIR, the geologic formations underlying the OSA are known to contain paleontological resources. The potential exists for ground disturbing construction activities to affect these resources. The OSA PEIR concluded that with implementation of OSA PEIR Mitigation Measures 3.5-5 through 3.5-8, which require, monitoring, and recovery, potentially significant impacts on paleontological resources would be reduced to a less than significant level.

According to the OSA PEIR, no formal cemeteries are known to have occupied the OSA. However, because archaeological resources have been identified in the OSA, additional materials, including human burials, may potentially occur, resulting in a potentially significant impact. The OSA PEIR concluded compliance with the applicable provisions of PRC Section 5097.98 would ensure this impact remains less than significant.

5.2.5 IMPACTS AND MITIGATION MEASURES

ARCHAEOLOGICAL RESOURCES

CUL-1 THE PROPOSED PROJECT WOULD NOT CAUSE A SIGNIFICANT IMPACT TO KNOWN OR UNKNOWN ARCHAEOLOGICAL RESOURCES THAT COULD OCCUR ON-SITE.

Impact Analysis: According to OSA PEIR (page 3.5-12), 12 archaeological sites have been identified in the OSA and additional sites have been documented within a 0.5-mile radius of the OSA. The OSA PEIR concluded that the potential exists for encountering intact components of these sensitive sites during ground-disturbing activities, which would be considered a potentially significant impact. The OSA PEIR also concluded that with implementation of OSA PEIR Mitigation Measures 3.5-1 through 3.5-4, which require assessment, avoidance, or data recovery, and monitoring of construction activities, potentially significant impacts on archaeological resources would be reduced to a less than significant level. More specifically, OSA PEIR Mitigation Measure 3.5-1 states that if, before grading, any portions of the property subject to the grading permit have been identified as sites, which may have such resources present and may be impacted by

development, the archaeologist shall conduct a site survey and records search and such further examination as may be needed to assess the significance of the resources.

In compliance with OSA PEIR Mitigation Measure 3.5-1, a Cultural Resources Study of the Portola Center project has been conducted. The cultural resources study consisted of records searches, an intense pedestrian survey, and an archaeological testing and significance evaluation program for five prehistoric cultural resources located within the project area, as described in the *Existing Setting* discussion above.

Based upon the results of the testing program, Sites ORA-441, ORA-442, ORA-443, and ORA-446 have all been characterized as prehistoric resource extraction sites and temporary camps. Site ORA-445 has been characterized as highly disturbed. Within the project area, all five sites are disturbed and have no remaining intact features or subsurface deposits. The subsurface excavations combined with the collection and curation of surface artifacts and recordation of the sites has exhausted the research potential for all five sites (CA-ORA-441; CA-ORA-442; CA-ORA-443; CA-ORA-445; and CA-ORA-446), and mitigated potential significant impacts to the sites associated with the proposed project to a less than significant level.

As concluded in the OSA PEIR and verified by the Cultural Resources Study, the potential exists for previously undetected subsurface archaeological resources to be encountered during ground-disturbing activities. Dense vegetation or erosional soils may be masking or covering archaeological sites that would be exposed during grading. Project development could cause a substantial adverse change in the significance of an archaeological resource through inadvertent damage or destruction. The project would be subject to compliance with OSA PEIR Mitigation Measure 3.5-1, as modified, which requires monitoring during all ground-disturbing activities within the project boundaries and specifies the necessary measures, in the event historical resources or unique archaeological resources are discovered. Although OSA PEIR Mitigation Measure 3.5-1 has been modified, the overall intent of the mitigation measure remains unchanged. Modifications to OSA PEIR Mitigation Measure 3.5-1 include removal of the need for a site survey, records search, and further examination to assess the significance of resources, as a Cultural Resources Study of the project site has been conducted, in compliance with OSA PEIR Mitigation Measure 3.5-1. The Cultural Resources Study conducted a records search, pedestrian survey, and an archaeological testing and significance evaluation program for five prehistoric cultural resources located within the project area. Additionally, more detailed requirements of the grading monitoring program and required actions in the event resources are discovered have been added to OSA PEIR Mitigation Measure 3.5-1 in order to provide specific measures for the protection of potentially undiscovered archaeological resources. Incorporation of OSA PEIR Mitigation Measure 3.5-1, as modified, and OSA PEIR Mitigation Measure 3.5-2 through Mitigation Measure 3.5-4 would ensure project implementation would not cause a substantial adverse change in the significance of an archaeological resource. Impacts would be less than significant in this regard.

