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MEMORANDUM

DATE: January 16, 2026

TO: Joanna Cortez, Principal Planner, City of Huntington Beach

FROM: Kelly Vreeland, M.Sc., Senior Paleontologist

SUBJECT: Paleontological Resources Memorandum for the Palm/Goldenwest Specific Plan Amendment Project (LSA Project No. HBC2201.05)

INTRODUCTION

This memorandum documents the results of the paleontological analysis conducted for the proposed Palm/Goldenwest Specific Plan Amendment Project (project) in Huntington Beach, Orange County, California. This analysis was conducted to determine the potential for the project to impact paleontological resources in compliance with all applicable State and City of Huntington Beach (City) regulations and requirements regarding paleontological resources, as well as the standards of the Society of Vertebrate Paleontology (SVP, 2010). The applicable regulations and requirements include the California Environmental Quality Act (CEQA): Public Resources Code (PRC) Division 13, Chapter 2.6; the *State CEQA Guidelines*: California Code of Regulations, Title 14, Chapter 3, Appendix G; PRC Section 5097.5; and the Resources Element from the County of Orange General Plan (County of Orange, 2015). Information from this paleontological memorandum is intended for incorporation in the Environmental Impact Report (EIR) being prepared for this project.

The project area is depicted on the United States Geological Survey (USGS) *Seal Beach, California,* 7.5-minute topographic quadrangle in Township 6 South, Range 11 West, Sections 3 and 10, San Bernardino Baseline and Meridian (USGS, 1981; see Attachment B, Figure 1, Project Location and Vicinity). The project would involve amendments to the City of Huntington Beach General Plan, the Palm/Goldenwest Specific Plan (PGSP), and the Local Coastal Program in order to enable redevelopment of an approximately 92-acre portion of land within the PGSP (project site) that is currently used for oil and gas production. Refer to Figure 1 for the location of the project site within the regional and local context. The proposed project would facilitate the removal of existing oil and gas production infrastructure from the project site and the development of commercial, residential, and open space/park land uses, including up to 350 hotel rooms and up to 800 residential units. The maximum anticipated depth of excavation will be 13 feet for the subterranean parking garage.

GEOLOGY AND SOILS

Methods

To assess the impacts of the project with respect to paleontological resources, LSA reviewed geologic maps of the project site and relevant geological and paleontological literature to determine

which geologic units are present within the project site and whether fossils have been recovered within the project site or from those or similar geologic units elsewhere in the region. In addition, a fossil locality search was conducted through the Natural History Museum of Los Angeles County (NHMLA) to determine the status and extent of previously recorded paleontological resources within and surrounding the project site. On November 5 and 13, 2025, LSA conducted a pedestrian field survey of the project site. The purpose of the field survey was to document and collect any paleontological resources that may have been present, as well as to note the sediments at the surface.

Setting

Results of the literature review indicate that the project site is within the Peninsular Ranges Geomorphic Province, a 900-mile-long northwest-southeast trending structural block with similarly trending faults, that extends from the Transverse Ranges in the north to the tip of Baja California in the south and includes the Los Angeles Basin (California Geological Survey, 2002; Norris and Webb, 1976). The total width of this province is 225 miles, extending from the Colorado Desert in the east, across the continental shelf, to the southern Channel Islands (Santa Barbara, San Nicolas, Santa Catalina, and San Clemente) in the west (Sharp, 1976). This province is characterized by a series of mountain ranges and valleys that trend in a northwest-southeast direction roughly parallel to the San Andreas Fault Zone (Norris and Webb, 1976; Sharp, 1976). It contains extensive pre-Cenozoic (more than 66 million years ago [Ma]) igneous and metamorphic rocks covered by Cenozoic (less than 66 Ma) sedimentary deposits (Norris and Webb, 1976).

Geologic mapping by Saucedo et al. (2016) shows that the project site is underlain by Holocene (less than 11,700 years ago) Beach Deposits, and Middle to Late Pleistocene (774,000–11,700 years ago) Old Shallow Marine Deposits on Wave-Cut Surface. While not mapped by Saucedo et al. (2016), Artificial Fill is present from the prior construction of the area and was noted during the field survey. These geologic units and their paleontological sensitivities are described in more detail below. Dates for the geologic time intervals referenced in this report are derived from the *International Chronostratigraphic Chart* published by the International Commission on Stratigraphy (Cohen et al., 2024).

