ARCHAEOLOGICAL RESOURCES TECHNICAL REPORT

SUNSET RIDGE PARK PROJECT NEWPORT BEACH, CALIFORNIA

Prepared for

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October 2009

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1.0 INTRODUCTION

This report documents the archaeological resources effort undertaken to date for the proposed Sunset Ridge Park project. This effort includes a review of existing and available cultural resources literature; Native American scoping with the Native American Heritage Commission and local Native American tribes and individuals; a field check of the project site; and this section, which details the results of the study and offers management recommendations and proposed mitigation measures.

2.0 RELEVANT REGULATIONS

2.1 STATE

The California Environmental Quality Act (CEQA) requires a lead agency to determine whether a project may have a significant effect on one or more historical resources. A "historical resource" is defined as a resource listed in or determined to be eligible for listing in the California Register of Historical Resources (CRHR) (*Public Resources Code* [PRC] §21084.1); a resource included in a local register of historical resources (*California Code of Regulations* [CCR] §15064.5[a][2]); or any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant (CCR §15064.5[a][3]).

Section 5024.1 of the PRC, Section 15064.5 of the CEQA Guidelines, and Sections 21083.2 and 21084.1 of the CEQA Statutes were used as the basic guidelines for the cultural resources study. The PRC 5024.1 requires evaluation of historical resources to determine their eligibility for listing on the CRHR. The purposes of the register are to maintain listings of the State's historical resources and to indicate which properties are to be protected from substantial adverse change. The criteria for listing resources in the CRHR were expressly developed to be in accordance with previously established criteria for listing in the National Register of Historic Places (NRHP).

According to Section 15064.5(a)(3)(A–D) of the CEQA Guidelines, a resource is considered historically significant if it:

(A) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

(B) Is associated with the lives of persons important in our past;

(C) Embodies the distinctive characteristics of a type, period, region or method of installation, or represents the work of an important creative individual, or possesses high artistic values; or

(D) Has yielded, or may be likely to yield, information important in prehistory or history.

Impacts to significant cultural resources that affect those characteristics of the resource that qualify it for the NRHP or adversely alter the significance of a resource listed in or eligible for listing in the CRHR are considered a significant effect on the environment. Impacts to cultural resources from the proposed project are thus considered significant if the project (1) physically destroys or damages all or part of a resource; (2) changes the character of the use of the resource or physical feature within the setting of the resource that contributes to its significance; and/or (3) introduces visual, atmospheric, or audible elements that diminish the integrity of significant features of the resource.

The purpose of the current study is to evaluate whether any cultural resources remain exposed on the surface of the project area. If resources are discovered, management recommendations would include evaluating the resources for CRHR/NRHP eligibility.

2.2 CITY OF NEWPORT BEACH

The City of Newport Beach has adopted archaeological guidelines (Policy # K-5, adopted on January 13, 1975, amended on January 24, 1994, and corrected on March 22, 1999) which govern the identification and evaluation of these resources and are used to guide the development or redevelopment of lands within the City. The discussion below is adapted from the City Council Policy Manual guidelines.

1. The City shall, through its planning policies and permit conditions, ensure the preservation of significant archaeological resources and require that the impact caused by any development be mitigated in accordance with CEQA.

2. The City shall prepare and maintain sources of information regarding archaeological sites and the names and addresses of responsible organizations and qualified individuals who can analyze, classify, record, and preserve archaeological findings.

3. The Planning Director shall determine if it is necessary for a landowner or developer to examine the proposed site to determine the existence and extent of archaeological resources prior to the commencement of land development. The examination shall be by qualified observers approved by the City. The observers shall prepare and submit to the City a written report describing findings and making recommendations for further action. The report shall discuss both positive and negative aspects of the proposed development's effects on archaeological resources. The report shall be considered part of the CEQA review process and, if appropriate, the recommendations shall be included as mitigation measures and conditions of approval for the project.

4. Based on the report and recommendations of the observers, the City shall take such steps as are necessary to assure that any findings or sites are recorded, preserved, and protected. These steps may include requirements that the landowner or developers incur reasonable expenditures of time or money, encouragement for the appropriate volunteer or non-profit organizations to become involved, or acquisition of the sites by public or private agencies. Provisions shall be made for the deposition of scientifically valuable archaeological materials removed from the site with responsible public or private institutions. In all cases, the City shall seek responsible scientific advice and make the necessary decisions consistent with the public interest.

Procedures

The following procedures shall be used in examining and reporting if the Planning Director deems it necessary, there shall be a walk-over site survey and, if warranted, a pre-grading conference prior to the commencement of any land alterations. The following procedures shall be used in examining and reporting possible archaeological sites.

1. Procedures and Findings

    a. Records: Demonstrate that a records check was completed. The results should be stated in the text of the final report.

b. Background: Provide background information (with sources referenced) that summarizes the significance of the scientific, cultural, and historical perspectives of the project area.

c. On-Site Survey: Make the following descriptions in sufficient detail to allow verification of work:

- Surface and subsurface reconnaissance methods.
- A list of personnel and affiliation.
- Date and location of research.
- The area's survey conditions that may have an effect on archaeological findings.
- Observations, data, and a description of any archaeological resources found.
- The location of material and data collected.
- Notification of professionals in related disciplines where necessary, such as Historians and Paleontologists.

d. Evaluation, description, and significance of direct and indirect impacts.

2. Identify Development Alternatives

a. Site Preservation Methods

- Revise construction or development plans in the event of an exceptional site that is worthy of preservation and/or nomination to the National Registry (Historic Preservation Act of 1966).

- Take the steps listed below in the event that development occurs in areas adjoining the site and that would involve potential impact by virtue of this proximity: protect the site by adequate means, such as fencing or other approved measures; stabilize where indicated; restore areas that are damaged as a result of proximity of the impact source.

- Restore where applicable

- Archaeological excavation

- A full-scale, research-oriented excavation that is properly planned and organized, adequately funded, and conducted in sufficient time is the preferred method of partial mitigation. The consultant's proposal to the City, included in the EIR, should contain, in detail, costs, procedures, time requirements, and a statement of the importance of the work to be performed. This proposal may then be included in a conditional permit or be required prior to the issuance of a permit.

- Emergency salvage excavation is the least preferred method of partial mitigation. The result of poorly planned excavation salvage techniques constitute an adverse impact on archaeological resources and represent the irreplaceable loss of a site.

3. Qualification of Consultants.

    - Provisional to professional licensing, minimum qualifications for consulting archaeologists shall be satisfied by their listing in the Directory of Archaeological Consultants, available from the Society for California Archaeology, or the list of certified archaeologists maintained by the County of Orange. Verification regarding qualifications shall be made by the Planning Director.

3.0 EXISTING CONDITIONS

3.1 NATURAL SETTING

The project site is located west of the current Newport Bay at the northwestern edge of the San Joaquin Hills, approximately one mile southeast of the mouth of the Santa Ana River. The City of Costa Mesa and the current project site sit on the uplifted coastal bluffs surrounding the bay.

The project area is located on the northern end of the Peninsular Range Geomorphic Province. These rocks are composed of pre-Cretaceous (more than 65 million-year-old) igneous and metamorphic rock with limited exposures of post-Cretaceous sedimentary deposits. However, these sedimentary deposits in coastal Orange County are considered to be some of the most important fossil-producing formations in the world (Strudwick and Goodwin 2008).

Surface deposits on the project area consist of exposures of marine Quaternary terrace deposits with a mixture of terrestrial components. Underlying this, and exposed in the cliffs below the terraces, are the marine Late Miocene Capistrano and Monterey Formations. All have produced fossils nearby (McLeod 2009).