Standard Conditions of Approval: No Standard Conditions of Approval are applicable to this topical area.

Applicable OSA Mitigation Measures:

3.5-1 Prior to issuance of a grading permit for any site within the Project Area, a qualified archaeologist shall be retained by the Applicant for that grading permit to provide professional archaeological services. The archaeologist shall be present at the pre-grading conference to establish procedures for archaeological resource surveillance. Those procedures shall include provisions for temporarily halting or redirecting work to permit sampling, identification, and evaluation of resources deemed by the archaeologist to potentially be historical resources or unique archaeological resources under CEQA. ~~If, before grading, any portions of the property subject to the grading permit have been identified as sites, which may have such resources present and may be impacted by development, the archaeologist shall conduct a site survey and records search and such further examination as may be needed to assess the significance of the resources. If the archaeological resource is determined to be a unique archaeological resource, options for avoidance or preservation in place shall be evaluated and implemented if feasible. In the event that avoidance or preservation in place is infeasible and the archaeologist determines that the potential for significant impacts to such resources exists, a data recovery program shall be expeditiously conducted.~~ The archaeologist also shall conduct on-site archaeological monitoring for the grading operation. Should historical resources or unique archaeological resources be discovered during the grading operation, grading activities shall be modified to allow expeditious and proper analysis and/or salvage of the resources. Disposition of the resources shall be within the discretion of the City of Lake Forest.

A. Prior to Approval of Grading or Improvement plans, the Applicant shall implement a grading monitoring plan to mitigate potential impacts to undiscovered buried archaeological resources on the Portola Center Project to the satisfaction of the City of Lake Forest. This program shall include, but shall not be limited to, the following actions:

1. Provide evidence to the lead agency that a qualified archaeologist has been contracted to implement a grading monitoring program to the satisfaction of the City of Lake Forest. A letter from the Project Archaeologist shall be submitted to the City of Lake Forest Director of Development Services. The letter shall include the following guidelines:

   a. The consulting archaeologist shall contract with a Native American monitor to be involved with the grading monitoring program.

   b. The qualified archaeologist/historian and Native American Monitor shall attend the pre-grading meeting with the contractors to explain and coordinate the requirements of the monitoring program.

   c. The consulting archaeologist shall monitor all areas identified for development.

   d. An adequate number of monitors (archaeological/ historical/Native American) shall be present to ensure that all earth-moving activities are observed and shall be on site during all grading activities.

e. During the original cutting of previously undisturbed deposits, the archaeological monitor(s) and Native American monitor(s) shall be on site full-time. Inspections will vary based on the rate of excavation, the materials excavated, and the presence and abundance of artifacts and features. The frequency and location of inspections shall be determined by the Principal Investigator.

f. During the cutting of previously disturbed deposits, the archaeological monitor(s) and Native American monitor(s) shall be on site as determined by the Principal Investigator of the excavations. Inspections will vary based on the rate of excavation, the materials excavated, and the presence and abundance of artifacts and features. The frequency and location of inspections shall be determined by the Principal Investigator in consultation with the Native American monitor.

g. Isolates and clearly non-significant deposits shall be minimally documented in the field and the monitored grading can proceed.

h. In the event that previously unidentified, potentially significant cultural resources are discovered, the archaeologist shall have the authority to divert or temporarily halt ground disturbance operations in the area of discovery to allow for evaluation. The archaeologist shall contact the City of Lake Forest Director of Development Services at the time of discovery. Disposition of the resources shall be within the discretion of the City of Lake Forest. For significant cultural resources, a Research Design and Data Recovery Program to mitigate impacts shall be prepared by the consulting archaeologist, then carried out using professional archaeological methods.

i. If any human bones are discovered, the Principal Investigator shall contact the County Coroner. In the event that the remains are determined to be of Native American origin, the Most Likely Descendant, as identified by the Native American Heritage Commission, shall be contacted in order to determine proper treatment and disposition of the remains.