Artificial Fill

Artificial Fill consists of sediments that have been removed from one location and transported to another location by human activity, rather than by natural means. The transportation distance can vary from a few feet to many miles, and composition depends on the source and purpose. Artificial Fill will sometimes contain modern debris such as asphalt, wood, bricks, concrete, metal, glass, plastic, and even plant material.

Although Artificial Fill may contain fossils, these fossils have been removed from their original location and are thus out of stratigraphic context. Therefore, they are not considered important for scientific study, and Artificial Fill has no paleontological sensitivity.

Beach Deposits

The Beach Deposits consist of fine-to-coarse grained sand that is well sorted but may locally include talus in some areas. Although Holocene (less than 11,700 years ago) deposits can contain remains of plants and animals, only those from the middle to early Holocene (4,200 to 11,700 years ago) are considered scientifically important (SVP, 2010). Fossils from this time interval are not common; therefore, this unit is considered to have low paleontological sensitivity (Saucedo et al., 2016).

Old Shallow Marine Deposits on Wave Cut Surface

The Old Shallow Marine Deposits on Wave Cut Surface are Middle to Late Pleistocene in age and consist of reddish brown siltstone, sandstone, and conglomerate. These sediments are interfingered strandline beach, estuarine, and colluvial deposits that are poorly sorted. The Old Shallow Marine Deposits rest on now emergent wave cut abrasion platforms (Saucedo et al., 2016).

These deposits span the latest two North American Land Mammal Ages (NALMAs): the Rancholabrean (11,700–240,000 years ago) and the Irvingtonian (240,000 years ago–1.8 Ma) (Sanders et al., 2009; Bell et al., 2004). Fossils are known in similar Rancholabrean and Irvingtonian deposits from excavations for roads, housing developments, and quarries, as well as scientific investigations in the Southern California area (Jefferson, 1991a, 1991b; Miller, 1971; Pajak et al., 1996; Reynolds and Reynolds, 1991; Springer et al., 2009). These fossils include mammoths, mastodons, horses, bison, camels, saber-toothed cats, coyotes, deer, and sloths, as well as smaller animals like rodents, rabbits, birds, reptiles, and fish. As such, these deposits are considered to have high paleontological sensitivity.

Fossil Locality Search

According to the locality search conducted by the NHMLA, there are no known fossil localities within the boundaries of the project site. However, this search noted nine fossil localities nearby from similar sedimentary deposits that may occur in the project site. The closest localities, LACM VP 7366, 7422–7425 and 7679 from Pleistocene sands of the Huntington Beach Urban Center Sand Borrow Area approximately 1.9 miles southeast of the project site, produced Legless lizard (*Anniella*), tree frog (*Hyla*), gopher snake (*Pituophis*), garter snake (Thamnophis), kingsnake (*Lampropeltis*), ring-necked snake (*Diadophis*), long-nosed snake (*Rhinocheilus*), coachwhip (*Masticophis*), salamander (*Enatina*), slender salamander (*Batrachoseps*), skinks (*Plestiodon*), alligator lizard (*Gerrhonotus*), toad (*Bufo*), side-blotched lizard (*Uta*), spiny lizard (*Sceloporus*), climbing salamander (*Aneides*), turtle (*Clemmys*), quail (*Callipepla*), rail (*Rallus*), vole (*Microtus*), pocket gopher (*Thomomys*), shrew (*Sorex*), kangaroo rat (*Diopdomys*), cottontail rabbit (*Sylvilagus*), mole (*Scapanus*), harvest mouse (*Reithrodontomys*), deer mouse (*Peromyscus*), pack rat (*Neotoma*), chipmunk (*Eutamias*), bat (Chiroptera), Mammoth (*Mammuthus*), horse (*Equus*), bison (*Bison*), stickleback (*Gasterosteus*), houndshark (Triakis), and Land snails (Gastropoda). The next locality, LACM IP 21419 from Huntington Beach adjacent to the Bolsa Chica Ecological Preserve approximately 2.7 miles northwest of the project site, produced uncatalogued invertebrates from Pleistocene sandstone sediments. From Huntington Central Park West approximately 2 miles north of the project site, locality LACM IP 23657 also produced uncatalogued invertebrates from Pleistocene sands. LACM VP 6912 from Pleistocene terrace deposits at Bolsa Chica State Beach approximately 1.9 miles northwest of the project site produced remains of Mammoth (*Mammuthus*), ground sloth