The project site has been heavily graded in the past. The mesa that at one time extended nearly to West Coast Highway has been largely removed, leaving evidence of quarrying and remnants of the mesa in the northwestern third of the project site; a gently rising slope from West Coast Highway inland to the northeast in the middle third of the project site; and (3) a flat, graded pad in the southeastern third of the site.

3.2 CULTURAL SETTING

3.2.1 Prehistoric

Several chronologies are generally used to describe the sequence of the later prehistoric periods of Southern California. William Wallace (1955) developed the first comprehensive California chronologies and defines four periods for the southern coastal region. Wallace's synthesis is largely "descriptive and classificatory, emphasizing the content of archaeological cultures and the relationships among them" (Moratto 1984:159). Wallace relies upon the concept of "cultural horizons", which are generally defined by the temporal and spatial distribution of a set of normative cultural traits, such as the distribution of a group of commonly associated artifact types. As a result, his model does not allow for much cultural variation within the same time period, nor does it provide precise chronological dates for each temporal division. Nonetheless, although now more than 50 years old, the general schema of the Wallace chronology has provided a general framework for Southern California prehistory that remains valid today.

Horizon I: Early Man or Paleo-Indian Period (11,000 BCE to 7,500 BCE). While initially termed Early Man Horizon (I) by Wallace (1955), this early stage of human occupation is commonly referred to as the Paleo-Indian Period today (Chartkoff and Chartkoff 1984:24). As discussed above, the precise start of this period is still a topic of considerable debate. At inland

archaeological sites, the surviving material culture of this period is primarily lithic, consisting of large, extremely well made stone projectile points and tools such as scrapers and choppers. Encampments were probably temporary, located near major kills or important resource areas. The San Dieguito Tradition, defined by Warren at the stratified C.W. Harris site in San Diego County, is encompassed by this period of time (Moratto 1984:97).

Horizon II: Milling Stone Assemblages (7,500 BCE to 1,000 BCE). Encompassing a broad expanse of time, the Milling Stone Period was named for the abundant millingstone tools associated with sites of this period. These tools, the mano and metate, were used to process small, hard seeds from plants associated with shrub-scrub vegetation communities. An annual round of seasonal migrations was likely practiced, with movements coinciding with ripening vegetal resources and the periods of maximal availability of various animal resources. Along the coast, shell midden sites are common site types. Some formal burials, occasionally with associated grave goods, are also evident. This period of time is roughly equivalent to Warren's (1968) Encinitas Tradition. Warren (1968) suggests that as millingstones are common and projectile points are comparatively rare during this period of time, hunting was less important than the gathering of vegetable resources.

More recent studies (Koerper 1981; Koerper and Drover 1983) suggest that a diversity of subsistence activities, including hunting of various game animals, were practiced during this period. At present, little is known about cultural change during this time period within Southern California. While this lack of noticeable change gives the appearance of cultural stasis, almost certainly many regional and temporal cultural shifts did occur. Future research that is focused on temporal change within the Milling Stone Period would greatly benefit the current understanding of Southern California prehistory.

Horizon III: Intermediate Cultures (1,000 BCE to 750 CE). The Intermediate Period is identified by a mixed strategy of plant exploitation, terrestrial hunting, and maritime subsistence strategies. Chipped stone tools, such as projectile points, generally decrease in size, but increase in number. Abundant bone and shell remains have been recovered from sites dating to these time periods. In coastal areas, the introduction of the circular shell fishhook and the growing abundance of fish remains in sites over the course of the period suggest a substantial increase in fishing activity during the Intermediate Horizon. It is also during this time period that mortar and pestle use intensified dramatically. The mano and metate continued to be in use on a reduced scale, but the greatly intensified use of the mortar and pestle signaled a shift away from a subsistence strategy based on seed resources to that of the acorn. It is probably during this time period that the acorn became the food staple of the majority of the indigenous tribes in Southern California. This subsistence strategy continued until European contact. Material culture became more diverse and elaborate and included steatite containers, perforated stones, bone tools, ornamental items, and asphalt adhesive.

While Warren (1968) recognized the start of the Campbell Tradition within the Santa Barbara region at roughly the beginning of Intermediate Period, he did not see clear evidence of cultural change farther south. As a result, the Encinitas Tradition in Southern California encompasses both the Milling Stone and Intermediate Periods in Warren's chronology (1968:2, 4). However, the more recent chronological schema by Koerper and Drover clearly recognizes an Intermediate Period within Southern California. They suggest that Warren's inability to recognize an intermediate cultural stage was likely due to "the lack of conclusive data in 1968" (1983:26).

Horizon IV: Late Prehistoric Cultures (750 CE to 1769 CE). During the Late Prehistoric Period, exploitation of many food resources, particularly marine resources among coastal groups, continued to intensify. The material culture in the Late Prehistoric Horizon increased in complexity in terms of the abundance and diversity of artifacts being produced. The recovery and identification of a number of small projectile points during this period likely suggests a

greater utilization of the bow and arrow, which was likely introduced near the end of the Intermediate Period. Shell beads, ornaments, and other elements of material culture continue to be ornate, varied, and widely distributed; the latter evidence suggests elaborate trade networks. Warren's (1968) scheme divides the late prehistoric period into several regional traditions. Western Riverside County, Orange County, and the Los Angeles Basin area are considered part of the "Shoshonean" tradition, which may be related to a possible incursion of Takic speakers into these areas during this period. The Late Prehistoric Period includes the first few centuries of early European contact (1542–1769 CE); it is also known as the Protohistoric Period as there was a low level of interaction between native Californians and Europeans prior to Portolá's overland expedition in 1769.

In the few centuries prior to European contact, the archaeological record reveals substantial increases in the indigenous population (Wallace 1955:223). Some village sites may have contained as many as 1,500 individuals. Apparently, many of these village sites were occupied throughout the year rather than seasonally. This shift in settlement strategy was likely influenced by improved food procurement and storage technology, which enabled population growth and may have helped stimulate changes in sociopolitical organization.

Ethnographic

The project area is located in an area that was occupied during the Late Prehistoric Period by the Native American societies commonly known to anthropologists as the Juaneño and the Gabrielino (Kroeber 1925; Bean and Shipek 1978; Bean and Smith 1978). The name "Juaneño" denotes those people who in historic times were administered by the Spanish from Mission San Juan Capistrano. Many contemporary Juaneño identify themselves as descendents of the indigenous people living in the local San Juan and San Mateo Creek drainage areas, termed the Acjachemen Nation. While the term "Gabrielino" identifies those Native Americans who were under the control of the Spanish Mission San Gabriel, the overwhelming number of people here were of the same ethnic nationality and language group, and they generally referred to themselves as *Tongva*. Their territory extended from northern Orange County north to the San Fernando Valley in Los Angeles County. The terms the Native Americans in Southern California used to identify themselves have, for the most part, been lost; therefore, the names do not necessarily identify specific ethnic or tribal groups.

The two groups are broadly similar, but there are sufficient differences in Gabrielino and Juaneño language, ritual observances, and material culture to justify their identification as separate social groups (Bean and Smith 1978).

Cultural Resources Literature Review

Patrick Maxon, RPA of BonTerra Consulting conducted a literature review of documents on file at the South Central Coastal Information Center (SCCIC) at the California State University, Fullerton on February 2, 2009. The review consisted of an examination of the U.S. Geological Survey (USGS) 7.5-minute Newport Beach, California Quadrangle and its Mylar overlays to evaluate the project area for any sites recorded or cultural resources studies conducted in the parcel and within a 1-mile radius.