j. Before construction activities are allowed to resume in the affected area, the artifacts shall be recovered and features recorded using professional archaeological methods. The Principal Investigator shall determine the amount of material to be recovered for an adequate artifact sample for analysis.

k. In the event that previously unidentified cultural resources are discovered, all cultural material collected during the grading monitoring program shall be processed and curated at a facility that meets federal standards per 36 CFR Part 79, and therefore shall be professionally curated and made available to other archaeologists/researchers for further study. The collections and associated records shall be transferred, including title, to the John D. Cooper Archaeological and Paleontological Curation Center, to be accompanied by

payment of the fees necessary for permanent curation. Evidence shall be in the form of a letter from the curation facility identifying that archaeological materials have been received and that all fees have been paid.

l. In the event that previously unidentified cultural resources are discovered, a report documenting the field and analysis results and interpreting the artifact and research data within the research context shall be completed and submitted to the satisfaction of the City of Lake Forest prior to the issuance of any building permits. The report shall include Department of Parks and Recreation Primary and Archaeological Site Forms.

m. In the event that no cultural resources are discovered, a brief letter to that effect shall be sent to the City of Lake Forest by the consulting archaeologist that the grading monitoring activities have been completed.

2. Provide evidence to the Lead Agency that the following notes have been placed on the Grading Plan:

   a. The qualified archaeologist/historian and Native American monitor shall attend the pre-construction meeting with the contractors to explain and coordinate the requirements of the monitoring program.

   b. During the original cutting of previously undisturbed deposits, the archaeological monitor(s) and Native American monitor(s) shall be on site to perform full-time monitoring as determined by the Principal Investigator of the excavations. The frequency of inspections shall depend on the rate of excavation, the materials excavated, and the presence and abundance of artifacts and features.

   c. During the cutting of previously disturbed deposits, the archaeological monitor(s) and Native American monitor(s) shall be on site as determined by the Principal Investigator of the excavations. Inspections will vary based on the rate of excavation, the materials excavated, and the presence and abundance of artifacts and features. The frequency and location of inspections shall be determined by the Principal Investigator in consultation with the Native American monitor.

   d. In the event that previously unidentified, potentially significant cultural resources are discovered, the archaeologist shall have the authority to divert or temporarily halt ground disturbance operations in the area of discovery to allow for evaluation. The archaeologist shall contact the City of Lake Forest Director of Development Services at the time of discovery. Disposition of the resources shall be within the discretion of the City of Lake Forest. For significant cultural resources, a Research Design and Data Recovery Program to mitigate impacts shall be prepared by the consulting archaeologist, then carried out using professional archaeological methods.

e. The consulting archaeologist shall monitor all areas identified for development.

f. If any human bones are discovered, the Principal Investigator shall contact the County Coroner. In the event that the remains are determined to be of Native American origin, the Most Likely Descendant, as identified by the Native American Heritage Commission, shall be contacted in order to determine proper treatment and disposition of the remains.

g. Prior to rough grading inspection sign-off, provide evidence that the field grading monitoring activities have been completed to the satisfaction of the City of Lake Forest. Evidence shall be in the form of a letter from the Project Archaeologist.

h. Prior to final grading release, submit to the satisfaction of the City of Lake Forest, a final report that documents the results, analysis, and conclusions of all phases of the Archaeological Monitoring Program. The report shall also include the following:

- Department of Parks and Recreation Primary and Archaeological Site Forms.

- Evidence that all cultural materials collected during the grading monitoring program has been curated, and therefore shall be professionally curated and made available to other archaeologists/ researchers for further study. The collections and associated records shall be transferred, including title, the John D. Cooper Archaeological and Paleontological Curation Center, to be accompanied by payment of the fees necessary for permanent curation. Evidence shall be in the form of a letter from the curation facility identifying that archaeological materials have been received and that all fees have been paid.

3. In the event that no cultural resources area discovered, a brief letter to that effect shall be sent to the City of Lake Forest by the consulting archaeologist that the grading monitoring activities have been completed.

3.5-2 The qualified archaeologist retained shall prepare monthly progress reports to be filed with the site developer(s) and the City of Lake Forest.

3.5-3 Artifacts recovered shall be prepared, identified, and cataloged before donation to the accredited repository designated by the City of Lake Forest. Any artifacts determined to be insignificant shall be offered to local schools for use in educational programs.