(*Paramylodon*), horse (*Equus*), and bison (*Bison*). The last closest locality that the NHMLA has is LACM VP 1121 from Pleistocene terrace deposits approximately 6 miles northwest of the project site and just south of Seal Beach, which produced remains of Mammoth (*Mammuthus*), sea otter (*Enhydrus*), and horse (*Equus*). A copy of the NHMLA fossil locality search results letter is included in Attachment C.

Field Survey

The pedestrian field survey was completed by LSA archaeologist Ivan Strudwick, who is cross-trained in paleontology. The survey was conducted on two days, November 5 and 13, 2025. No paleontological material was found during the survey.

On November 5, 2025, the southern portion of the project site was surveyed, while the northern portion of the project site including the area north of Seapoint Street was surveyed on November 14, 2025. The survey showed that the entire project site is highly disturbed from years of use as an oil field and the activities associated with this use.

The southern portion of the project site near Goldenwest Street contains several oil wells with working pumpjacks. It also contains two shallow basin areas, 2–4/5 feet deep, used for water retention during rain events. The working wells, water retention, other areas (pipeline areas, and tank areas, etc.), and the entire field itself, are surrounded by concrete-covered earthen containment berms. Most of the roads are either paved or oiled gravel roads. Some areas are concrete covered. The buildings are surrounded by either paved asphalt or concrete areas. The northern third of the project site consists of open gravel lots used for material storage. The project site north of Seapoint Street consists of a gravel area to the west with pipelines and an ice plant-covered flood-control basin to the east, adjacent to private residences.

The survey found only small areas with exposed sediment. These areas included the water retention basins near Goldenwest Street, the fenced edge of the entire project area, and the water retention basin on the east side of the project area north of Seapoint Street. Exposed sediment was a yellow-brown silt clay with quantities of gravel road base. Road gravel is ubiquitous in the project area and indicates that the entire surface is highly disturbed. Visible native sediments were consistent with geologic mapping by Saucedo et al. (2016).

Impact Analysis

The project area contains Artificial Fill, which has no paleontological sensitivity; Beach Deposits, which have low paleontological sensitivity and Old Shallow Marine Deposits on Wave Cut Surfaces, which have high paleontological sensitivity. Based on the conceptual project plans, there is a potential for the project to impact scientifically significant paleontological resources.

Mitigation

To ensure that potential impacts to undiscovered paleontological resources remain less than significant, preparation of a Paleontological Resources Impact Mitigation Program (PRIMP), paleontological monitoring of construction activities, appropriate treatment of newly discovered

resources, and preparation of a final paleontological monitoring report would be required, as outlined in the following Mitigation Measure (MM) PALEO-1.

MM PALEO-1 **Paleontological Resources.** Prior to the commencement of ground-disturbing activities, a qualified, professional paleontologist who meets the standards set by the Society of Vertebrate Paleontology (SVP) shall be retained to develop a Paleontological Resources Impact Mitigation Program (PRIMP) for this project. The PRIMP shall be consistent with the guidelines of the SVP and shall include the methods that will be used to protect paleontological resources that may exist within the project limits, as well as procedures for monitoring, fossil preparation and identification, curation into a repository, and preparation of a report at the conclusion of ground disturbance.

If ground-disturbing activities occur in deposits with high paleontological sensitivity (i.e., Old Shallow Marine Deposits on Wave Cut Surface), those activities shall be monitored by a qualified paleontological monitor following the PRIMP. If paleontological resources are encountered during the course of ground disturbance, the paleontological monitor shall have the authority to temporarily redirect construction away from the area of the find in order to assess its significance. Once soils have been monitored during the excavation stage and determined to lack the presence of paleontological resources, monitoring of these soils would no longer be necessary for the remainder of grading activities. In the event that paleontological resources are encountered when a paleontological monitor is not present, work in the immediate area of the find shall be redirected and the paleontologist or paleontological monitor shall be contacted to assess the find for scientific significance. If determined to be scientifically significant, the fossil shall be collected from the field.