In summary, three cultural resources are recorded within the project area and five cultural resources studies have at least partially impinged on the current project area. Eighteen cultural resources are recorded within approximately 1 mile of the project area, and there have been a total of 38 cultural resources investigations within 1 mile.

Table 1 lists and briefly describes the cultural resources within the project area. These sites are, in reality, a part of the adjacent Banning Ranch property to the west, but are being considered

here because they fall into an area that will become an access road through the Banning Ranch property to reach the Sunset Ridge Park project area.

TABLE 1
CULTURAL RESOURCES WITHIN THE PROJECT SITE

Trinomial	Recorder/Year	Comment
CA-ORA-1601H	Smith et al./1998	Historic trash scatter
CA-ORA-1602H	Smith et al./1998	Historic trash scatter
CA-ORA-1610H	Smith et al./1998	Historic trash scatter/World War II gun emplacement site

Three of the previously mentioned cultural resources studies that included at least a part of the current project area included in the discussion of these sites. Drover and Smith (1999) is the survey report that documents the discovery of the three sites; Drover and Smith (2000) is a research design that describes the recommended evaluation of the sites; and Strudwick and Goodwin (2008), a document not on file at the SCCIC, is an assessment of the adjacent Banning Ranch project that included a discussion of the sites. This report documented the continued presence of the three sites in question and recommended evaluation of all three. Testing of CA-ORA-1601 and CA-ORA-1602 (trash deposits) was recommended to include surface collection and subsurface excavation of shovel test pits (STPs). Recommendations for CA-ORA-1610 (World War II gun emplacement) include additional historic research into the history and development of the site, and mechanized field testing of the site via backhoe trenches. Monitoring is recommended for all three sites.

Native American Scoping

Native American groups may have knowledge about cultural resources in the area and may have concerns about adverse effects to cultural resources from the project. These resources may be sacred lands, traditional cultural places and resources, and archaeological sites. On January 30, 2009, BonTerra Consulting received a reply to its Sacred Lands File (SLF) request from the Native American Heritage Commission (NAHC). The SLF search did indicate the presence of Native American cultural resources on the property. The NAHC also provided a list of tribal affiliations in the area. BonTerra Consulting notified those tribes by mail of the proposed project and invited their comments or questions regarding the proposed project. The individuals listed by the NAHC and contacted by BonTerra Consulting are as follows:

David Belardes, Chairperson, Juaneño Band of Mission Indians Acjachemen Nation;

Anthony Morales, Chairperson, Gabrielino/Tongva San Gabriel Band of Mission Indians;

Sam Dunlap, Tribal Secretary, Gabrielino/Tongva Council/Gabrielino Tongva Nation;

Anthony Rivera, Chairman, Juaneño Band of Mission Indians Acjachemen Nation; and

Sonia Johnston, Tribal Vice Chairperson, Juaneño Band of Mission Indians.

Three telephone responses were received. On March 2, 2009, Joyce Perry, calling on behalf of David Belardes, Chairperson, Juaneño Band of Mission Indians Acjachemen Nation, requested that an Archaeological Monitor be present on site during ground-disturbing activities. A Native American Monitor should also be included in the event of a cultural resources discovery (Perry 2009).

A second call was received from Alfred Cruz on April 22, 2009, on behalf of Sonia Johnston of the Juaneño Band of Mission Indians. He had questions about existing cultural resources

recorded on the site, and wanted to make sure everyone was aware that this area is sensitive for the presence of burials. He recommended archaeological and Native American monitoring of ground disturbance during any grading activities (Cruz 2009).

The final call was from Anthony Morales, Chairperson, Gabrielino/Tongva San Gabriel Band of Mission Indians. According to Mr. Morales, Gabrielino oral history suggests that they made use of the ocean and bluffs of the area and that burial could be present. He recommended archaeological and Native American monitoring of grading.

On June 7, 2009, an email was received from Andy Salas, Gabrielino Band of Mission Indians. The Gabrielino Band of Mission Indians was not a listed party on the NAHC contact list, and they did not receive a notification letter from BonTerra Consulting. Mr. Salas states that the tribe is in receipt of the Sunset Ridge Park EIR, and because the project is near or on a culturally sensitive area, the tribe requests to be used for Native American monitoring.

Field Check

On February 27, 2009, Mr. Maxon visited the project area to evaluate existing conditions at the site. The project site was physically examined in a cursory fashion; modern and historic photographs and maps were consulted; the three recorded site areas were visited; and photographs were taken. The following was noted:

> After comparing the current project site to older photographs and topographic maps of the site area, it is obvious that enormous amounts of sediment and soils were removed from much of the surface of the project site at some time in the past. The bluffs that at one time extended nearly to West Coast Highway have been largely removed from the project site. This would have obliterated or at least severely disturbed any archaeological sites that may have at one time existed there; however, paleontological sensitivity is still high as fossil localities have recently been recorded on the project site.

CA-ORA-1601 is recorded on the DPR 523 form as a “partially buried trash scatter eroding out of the roadway entering the pad from the south”. Strudwick and Goodwin (2008) report the site in much the same condition as originally recorded by Drover and Smith (1999). The site was relocated during the current field check, and a few fragments of historic material, chiefly bottle glass, were noted. The field check revealed that the site was in much the same condition as reported by Strudwick and Goodwin (2008:61).

CA-ORA-1602 is recorded as a “partially buried historic trash dump eroding out of the southwest facing wall of a moderately wide steep-walled drainage”. This deposit was relocated and appeared as described previously (Drover and Smith 1999; Strudwick and Goodwin 2008).

CA-ORA-1610 is recorded as the location of a World War II gun emplacement. It is located on the terrace above CA-ORA-1601 and CA-ORA-1602. The existing site record (Smith et al. 1998) includes all three sites, with CA-ORA-1601 and CA-ORA-1602 included as loci to the gun emplacement site. It was previously assumed to be entirely destroyed. This conclusion is supported by the facts that the mesa top is devoid of cultural material, the entire terrace has been graded flat, and both the northern and southern ends of the terrace have had portions cut away.

Recent Archaeological Investigation

As part of the currently proposed City of Newport Beach Banning Ranch development project, located adjacent to the current Sunset Ridge Park project site, BonTerra Consulting completed

an archaeological test excavation of 11 archaeological sites present on the Banning Ranch property in June 2009. Three of the 11 sites were CA-ORA-1601, CA-ORA-1602, and CA-ORA-1610. CA-ORA-1601 and CA-ORA-1602 were subjected to test excavations during the study and CA-ORA-1610 was further studied through historic research and on the ground survey. BonTerra Consulting is currently preparing the technical report for the aforementioned excavation work.

CA-ORA-1601

This site is approximately 0.4 kilometer (km) east of the West Coast Highway entrance to the West Newport Oil field (Armstrong Oil), also known as Banning Ranch, on the eastern bank of a broad drainage that runs beneath West Coast Highway. The site lies on the edge of a highly eroded, graded upland flat, which upon surface inspection yielded 4 artifacts associated with the early 20th century. In addition to surface inspection, shovel test pits (n=2) were excavated at the site at a three-meter interval, resulting in no positive tests or evidence of subsurface deposits within an area measuring approximately ten meters in diameter. No intact cultural lenses or structural remains were present. Material recovered included one milk glass cold cream jar, two amethyst glass bottle finishes, and one aqua glass bottle base.

CA-ORA-1602

This site is approximately 0.4 km east of the West Coast Highway entrance to the West Newport Oil field (Armstrong Oil), also known as Banning Ranch, on the eastern bank of a broad drainage that runs beneath West Coast Highway. This site lies on the slope of a highly eroded, graded upland flat, which upon surface inspection yielded 49 artifacts associated with the late 19th/20th centuries. In addition to surface inspection, one shovel test pit was dug, resulting in one positive test.