3.5-4 The qualified archaeologist retained shall prepare a final report to be filed with the site developer(s) and the City of Lake Forest. The report shall include a list of specimens recovered, documentation of each locality, interpretation of artifacts recovered and shall include all specialists' reports as appendices.

Additional Mitigation Measures: No additional mitigation measures are required.

Level of Significance: Less Than Significant Impact With Mitigation Incorporated.

PALEONTOLOGICAL RESOURCES

CUL-2 THE PROPOSED PROJECT WOULD NOT CAUSE A SIGNIFICANT IMPACT TO KNOWN OR UNKNOWN PALEONTOLOGICAL RESOURCES THAT COULD OCCUR ON-SITE.

Impact Analysis: According to OSA PEIR (page 3.5-12), the geologic formations underlying the OSA are known to contain paleontological resources. The potential exists for ground disturbing construction activities to affect these resources. The OSA PEIR concluded that with implementation of OSA PEIR Mitigation Measures 3.5-5 through 3.5-8, which require monitoring and recovery, potentially significant impacts on paleontological resources would be reduced to a less than significant level.

The Paleontological Resource Assessment conducted for the project site identifies the paleontological sensitivity of the geologic units within and closely adjacent to the project area as "very high" and "high." Additionally, all of the Tertiary sedimentary formations within the project boundaries have yielded marine fossils, either on the subject property or in nearby exposures. In addition to the previously recorded fossil localities from the vicinity of the Portola Center project site, a pedestrian field survey revealed the presence of both in situ fossil remains of bony fish (large scales, vertebrae and indeterminate bone fragments) and plant materials (leaves and indeterminate plant debris) in outcrop exposures of both the La Vida Member and the siltstone submember of the Soquel Member of the Puente Formation both north and south of Glenn Ranch Road. Therefore, unless mitigated, project development could cause a substantial adverse change in the significance of known paleontological resources. The project would be subject to compliance with OSA PEIR Mitigation Measure 3.5-5, as modified, which requires a County-certified paleontologist conduct a pre-grade salvage program to collect and recover all significant paleontological resources previously recognized and recorded. Modification of OSA PEIR Mitigation Measure 3.5-5 requiring a pre-grade salvage program would reduce potential impacts to known paleontological resources that have been identified as part of the project's Paleontological Resource Assessment. Therefore, with implementation of OSA PEIR Mitigation Measure 3.5-5, as modified, project implementation would not cause a substantial adverse change in the significance of a known paleontological resource. Impacts would be less than significant in this regard.

The Paleontological Resource Assessment also concluded that any new excavation and/or grading activities would expose many more fossil specimens, possibly of considerable significance, given the abundance of fossils in situ and as float. Therefore, project development could cause a substantial adverse change in the significance of an as-yet undiscovered paleontological resource through inadvertent damage or destruction. The project would be subject to compliance with OSA PEIR Mitigation Measure 3.5-5 and 3.5-8, as modified, which require a qualified paleontologist to conduct on-site paleontological monitoring for the project site during grading activities and specifies the necessary actions in the event specimens are recovered. Although OSA PEIR Mitigation Measure 3.5-5 and 3.5-8 have been modified, the overall intent of the mitigation measures in regards to unknown paleontological resources remains unchanged. Modifications to OSA PEIR Mitigation

Measure 3.5-5 provide more specific detail regarding the requirements and responsibilities of the paleontologist monitoring grading activities at the project site. Modifications to OSA PEIR Mitigation Measure 3.5-8 identify the requirements for recovering, preparing, and curating specimens, as well as preparation of a final monitoring and mitigation report of findings and significance. Incorporation of OSA PEIR Mitigation Measures 3.5-5 and 3.5-8, as modified, and OSA PEIR Mitigation Measures 3.5-6 and 3.5-7 would ensure project implementation would not cause a substantial adverse change in the significance of an unknown paleontological resource. Impacts would be less than significant in this regard.

Standard Conditions of Approval: No Standard Conditions of Approval are applicable to this topical area.