Collected resources shall be prepared to the point of identification, identified to the lowest taxonomic level possible, cataloged, and curated into the permanent collections of a museum repository. At the conclusion of the monitoring program, a report of findings shall be prepared to document the results of the monitoring program.

ATTACHMENT A

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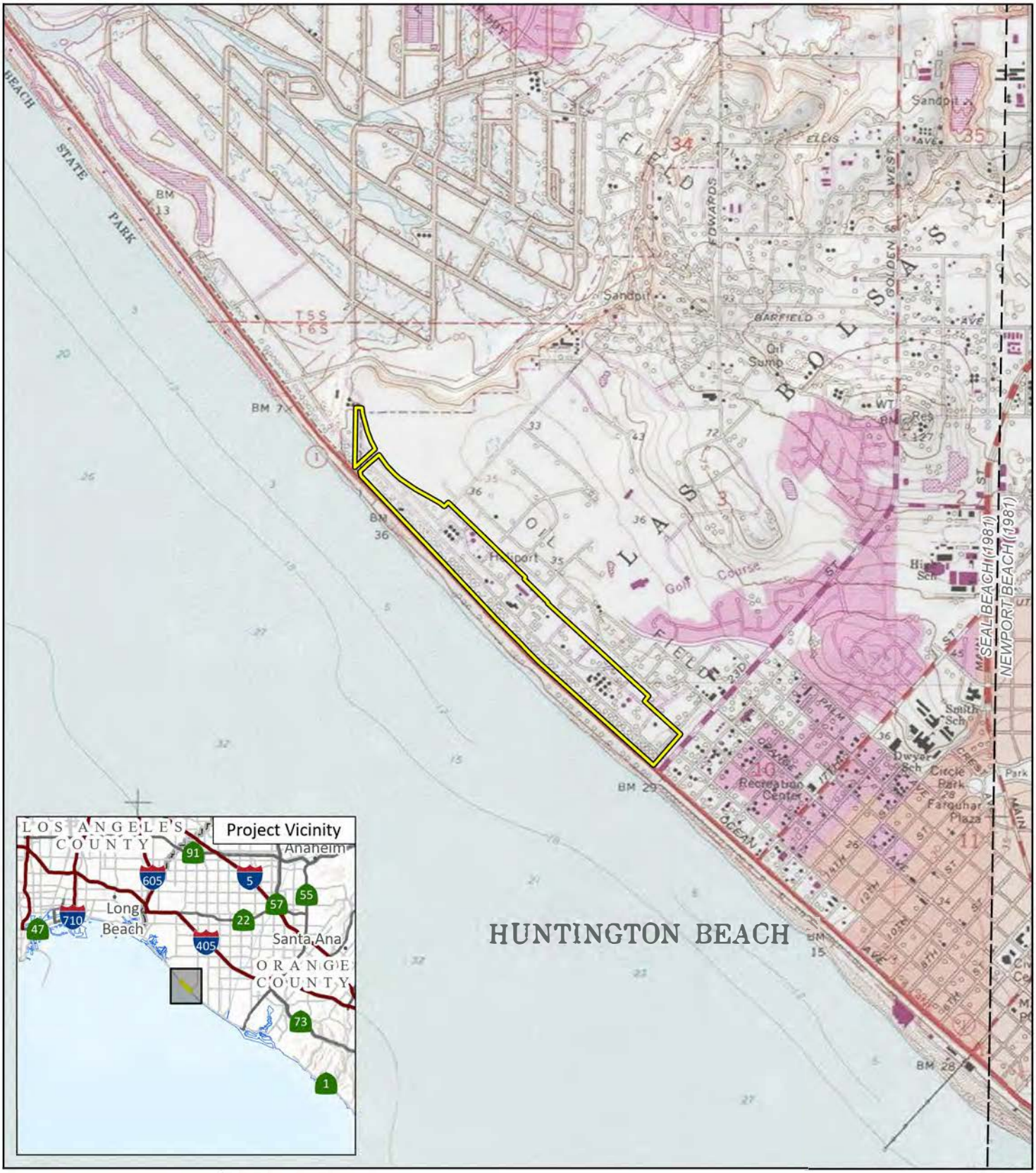
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ATTACHMENT B