Subsurface artifacts were encountered at 0 to 80 centimeters (cm) below the surface. Two dark amber ("black glass") bottle bases with pontil scars represent the middle to late 19th century, while the remainder of the assemblage is dominated by ceramic and glass bottle fragments from the early 20th century. Building material, including nails, brick fragments and window glass, were recovered. Charcoal, ash, and fire-affected artifacts were present at 60 to 80 cm, representing a discrete cultural lens within the site. No other area proved to be culturally intact.

Materials recovered include 11 amethyst glass shards; 14 aqua glass shards; 21 amber glass shards; 66 clear glass shards; 2 milk glass shards; 1 cobalt glass shard; 2 green glass shards; 8 olive glass shards; 35 white ware/ironstone sherds; 10 porcelain sherds; 6 salt glazed stoneware sherds; 1 earthenware sherd; 10 mammal bones; 31 miscellaneous building materials; 55 miscellaneous metals; and 1 glass faux pearl hatpin mount.

CA-ORA-1610

This site's recorded location is on the mesa top directly above sites CA-ORA-1601 and CA-ORA-1602, which are included in the site record (Smith et al. 1998) as separate loci of the overall site. Field reconnaissance of the site strongly suggests that this was indeed the location of the World War II gun emplacement. Found in a small arroyo adjacent to the site is the remnants of an omega-shaped concrete anchor used to hold the gun in place and still embedded in a larger concrete slab. However, a comparison of current with historic maps and photographs shows that up to 20 feet of the top of the mesa that supported the gun, as well as the entire northern and southern portions of the mesa itself, has been removed. This likely occurred during oil extraction operations. Therefore, there is little chance that any of the gun emplacement and associated trenches and ammunition storage spaces remains at the site.

Given these results, none of these sites appear to possess the integrity or distinction to warrant listing in the NRHP or the CRHR.

4.0 IMPACT ANALYSIS

The comparison of the Project site to older photographs and topographic maps of the area demonstrates that it has been subject to sediment and soil removal. These excavations likely obliterated or at least severely disturbed any archaeological sites that may have at one time existed there. The purpose of the records search conducted at the SCCIC was to determine if any reports have been submitted that document the presence or absence of historic resources on the Project site. The records search provides information about known resources and previous studies for the site. Additionally, archaeological testing was conducted on the three known site. No known significant historical resources are present. The gun emplacement site (CA-ORA-1610H) has been removed from its former location by grading of the mesa top on which it stood. CA-ORA-1601H and CA-ORA-1602H were tested and determined to not be significant or eligible for listing on the NRHP or CRHR. However, historical and archaeological sites are known to exist in the City. Therefore, there is a potential for disturbance of undiscovered resources during grading activities. Implementation of Mitigation Measure (MM) 1 (archaeological monitoring) would reduce this impact to a level considered less than significant.

Threshold d) Would the project disturb any human remains, including those interred outside of formal cemeteries?

There is no indication that there are burials present on the Sunset Ridge Park project site. However, Native American tribes typically state that ancestors were often buried in coastal locations and much evidence exists to support this supposition. In the unlikely event that human remains are discovered during construction activities, MM 2, which addresses procedures to follow in the event of a discovery of suspected human remains, would reduce proposed project impacts to human remains to a less than significant level.

5.0 MITIGATION PROGRAM

MM 1 Prior to the issuance of any grading permit, the Contractor shall provide written evidence to the City Planning Department that the Contractor has retained a qualified Archaeologist to observe grading activities and to salvage and catalogue archaeological resources, as necessary. The Archaeologist shall be present at the pre-grade conference; shall establish procedures for archaeological resource surveillance; and shall establish, in cooperation with the Contractor, procedures for temporarily halting or redirecting work to permit the sampling, identification, and evaluation of the artifacts, as appropriate. If the archaeological resources are found to be significant, the archaeological observer shall determine appropriate actions, in cooperation with the City and project Contractor, for exploration and/or salvage. These actions, as well as final mitigation and disposition of the resources, shall be subject to the approval of the Planning Director.

Based on their interest and concern about the discovery of cultural resources and human remains during project grading, consideration should also be given to retaining a Native American Monitor to observe some or all grading activities.

Nothing in this mitigation measure precludes the retention of a single, cross-trained observer, qualified to monitor for both archaeological and paleontological resources.

MM 2 In accordance with *California Health and Safety Code*, Section 7050.5, if human remains are found, the County Coroner shall be notified within 24 hours of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has determined, within two working days of notification of the discovery, the appropriate treatment and disposition of the human remains. If the County Coroner determines that the remains are or believed to be Native American, s/he shall notify the NAHC in Sacramento within 48 hours. In accordance with California PRC, Section 5097.98, the NAHC must immediately notify those persons it believes to be the most likely descended from the deceased Native American. The descendents shall complete their inspection within *48 hours of being granted access to the site*. The designated Native American representative would then determine, in consultation with the property owner, the disposition of the human remains.

Patrick O. Maxon, RPA
Director, Cultural Resources

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PALEONTOLOGICAL RESOURCES TECHNICAL REPORT

SUNSET RIDGE PARK PROJECT NEWPORT BEACH, CALIFORNIA

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October 2009

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EXECUTIVE SUMMARY

The construction of the proposed Sunset Ridge Park, located within the city limits of Newport Beach, would involve grading, slope modification, construction of buildings and other facilities, and landscaping. Because of the nature of this type of construction, the presence of known paleontological resources and the possibility of unrecorded paleontological resources, the State of California and other governmental agencies require a paleontological review pursuant to the requirements of the California Environmental Quality Act (CEQA) and other legislation. BonTerra Consulting conducted a Phase II paleontological study, consisting of a records search and literature review, and a limited field reconnaissance in order to (1) evaluate the sensitivity of the substrate underlying the proposed development for the presence of fossil resources and (2) make recommendations to mitigate potential Project effects on those resources.

The Phase II study established that four lithologic units underlying the proposed development have been mapped. These units range in age from late Miocene to Holocene and consist of Tertiary Monterey Formation (Tm), Quaternary marine terrace deposits (Qtm), Quaternary younger alluvium (Qa), and Quaternary aeolian deposits. The records search of the Natural History Museum of Los Angeles County Vertebrate Paleontology's (LACM) and Invertebrate Paleontology's (LACMIP) collections did not reveal the presence of any previously recorded fossil sites in Monterey Formation and Quaternary marine terrace deposits, but the field survey revealed at least three distinct fossil shell beds in the Quaternary marine terrace deposits in the large road cut and bluff along Superior Avenue. Although no fossils from the Monterey Formation have been reported from this area and no fossils were observed during the field survey, the Monterey Formation has yielded significant fossils in other areas of Orange County. The Quaternary younger alluvium and aeolian deposits may be too young to yield fossils. Therefore, the Monterey Formation and Quaternary marine terrace deposits are considered to have high paleontological sensitivity, while the Quaternary younger alluvium and aeolian deposits are of low paleontological sensitivity.

To ensure that impacts to the paleontological resources will be mitigated to a less than significant level, mitigation is required.

1.0 INTRODUCTION

This report addresses the proposed construction of Sunset Ridge Park in the Newport Beach area of Orange County, California. This paleontological report, prepared by Mark A. Roeder of BonTerra Consulting, an Orange County Certified Paleontologist, presents archival information that satisfies California Environmental Quality Act (CEQA) and other environmental requirements with respect to paleontological resources. The purpose of the report is to (1) provide a paleontological assessment of scientifically important fossil resources occurring within project boundaries; (2) specify procedures for preconstruction sampling and documentation and later construction monitoring activities; and (3) describe the methods for collecting and curating any scientifically important fossils that may be discovered during the course of work.