Applicable OSA Mitigation Measures:

3.5-5 Prior to issuance of a grading permit, a qualified paleontologist shall be retained by the site developer(s) to provide professional paleontological services. ~~Specifically, during grading activities, the qualified paleontologist shall conduct on-site paleontological monitoring for the project site. Monitoring shall include inspection of exposed surfaces and microscopic examination of matrix to determine if fossils are present. The monitor shall have authority to divert grading away from exposed fossils temporarily in order to recover the fossil specimens. Cooperation and assistance from on-site personnel will greatly assist timely resumption of work in the area of the fossil discovery.~~

1. The paleontologist shall conduct a pre-grade salvage program to collect and recover all significant paleontological resources previously recognized and recorded during the pre-grade survey of the property. All exposed specimens, even those occurring only as float, shall be collected at this stage of the mitigation. If the paleontologist of record is responsible for supervising the paleontological monitoring program during mass grading and earth-moving activities, all fossils salvaged at that time can be retained and processed with those recovered during the paleontological monitoring program.

2. Prior to initiation of grading, the project Applicant shall provide written evidence to the City of Lake Forest that the Applicant has retained a County-certified paleontologist to observe grading activities, supervise the monitoring program and be responsible for all aspects of the Paleontological Mitigation Monitoring and Reporting Program (MMRP). The paleontologist shall be present at the pre-grade conference, shall establish procedures for paleontological resource surveillance, and shall establish, in cooperation with the Applicant, procedures for temporarily halting or redirecting work to permit sampling, identification, and evaluation of the fossils. If the paleontological resources are found to be significant, the paleontologist shall determine appropriate actions, in cooperation with the Applicant, which ensure proper exploration and/or salvage.

3. ~~Specifically,~~ During grading activities, the qualified paleontologist shall conduct on-site paleontological monitoring for the project site. Monitoring shall include inspection of exposed surfaces and microscopic examination of matrix to determine

if fossils are present. The monitor shall have authority to divert grading away from exposed fossils temporarily in order to recover the fossil specimens. Cooperation and assistance from on-site personnel will greatly assist timely resumption of work in the area of the fossil discovery.

A. Paleontological monitoring of mass grading and excavation activities in areas identified as likely to contain paleontological resources shall be required by a qualified paleontologist and/or paleontological monitor(s). Monitoring shall be conducted in areas of grading or excavation in undisturbed formational deposits, as well as in areas where over-excavation of surficial sediments or deposits will encounter these formations in the subsurface. Paleontological monitors shall be equipped to salvage fossils as they are unearthed to avoid construction delays and to remove samples of sediment that are likely to contain the remains of small fossil invertebrates and vertebrates. The monitor shall be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens in a timely manner. Monitors shall be expected to carefully record the location, elevation, and stratigraphic position, and fully document all aspects of the recovery of all significant collections. It is recommended that monitors be equipped with GPS devices to accurately record the position of any fossil localities in a continuously changing landscape.

   Monitoring may be reduced in areas if the potentially fossiliferous units are not present in the subsurface, or if present, are determined upon exposure and examination by qualified paleontological personnel to have low potential to contain fossil resources.

3.5-6 The qualified paleontologist retained shall prepare monthly progress reports to be filed with the site developer(s) and the City of Lake Forest.

3.5-7 Fossils recovered shall be prepared, identified, and cataloged before donation to the accredited repository designated by the City of Lake Forest.

3.5-8 The qualified paleontologist retained shall prepare a final report to be filed with the site developer(s) and the City of Lake Forest. The report shall include a list of specimens recovered, documentation of each locality, interpretation of fossils recovered and shall include all specialists' reports as appendices.

1. Recovered specimens shall be prepared to a point of identification and permanent preservation. Screen-washing of sediments to recover small invertebrates and vertebrates may also be necessary. Preparation procedures include cleaning, physical removal of matrix surrounding individual fossils, and repair of damaged specimens. Large specimens of fossil vertebrates encased in cemented matrix, as has been observed on the property and on adjacent properties, may be extremely time consuming to prepare properly, and in such cases, consultation between the City of Lake Forest, the developer, the institutional repository, and the project paleontologist may be necessary.