FIGURE



LSA

FIGURE 1

SOURCE: USGS 7.5' Quad - *Seal Beach (1981)*, CA

Palm/Goldenwest Specific Plan Redevelopment Project

Project Location and Vicinity

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ATTACHMENT C

FOSSIL LOCALITY SEARCH RESULTS FROM THE NATURAL HISTORY MUSEUM OF LOS ANGELES COUNTY

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

Research & Collections

e-mail: paleorecords@nhm.org

August 16, 2025

LSA
Attn: Kelly Vreeland

re: Paleontological resources records search for the Palm/Goldenwest Specific Plan Redevelopment Project (LSA Proj# HBC2201.05)

Dear Kelly:

I have conducted a search of our paleontology collection records for the proposed Palm/Goldenwest Specific Plan Redevelopment project area as outlined on the portion of the Seal Beach USGS topographic quadrangle map that you sent to me via e-mail on August 9, 2025. We do not have fossil localities that have been recorded or georeferenced directly within the proposed project area, but we do have fossil localities nearby from similar sedimentary deposits that may occur in the proposed project area, either at the surface or at depth.

The following table shows the closest known localities in the collection of the Natural History Museum of Los Angeles County (NHMLA).

Locality Number	Location	Formation	Taxa	Depth
LACM VP 7366, 7422-7425, 7679	The Huntington Beach Urban Center Sand Borrow Area, N of Pacific Coast Hwy and W of Huntington Dr	Unknown formation (Pleistocene, sands)	Legless lizard (*Anniella*), tree frog (*Hyla*), gopher snake (*Pituophis*), garter snake (Thamnophis), kingsnake *(Lampropeltis)*, ring-necked snake *(Diadophis*), garter snake (*Thamnophis*), long-nosed snake (*Rhinocheilus*), coachwhip (*Masticophis*), salamander (*Enatina*), slender salamander (*Batrachoseps*), skinks (*Plestiodon*), alligator lizard (*Gerrhonotus*), toad (*Bufo*), side-blotched lizard *(Uta*), spiny lizard (*Sceloporus*), climbing salamander (*Aneides*), turtle (*Clemmys*); quail (*Callipepla*), rail (*Rallus*); vole (*Microtus*), pocket gopher (*Thomomys*), shrew *(Sorex*),	Unknown

Locality Number	Location	Formation	Taxa	Depth
			kangaroo rat (*Dipodomys*), cottontail rabbit (*Sylvilagus*), mole (*Scapanus*), harvest mouse (*Reithrodontomys*), deer mouse (*Peromyscus*), pack rat (*Neotoma*), chipmunk (*Eutamias*), bat (Chiroptera), Mammoth *(Mammuthus*), horse (*Equus*), bison (*Bison*); stickleback (*Gasterosteus*), houndshark (Triakis); Land snails (Gastropoda)	
LACM IP 21491	Huntington Beach, adjacent to the Bolsa Chica Ecological Preserve	Unknown formation (Pleistocene, med to coarse friable sandstone)	Invertebrates (uncatalogued)	Exposed in sea cliff 3 feet below top
LACM IP 23657	Huntington Central Park West	Unknown formation (Pleistocene; sands)	Invertebrates (uncatalogued)	Surface
LACM VP 6912	Bolsa Chica State Parlk, intertidal zone of beach	Pleistocene terrace deposit	Mammoth (*Mammuthus*), ground sloth (*Paramylodon*), horse (*Equus*), bison (*Bison*)	Unknown
LACM VP 1121	Just south of Seal Beach	Pleistocene terrace deposit	Mammoth (*Mammuthus*), sea otter (*Enhydrus*), horse (*Equus*)	15 feet below sea level

VP, Vertebrate Paleontology; IP, Invertebrate Paleontology; bgs, below ground surface

This records search is limited to the records of the NHMLA. It is not intended as a paleontological assessment of the project for the purposes of California Environmental Quality Act (CEQA) or National Environmental Policy Act (NEPA). Potentially fossil-bearing units are present in the project area, either at the surface or in the subsurface. As such, NHMLA recommends that a paleontological assessment be conducted by a paleontologist meeting Federal (43 Code of Federal Regulations Part 49.110) or Society of Vertebrate Paleontology standards for compliance with applicable regulations, such as CEQA or NEPA.

Sincerely,



Alyssa Bell, Ph.D.
Natural History Museum of Los Angeles County