The proposed Sunset Ridge Park Project consists of the development of an approximate 18.9-acre property, involving grading or earth-moving activities for building pads, rights-of-way for roads, slope modification, and landscaping. The property is underlain by three sedimentary deposits or rock units that range in age from Late Miocene to Holocene that accumulated in the Los Angeles Basin.

1.1 PALEONTOLOGICAL RESOURCES

A rock unit's paleontological resources encompass any evidence preserved in the rock of once-living organisms. This pertains to fossils preserved either as impressions of soft or hard parts; mineralized remains of hard parts; tracks, burrows, or other trace fossils; coprolites; seeds or pollen; and other microfossils. These organisms may have been terrestrial, aquatic, or aerial in life habit.

Fossils are an important resource to science as they are useful in demonstrating and documenting the evolution of particular groups of organisms. Fossil remains enable geologists to reconstruct the past environment in which the organisms lived and hence the environment during the deposition of the rock unit. Fossils are also extremely useful in determining the age of the rock in which they are preserved. Paleontological resources include fossil remains, fossil localities, and formations that have produced previously recorded fossil material in nearby areas. A paleontological resource is a limited, nonrenewable, sensitive, scientific, educational resource afforded protection under federal laws and regulations designed to preserve environmental quality. In the State of California, paleontological resources are offered protection under CEQA and other similar legislation.

1.2 METHODS

The City of Newport Beach has adopted paleontological guidelines (Policy # K-4, adopted on August 26, 1974, amended on January 24, 1994, and corrected on March 22, 1999) which govern the identification and evaluation of these resources and are used to guide the development or redevelopment of lands within the City. The following discussion is adapted from the City Council Policy Manual guidelines.

1. The City shall, through its planning policies and permit conditions, ensure the preservation of paleontological resources and require that the impact caused by any development be mitigated in accordance with CEQA.

2. The City shall prepare and maintain sources of information regarding paleontological sites and the names and addresses of responsible organizations and qualified individuals who can analyze, classify, record, and preserve paleontological findings.

3. If determined to be necessary by the Planning Director, it shall be the responsibility of a landowner or developer prior to the commencement of land development to cause the proposed site to be examined to determine the existence and extent of paleontological resources. The examination shall be by qualified observers approved by the City. The observers shall prepare and submit to the City a written report describing findings and making recommendations for further action. The report shall discuss both positive and negative aspects of the effects of the proposed development on paleontological resources. The report shall be considered part of the CEQA review process and, if appropriate, the recommendations shall be included as mitigation measures and conditions of approval for the Project.

4. Based on the report and recommendations of the observers, the City shall take such steps as are necessary to assure that any findings or sites are recorded, preserved, and protected. These steps may include requirements that the landowner or developers incur reasonable expenditures of time or money, encouragement for appropriate volunteer or non-profit organizations to become involved, or acquisition of the sites by public or private agencies. Provisions shall be made for the deposition of scientifically valuable paleontological materials removed from the site with responsible public or private institutions. In all cases, the City shall seek responsible scientific advice and make the necessary decisions consistent with the public interest.

Procedures

The following procedures shall be used in examining and reporting on possible paleontological sites.

1. The site examination shall consist of:

    a. A walk-over site survey;

    b. A review of publications and reports on the geology or paleontology of the area;

    c. Analysis of all available soils information; and

    d. Examination of the proposed development site's relationship to known or potential fossil-producing areas identified in available records.

2. Prior to the commencement of any land alterations, the Planning Director shall determine whether a pre-grading conference is required based on an analysis of the potential for a paleontological discovery to occur, as follows:

    a. If the Planning Director determines that it is unlikely that any paleontological discovery would occur, a pre-grading conference may be waived.

    b. Otherwise, the pre-grading conference shall be required.

3. During the pre-grading conference, the Planning Director shall ensure that:

    a. A responsible organization (e.g., the Natural History Foundation of Orange County), is notified and that a qualified representative is authorized to participate in the conference;

    b. The grading schedule provides for identification and avoidance of resource discoveries to allow their immediate recovery;

c. A qualified observer or collector is available to monitor the site during grading operations (Any observer included on the County of Orange list of certified paleontologists will be considered to be qualified);

d. A copy of the grading schedule is available to the appropriate parties, including the on-site observer;

e. The observer has adequate authority to institute temporary delays or alterations in the grading schedule to allow collection of paleontological material(s);

f. The grading contractor clearly understands the observer's role and authority;

g. The responsible parties are notified and ready on a 24-hour notice to respond if a resource discovery is uncovered;

h. Adequate insurance has been provided for protection of the observer, the property owner, and the developer; and

i. In the event any paleontological materials having scientific value are discovered, reasonable provisions are made for extraction and preservation.

Record searches of the paleontological collections of regional museums were conducted to evaluate whether previous records of formal fossil localities exist on or within a one-mile radius of the Project. Mr. Roeder conducted record and literature searches of the LACM and LACMIP paleontological collections and archives in order to determine if any previously recorded fossil localities were in the proposed Project's study area. Mr. Roeder reviewed geologic and paleontological literature including reports, papers, and maps that cover the limits of the Project, and conducted a paleontological field reconnaissance of the Project area.

Conkling and Michalsky (2005) conducted a field survey for the study area and incorporated the results into a paleontological assessment. On August 2, 2009, Mr. Roeder conducted a field survey for paleontological resources on the property.

2.0 UNDERLYING GEOLOGY

The geology of the study area has been summarized by Poland et al. (1956), Morton and Miller (1981), Rogers (1966), and Vedder (1975). The proposed Sunset Ridge Park site is underlain by Late Miocene to Holocene sedimentary deposits (Figure 1). There are four distinct stratigraphic units present in the proposed Sunset Ridge Park parcel. The Tertiary Monterey Formation (Tm), Quaternary marine terrace deposits (Qtm), Quaternary younger alluvium (Qal), and Quaternary aeolian (Qe) deposits. The Monterey Formation is exposed in cuts along West Coast Highway and near the intersection of West Coast Highway and Superior Avenue. The Quaternary marine deposits are present in cutslopes and bluffs facing Superior Avenue and in road beds on the western boundary of the property. The Quaternary younger alluvium and aeolian deposits cover portions of two basic rock units.

2.1 YOUNGER SURFICIAL DEPOSITS

2.1.1 Quaternary Younger Alluvium (Qal)

Overlying the Quaternary marine terrace deposits, the Quaternary younger alluvium consists primarily of thick soil horizon. Even though the age of these sedimentary deposits increases with depth, they are less than 10,000 years old and do not usually yield fossils.

2.1.2 Quaternary Aeolian Deposits (Qe)

The Quaternary aeolian deposits consist primarily of unconsolidated dune sands (Conkling and Michalsky 2005) that are very young in age (late Holocene) and do not usually yield fossils.

2.2 OLDER SURFICIAL DEPOSITS

2.2.1 Tertiary Monterey Formation (Tm)

Underlying the Quaternary marine terrace deposits, the Monterey Formation is exposed in cuts along West Coast Highway and the lower portion of Superior Avenue. The Monterey Formation rocks were deposited in fairly deep, offshore marine waters some 12 to 14 million years ago (Bramlette 1946). These rocks are found widely distributed in and near the Coast Ranges from Berkeley to San Clemente in California, and in most areas are thousands of feet thick. The Monterey Formation varies a great deal in thickness and lithology, which makes it hard to make generalizations on the formation as a whole. These marine sediments also vary in particle size; rock types include chert, laminated chert, chert shale, diatomite, porcelaneous shale and mudstone, diatomaceous mudstone and shale, radiolarian mudstone, shales, sands, sandstones, mudstones, gravel, conglomerate, and limestone (Bramlette 1946).