2. Following preparation of recovered specimens to a point of identification, fossils shall be properly curated to museum standards, before being offered to any institutional collection for permanent long-term archival care and conservation. Curation steps shall include identification of fossils to the lowest level possible, painting and numbering of specimens, and production of labels. Prearrangements shall be made with an institution such that the receiving institution's specimen and/or locality numbers can be applied to each specimen. Numbers shall be applied with waterproof India ink on permanent enamel or acrylic paint. Small specimens shall be placed in glass vials with inert plastic caps, and the appropriate locality and/or specimen numbers enclosed with the fossils. All labels shall be printed on acid-free paper or card or cover stock.

3. Specimens shall be curated into a professional, accredited public museum repository with a commitment to archival conservation and permanent retrievable storage (e.g., the Ralph B. Clark Regional Park Interpretive Center) is a requirement. The paleontological program shall include a written repository agreement prior to the initiation of post-grade mitigation activities. Copies of all field notes, field maps, photographs, and documentary materials shall accompany the fossils when offered to the archiving institution. The developer shall agree to be responsible for any one-time archival fees charged by the receiving institution. These fees shall cover the cost of steel storage cabinets or shelving, cabinet drawers, specimen trays, and the time and materials necessary to catalogue and fully integrate the new materials into the preexisting collections.

4. A final monitoring and mitigation report of findings and significance, including lists of all fossils recovered and necessary maps and graphics to accurately record their original location, shall be prepared. The report shall include documentation of acceptance or deed of gift from the receiving institution. The final report, when submitted to the City of Lake Forest, shall signify satisfactory completion of the project program to mitigate impacts to any potential nonrenewable paleontological resources (i.e., fossils) that might have been lost or otherwise adversely affected without such a program in place. Final release of any grading bond shall be approved by the City of Lake Forest only when the final monitoring and mitigation report and the fossil collections have been accepted by the receiving institution and any fees paid.

Additional Mitigation Measures: No additional mitigation measures are required.

Level of Significance: Less Than Significant Impact With Mitigation Incorporated.

5.2.6 CUMULATIVE IMPACTS

- **THE PROPOSED PROJECT, COMBINED WITH OTHER RELATED CUMULATIVE PROJECTS, WOULD NOT CAUSE A SIGNIFICANT IMPACT TO KNOWN OR UNKNOWN ARCHAEOLOGICAL RESOURCES THAT COULD OCCUR ON-SITE.**

- **THE PROPOSED PROJECT, COMBINED WITH OTHER RELATED CUMULATIVE PROJECTS, WOULD NOT CAUSE A SIGNIFICANT IMPACT TO KNOWN OR UNKNOWN PALEONTOLOGICAL RESOURCES THAT MAY OCCUR ON-SITE.**

Impact Analysis: Table 4-1, *Cumulative Projects List*, identifies the related projects and other possible development in the area determined as having the potential to interact with the proposed project to the extent that a significant cumulative effect may occur. Due to the location of the cumulative projects and the high sensitivity for cultural resources to occur within the City, there is the potential that known and/or unknown archeological resources and paleontological resources could occur at one or more of the cumulative project sites. The potential destruction of archaeological resources associated with ground disturbance activities at the project site and cumulative project sites could be cumulatively considerable, due to the collective loss of historical artifacts and knowledge regarding the culture of the people who lived at the respective sites. Additionally, the destruction of paleontological resources could be cumulatively considerable, as fossils provide biological information of ancient life, which would no longer be available for study. However, individual projects would be evaluated on a project-by-project basis to determine the extent of potential impacts to archeological and paleontological resources. With adherence to State and Federal statutes, as well as project-specific mitigation measures, cumulative impacts to archaeological and paleontological resources would be reduced to less than significant levels. With implementation of OSA PEIR Mitigation Measures 3.5-1 through 3.5-8, the project would not cumulatively contribute to substantial archaeological and paleontological resource impacts. A less than significant impact would occur in this regard.

Standard Conditions of Approval: No Standard Conditions of Approval are applicable to this topical area.

Applicable OSA Mitigation Measures: Refer to OSA PEIR Mitigation Measures 3.5-1 through 3.5-8.

Additional Mitigation Measures: No additional mitigation measures are required.

Level of Significance: Less Than Significant With Mitigation Incorporated.

5.2.7 SIGNIFICANT UNAVOIDABLE IMPACTS

No unavoidable significant impacts related to cultural resources have been identified following implementation of mitigation measures referenced in this section.

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