In Orange County, the Monterey Formation varies in thickness from several hundred feet in the foothills of the Santa Ana Mountains to 15,000 feet in the Newport Beach and Irvine areas (Vedder 1975). Lithologies vary from sandstones to mudstones.

In the Newport Beach area, the Monterey Formation is well exposed in Upper Newport Bay (Vedder 1975). Exposures on the Sunset Ridge Park site consisted of dark gray shales.

2.2.2 Marine Terrace Deposits (includes Palos Verdes Sand) (Qtm)

Along the eastern and western boundaries of the property overlying the rocks of the Monterey Formation are sediments that comprise the marine terrace deposits (Qtm). The most notable intervals within sedimentary formations are fossil shell-bearing horizons that are present over the entire length of outcrop along the road cut and bluff along Superior Avenue. Elsewhere, these horizons have been named the Palos Verdes Sand (Kennedy 1975; Tieje 1926; Woodring et al. 1946).

The Palos Verdes Sand was originally described in the Palos Verdes Hills and San Pedro area of Los Angeles County and was referred to as the upper portion of the “San Pedro Series” by Arnold and Arnold (1902) and later named the “Palos Verdes Formation” by Tieje (1926). Later, Woodring et al. (1946) referred to these rocks as Palos Verdes Sand and defined this rock unit as only marine sand and gravels that occurred on the lowest emergent terrace in the Palos Verdes Hills of Los Angeles County, California. This name has been applied to similar deposits on the lowest emergent terrace in the Los Angeles Basin from Pacific Palisades to Newport Beach (Kennedy 1975).

3.0 EVALUATION OF PALEONTOLOGICAL RESOURCES

In order to assess the paleontological resources of the Sunset Ridge Park Project, all available maps, reports, and papers that pertain to the geology and paleontology of the lithologic units that underlie the proposed pipeline route were examined for documentation of fossil occurrences. The excavations for the Sunset Ridge Park Project, as understood, will involve grading for building pads and attendant facilities, slope modification, and landscaping. These large-scale excavation activities require paleontological mitigation measures.

3.1 POTENTIAL IMPACTS

Paleontological resources, including fossil remains and associated scientific data, fossil sites and fossiliferous rocks, could be affected by the direct and indirect environmental impacts accompanying the excavation activities for the construction of building pads, roads, parking lots, and slope modification.

Direct impacts would result from the ground-disturbing activities associated with construction and landscaping. If scientifically important paleontological resources are identified within the boundaries of the proposed Project, excavation and construction could disturb fossil-bearing and potentially fossiliferous rocks, which could result in the loss of paleontological resources, including scientifically important fossil remains, associated geologic data, fossil sites, and fossiliferous rocks. Although pipeline construction would be a short-term activity, the loss of fossil resources would be a permanent adverse environmental impact.

Easier access to fossil sites and the accompanying potential for unauthorized fossil collection by construction personnel, “rock hounds”, and amateur and commercial fossil collectors would not disturb fossiliferous rocks to a significant degree, but could result in the loss of additional fossil remains, associated scientific data, and fossil sites.

The potential significance level (high, low, unknown, or none) of these adverse impacts in a particular area is based on the paleontological sensitivity of the formation underlying the area and the potential for disturbing fossil localities and remains therein. The adverse impacts on any fossil locality containing identifiable remains, as well as on the fossiliferous bed that produced them, depends on the paleontological sensitivity of the formation in which the locality and bed occur, the extent of the impact, and the occurrence of other comparable remains nearby. Additionally, the feasibility of reducing impacts by scientific data collection must also be considered.

3.2 ASSESSMENT CRITERIA

A formation’s or unnamed sedimentary unit’s paleontological sensitivity, described as high, low, unknown or none, is the measurement most conducive to assessing the importance of the paleontological resources within the study area. The paleontological sensitivity of a formation reflects its potential productivity and the importance of the fossils it has produced in the area. The procedures utilized in this study to evaluate the paleontological resources of rock units are similar to those utilized by Wagner (1990, 1995).

A formation’s potential productivity is measured as high, low, unknown or none, based upon the densities of fossil specimens or localities within or near the study area. Exposures of a particular formation within the study area will most likely yield fossils similar in number and kind to those previously recorded from the formation in the surrounding area and may contain a similar density of fossil sites. The criteria for establishing the potential productivity of a formation exposed within the study area are described below:

- ***High potential:*** the formation contains a high density of fossils sites or has produced numerous remains locally and is very likely to yield additional remains.

- ***Low potential:*** poorly exposed or studied formation that contains a very low density of recorded fossil localities and has produced few remains locally. Further investigation could establish that it contains comparatively numerous localities and common fossil remains.

- ***Unknown potential:*** formation for which no data or insufficient data is available from the immediate vicinity to allow an accurate assessment of its potential for yielding important fossil remains within the study area.

- ***No potential:*** unfossiliferous igneous and metamorphic rock units with no potential for yielding any fossil remains or Recent to sub-Recent sedimentary deposits that are too young to yield organic fossil remains greater than 10,000 years old.

To evaluate the paleontological sensitivity for each formation exposed within the study area, the following procedures were utilized:

- The productivity of each formation was assessed based upon the densities of fossil localities and remains it has produced locally.

- The importance of the fossil remains recovered from each formation was assessed.

- The importance of fossil remains that might be recovered from a formation if different techniques were utilized to collect the fossils was assessed. This criterion is implemented due to the effectiveness of screen-washing large volumes of matrix followed by heavy liquid separation in extracting small fossil specimens where no fossils were previously observed.

Based on the above criteria, the Monterey Formation and surficial Quaternary deposits on the parcel are ranked by sensitivity rating on Table 1.

TABLE 1
PALEONTOLOGICAL SENSITIVITY OF THE LITHOLOGIC UNITS
UNDERLYING SUNSET RIDGE PARK

Lithologic Unit	Sensitivity
Monterey Formation	High
Quaternary marine terrace deposits	High
Quaternary younger alluvium	Low
Quaternary aeolian deposits	None

4.0 PALEONTOLOGICAL RESOURCE ASSESSMENT

The following is a description and evaluation of the resources found in each lithologic unit that is mapped on the Sunset Ridge Park Project site property.

4.1 TM-MONTEREY FORMATION

Underlying the marine terrace deposits are dark gray shales of the Monterey Formation This rock unit is present in road cuts along West Coast Highway and at the intersection of West Coast Highway and Superior Avenue. Elsewhere, based on sedimentary structures and variable lithologies, this rock unit was probably deposited in fairly deep offshore marine waters (Bramlette 1946). The upper contact of the Monterey Formation with the overlying Quaternary marine terrace deposits in exposures is an angular unconformity.

In the Orange County area, the Monterey Formation has yielded remains of fish and sharks (Savage and Barnes 1972; Roeder, unpublished data); marine mammal such as dolphins,

porpoises, sea lions, and whales (Downs 1955, Savage and Barnes 1972, Barnes 1976); and birds (Howard 1966, 1978).

The records and literature search revealed no previously recorded paleontological sites on the property, but the adjacent Hoag Hospital lower parking lots produced specimens of fossil marine mammals at LACM 6371 (McLeod 2009).

No fossils were observed in the Monterey Formation during the course of the paleontological survey.

4.2 QUATERNARY TERRACE DEPOSITS (QTM) (INCLUDING PALOS VERDES SAND)

Overlying the Monterey Formation and exposed primarily in road cuts and bluffs along Superior Avenue and along the western boundary of the property are outcrops of the Quaternary marine terrace deposits (Qtm). The most notable interval within the sedimentary formation is fossil shell-bearing horizons that are present over the entire length of the Superior Avenue cutslope and the western portion of the property. Elsewhere, these horizons have been named the Palos Verdes Sand (Kennedy 1975; Tieje 1926; Woodring et al. 1946).

In the past, construction has exposed a number of fossil outcrops in this rock unit. The rock unit consists of greenish-gray, fine- to medium-grained sand with traces of silt and clay, and is on the lowest emergent terrace in the Los Angeles Basin from Newport Beach to Pacific Palisades. Although primarily known for its fossil mollusks (Kennedy 1975), the Palos Verdes Sand has yielded remains of sharks; bony fish (Fitch 1964, 1966, 1969, 1970); birds; and marine mammals (Langenwalter 1975). In addition to the marine fossils, a number of large, extinct Ice Age land mammals such as mammoth, mastodon, bison, sloth, sabertooth cat, horse, and camel were revealed (Jefferson 1991b; Langenwalter 1975; Miller 1971). Smaller terrestrial vertebrates, including amphibians, reptiles, birds and small mammals, were also found. The Palos Verdes Sand is estimated to be at least 120,000 years old (Fanale and Schaeffer 1965) and represents a time when coastal waters off Southern California were several degrees warmer than today (Fitch 1970, Kennedy 1975).

Elsewhere in the Newport Beach and Costa Mesa area, the Palos Verdes Sand horizon of the Quaternary marine terraces deposits has been exposed in natural outcrops and man-made excavations. A number of fossil shell-bearing horizons have been found (Bruff 1945; Kanakoff and Emerson 1959; Peska 1976 and 1984; Powell et al. 2004); unfortunately, most of the Palos Verdes Sand exposures in the Los Angeles-Orange Counties area that were studied in the past have been destroyed during the construction of housing projects, shopping centers, roads, and freeways (Fitch 1966; Long 1993).

Although the records search (McLeod 2009) revealed no previously recorded fossil sites on the parcel, properties adjacent to the Sunset Ridge Park site have a number of known paleontological sites. During grading of the lower parking lot at Hoag Memorial Hospital, a fossil horse (*Equus*) (McLeod 2009) and a variety of marine shells were collected (LACMIP 4007) from a shell horizon (Palos Verdes Sand) in the Quaternary marine terrace deposits (Lander and Roeder 1997). Cooper (1980) and Langenwalter (1998**)** noted a number of Palos Verdes Sand sites in the Quaternary marine terrace deposits of the adjacent Banning Ranch. Some of these are Museum of Paleontology, University of California, Berkeley (UCMP) and Natural History Museum of Los Angeles County Invertebrate Paleontology sites (Bruff 1946). The intersection of 19th Street and Anaheim Avenue (LACM 3267) in Costa Mesa produced a specimen of a fossil elephant (McLeod 2009). UCMP V-93124 (Long 1993) and LACM 4219, located along State Route 55 near Santa Isabel Avenue, yielded a wealth of fossils during construction of the freeway: over 200 species of marine invertebrates (Mount 1981; Peska

1975); 41 species of marine fishes (Long 1993); a pond turtle; birds; and 7 kinds of mammal (marine and terrestrial), including Camel and Bison (Long 1993; McLeod 2009).

Some of the Quaternary marine terrace deposits in part may be non-marine. In similar deposits in Huntington Beach, large extinct mammals such as mammoth, horse, and bison were found (de Barros and Roeder 2001, 2009; Wake and Roeder, in press). Additionally, pond deposits dated at 40,000 years before present yielded more than 2,000 fossils specimens from the Quaternary marine terrace deposits. Virtually all of the specimens were recovered as a result of processing one ton of fossiliferous rock recovered from one fossil site. Fossils recovered included pollen and spores of 30 kinds of plants and trees; shells from 4 kinds of freshwater ostracods; 8 kinds of the shells of land and freshwater snails; a slug; a freshwater clam; bones of 2 species of freshwater/marine fish and 1 kind of freshwater fish; bones of 3 kinds of amphibians; bones of 12 kinds of reptiles; bones of 2 kinds of birds; and 10 kinds of small mammals (Wake and Roeder, in press.). These types of sites that produce small vertebrates are rare (Jefferson 1991a).

During the course of the paleontological survey, three distinct fossil shell-bearing horizons (BON 1, 2, and 3) were found in the large road cut along Superior Avenue and two other fossil shell-bearing horizons (BAN 5 and 6) were found in the proposed park access road right-of-way. These localities are depicted on Figure 1.

4.3 QUATERNARY YOUNGER ALLUVIUM (QA)

Because this rock unit may be less than 10,000 years old, it has little potential to yield true fossils. The records search (McLeod 2009) revealed no vertebrate sites on the parcel.

4.4 QUATERNARY AEOLIAN DEPOSITS (QE)

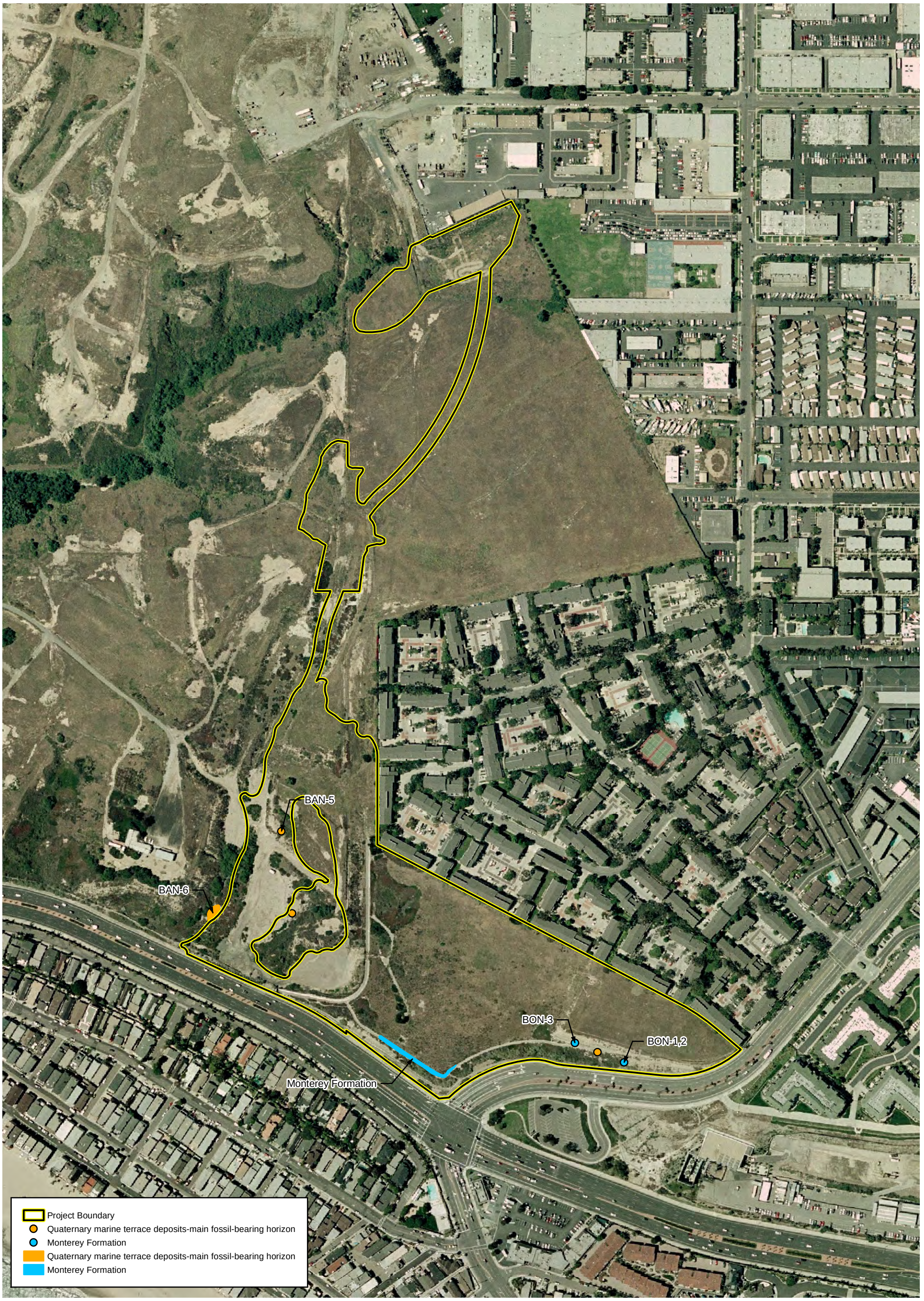
The Quaternary aeolian deposits consist primarily of unconsolidated dune sands (Conkling and Michalsky 2005) that are very young in age (late Holocene) and do not usually yield fossils. The records search (McLeod 2009) revealed no vertebrate sites on the parcel.

5.0 SUMMARY

The usual mitigation measures in a paleontological resources assessment call for paleontological monitoring during earth-moving activities associated with construction. Most properties do not have paleontological resources exposed at the surface and fossils are usually found during the earth moving as grading exposes the overlying geology. The Sunset Ridge Park site in many ways is unique. Paleontological resources are exposed in natural outcrops and road cuts over a portion of the property. Three prominent shell-bearing horizons in the Quaternary marine terrace deposits (elsewhere called the Palos Verdes Sand) can be traced in the large road cut along Superior Avenue, and two other fossil shell-bearing horizons are present in the park access road area on the western boundary of the property.

6.0 RECOMMENDED MITIGATION PROGRAM

The procedures recommended below will mitigate adverse impacts resulting from the earth-moving activities associated with the construction of the Sunset Ridge Park development and slope stabilization on the known paleontological resources to a less than significant level. These procedures will allow for the recovery and preservation of some highly significant fossil remains and associated scientific data that might otherwise be lost as a result of indiscriminate earth-moving activities associated with construction. The recommended level of mitigation effort in particular areas reflects the paleontological importance of the underlying rock unit, the type and



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Locations of Fossil Sites

Figure 1

Sunset Ridge Park

N
W E
S

300 150 0 300
Feet

BonTerra CONSULTING

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magnitude of the impact, and the potential for loss of fossil specimens and associated geologic data related to earth-moving activities and unauthorized fossil collections.

When appropriate mitigation measures are initiated, earth-moving activities could prove beneficial by exposing fresh rock and allowing fossil remains and associated data to be collected which otherwise might not have been, particularly with regard to sediments from which no remains have been previously recorded. Mitigation programs containing measures similar to those presented below have resulted in the recovery of abundant fossil remains in beds from which few or no remains had been previously reported. Moreover, these programs have usually caused little or no delay in construction.

This mitigation plan follows federal, State, and local agency mitigation requirements for protecting paleontological resources on lands under their respective jurisdictions and is based on the results of the archival and literature search. Its implementation would reduce adverse construction-related impacts on paleontological resources to a less than significant level.

MM 1 Prior to the issuance of any grading permit, the Contractor shall provide written evidence to the City of Newport Beach Planning Department that the Contractor has retained a qualified Paleontologist to observe grading activities and conduct salvage excavation of paleontological resources as necessary. The paleontologist shall be present at the pre-grading conference, shall establish procedures for paleontological resources surveillance, and shall establish, in cooperation with the City, procedures for temporarily halting or redirecting work to permit the sampling, identification and evaluation of the fossils as appropriate.

Any earth-moving activity associated with development, slope modification, or slope stabilization that requires moving large volumes of earth shall be monitored according to the paleontological sensitivity of the rock units underlying the affected area. All vertebrate fossils and representative samples of megainvertebrates and plant fossils shall be collected. Productive sites that yield vertebrates should be excavated, and approximately 2,000 lbs of rock samples should be collected to be processed for microvertebrate fossil remains. The Society of Vertebrate Paleontology (SVP) recommends that a standard sample of 6,000 lbs (Society of Vertebrate Paleontology 1995) be collected for microvertebrate sites. It is recommended that such a large volume only be required in very unique situations, such as in an area where no fossils have ever been reported and the results would greatly alter scientific interpretations of the area, or if the site is so rich that the diversity of known taxa (species) would be greatly enhanced by processing a larger volume.

If any scientifically important large fossil remains are uncovered during earth-moving activities, the Paleontologist shall divert heavy equipment away from the fossil site until s/he has had an opportunity to examine the remains. If warranted, a rock sample will be collected for processing. The Paleontologist shall be equipped to rapidly remove fossil remains and/or matrix (earth), and thus reduce the potential for any construction delays.

If scientifically important fossil remains are observed and if safety restrictions permit, the Construction Contractor shall allow the Paleontologist to safely salvage the discovery. At the Paleontologist's discretion, the Grading Contractor may assist in the removal of the fossil remains and rock sample to reduce any construction delays.

All fossils shall be documented in a detailed paleontological resource impact mitigation report. Fossils recovered from the field or by processing shall be prepared; identified; and, along with accompanying field notes, maps, and photographs,

accessioned into the collections of a designated, accredited museum such as the Natural History Museum of Los Angeles or the San Diego Natural History Museum.

Because of slope modification, fossil-bearing exposures of the Quaternary marine deposits may be destroyed. If feasible, a few stratigraphic sections with fossil-bearing horizons should be preserved for educational and scientific purposes.

The following are recommendations specific to each lithologic unit.

- ***Monterey Formation:*** A qualified Paleontologist shall be notified when earth-moving activities are anticipated to impact undisturbed deposits. The designated Paleontologist should visit the area of construction on a full-time basis to assess whether scientifically important fossils are exposed during construction activities. If fossil material is observed during construction, specimens shall be removed following standard paleontological protocols.

- ***Quaternary Marine Terrace Deposits:*** Prior to construction, a qualified Paleontologist shall collect exposed fossils from the three distinct fossil shell horizons (BON 1, 2, 3) exposed along the cut on Superior Avenue and the two other fossil shell-bearing horizons (BAN 5 and 6) in the proposed access road right-of-way. A bulk sample of at least 100 lbs per fossil site should be processed through fine screens to recover rare types of fossil marine mollusks, bony fish, sharks, reptiles, birds, and marine and terrestrial mammals. A detailed measured section, placing the fossil sites in a stratigraphic sequence, shall be made.

  A qualified Paleontologist shall be notified when earth-moving activities are anticipated to impact undisturbed deposits. The designated Paleontologist should be present on a full-time basis during construction activities to assess whether scientifically important fossils are exposed. If fossil material is observed during construction, specimens should be removed following standard paleontological protocols.

- ***Younger Alluvium and Aeolian Deposits:*** A qualified Paleontologist shall be notified when earth-moving activities are anticipated to impact undisturbed deposits. The designated Paleontologist should visit the construction area on a part-time basis to assess whether scientifically important fossils are exposed during construction activities. If fossil material is observed during construction, specimens should be removed following standard paleontological protocols.

Nothing in this mitigation measure precludes the retention of a single cross trained observer, qualified to monitor for both archaeological and paleontological resources.

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