

MEMORANDUM

DATE: June 27, 2022

To: Thomas J. Leary, Senior Vice President & Chief Legal Officer, MemorialCare Health System

FROM: Jacob Biewer, M.S., Paleontologist, and Sarah Rieboldt, Ph.D., Associate/Principal Paleontologist

SUBJECT: Paleontological Analysis of the San Clemente Senior Housing Project, San Clemente, Orange County, California

INTRODUCTION

This memorandum was prepared to ensure that the San Clemente Senior Housing Project (project) in San Clemente, Orange County, California, is in compliance with all applicable State and local regulations 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 §5097.5; and the City of San Clemente (City) General Plan (City of San Clemente, 2014). The City is the Lead Agency for this project under CEQA.

PROJECT LOCATION AND DESCRIPTION

The 6.63-acre project site is located on the south side of Camino del los Mares, approximately 545 feet (ft) west of the Marbella intersection. The project site is depicted on Figure 1 (Attachment B) on the United States Geological Survey (USGS) *Dana Point, California 7.5-minute topographic quadrangle map* in Township 8 South, Range 7 West, Section 19, San Bernardino Baseline and Meridian (USGS, 1975).

The project would demolish an existing building and construct in its place a 250-dwelling-unit senior housing project with two residential apartment buildings and a 7,500-square-foot, two-story medical office building. Development of the project would involve demolition of the existing building and some site parking lot improvements; new site grading; construction of the new buildings; and installation of new wet and dry utilities, landscaping, and lighting. The deepest excavation associated with the project is expected to be for the dry wells, which will extend to a maximum depth of approximately 30 ft (personal communication, Hunsaker & Associates, May 2022). The excavation depths of the various components of the project are listed in Table A below.

Table A: Anticipated Maximum Excavation Depths for Components of the San Clemente Senior Housing Project

Project Component	Depth ¹
Sewer	6.5–11 ft
Sewer Pump	17 ft
Storm Drain	6–17.5 ft
Dry Wells	30 ft
Water	3.5–6 ft
Overexcavation for Foundations	6 ft
Detention Vaults and MWSs	10 ft

¹ Personal communication, Hunsaker & Associates, May 2022

ft = foot/feet

MWS = Modular Wetland Systems

METHODS

LSA examined geologic maps of the project site and reviewed relevant geological and paleontological literature to determine which geologic units are present in the project site and whether fossils have been recovered in the project site or from similar geologic units elsewhere in the region. Additionally, a fossil locality search was conducted through the Natural History Museum of Los Angeles County (NHMLAC) to determine the status and extent of previously recorded paleontological resources within and surrounding the project site.

RESULTS

Literature Review

The project site is in the Peninsular Ranges Geomorphic Province, a 900-mile-long northwest-southeast trending structural block that extends from the Transverse Ranges in the north to the tip of Baja California in the south (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 Kennedy and Tan (2007) indicates the entire project site is underlain by the Capistrano Formation, which is early Pliocene to late Miocene (3.6–11.63 Ma) in age. Although not mapped by Kennedy and Tan (2007), the geotechnical report prepared for this project noted Artificial Fill in the project site where it was placed for the previous development of the property (Leighton and Associates, Inc., 2022). The geotechnical report also identified Quaternary (Present to 2.58 Ma) non-marine and marine terrace deposits below the Artificial Fill and overlying the Capistrano Formation in the project site (Leighton and Associates, Inc., 2022). However, the geologic map referenced in the geotechnical report, Bedrossian et al. (2012), described the entire project site

as containing fine-grained Tertiary (2.58 to 66 Ma) deposits, which more closely fits the geologic mapping of the siltstone facies of the Capistrano Formation by Kennedy and Tan (2007). Whether the predominantly silt and clay deposits with occasional thin beds of sand, gravel, and unidentified and undated shell material described in the boring logs are ultimately interpreted as weathered siltstone of the Capistrano Formation or previously unidentified marine and terrestrial terrace deposits cannot be determined at this time. Therefore, for the purposes of this report, the geology mapped by Kennedy and Tan (2007) and the presence of Artificial Fill identified by Leighton and Associates, Inc. (2022) will be used. These geologic units and their relative paleontological sensitivities are described in more detail below. The dates for the geologic time intervals are based on the *International Chronostratigraphic Chart* prepared by the International Commission on Stratigraphy (Cohen et al., 2022).

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 is dependent 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. The geotechnical report prepared for this project identified Artificial Fill from the surface to depths ranging from 1.5 ft to 45.5 ft across the project site (Leighton and Associates, Inc., 2022).

While 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. As such, Artificial Fill has no paleontological sensitivity.

Capistrano Formation

The marine Capistrano Formation was deposited during the early Pliocene to late Miocene (3.6–11.63 Ma) (Kennedy and Tan, 2007). In the vicinity of the project site, it has two facies that are distinguished by their depositional environments and corresponding compositions. The turbidite facies formed in marine channel and sub-sea fan environments; it is composed of coarse-grained, poorly bedded, weakly cemented sandstone and conglomeratic sandstone (Kennedy and Tan, 2007). In contrast, the siltstone facies accumulated in deep shelf and slope environments and consists of white to pale gray, massive to poorly bedded, friable siltstone, mudstone, and diatomaceous shale (Kennedy and Tan, 2007). Only the siltstone facies is mapped within the project site.

This formation has produced abundant and diverse scientifically significant fossils, many of which come from the siltstone facies. These fossils include bony fish, sharks, whales, porpoises, sea lions, sea cows, and marine birds (Barnes and Raschke, 1991; Deméré and Berta, 2005; Ebeling, 1962; Eisentraut and Cooper, 2002; Smith, 2011). As such, these deposits are considered to have high paleontological sensitivity.

Fossil Locality Search

The fossil locality search conducted by the NHMLAC indicated that no fossil localities are present within the boundaries of the project site. However, this search noted records of several fossil localities nearby from the Capistrano Formation. The closest fossil locality, LACM IP 26134, near the

intersection of Camino Capistrano and Camino Mira Costa, yielded a number of unspecified invertebrates. The next closest localities, LACM VP 4347 and 1875, and LACM IP 5016, located northeast of Pacific Coast Highway, 0.50 mile northwest of Poche County Beach, produced a number of bony fish (Osteichthyes) and unspecified invertebrates. LACM VP 4012, located on Capistrano Beach, yielded remains of marine mammal (Cetacea) and bony fish (Osteichthyes). The most notable fossil localities near the project are LACM VP 4631, 5498, 5562, and 5563; and LACM IP 7766, 10028-10031, and 17596. These localities come from the “Marblehead” development bounded by Avenida Vista Hermosa, Interstate 5, E Avenida Pico, and Camino Vera Cruz and have produced remains of numerous marine vertebrates including walruses (Odobeninae, *Gomphotaria pugnax*), fur seal (Arctocephalinae), sabertooth salmon (*Oncorhynchus rastrosus*), requiem shark (*Carcharhinus*), white shark (*Carcharodon*), eagle ray (*Myliobatis*), blue shark (*Prionace*), hammerhead shark (*Sphyrna*), and eel (Anguiliformes). A copy of the fossil locality search results from the NHMLAC is included in Attachment C.

CONCLUSIONS AND RECOMMENDATIONS

The project site contains Artificial Fill, which has no paleontological sensitivity, as well as the Capistrano Formation, which has high paleontological sensitivity. With excavation for the various project components extending to depths of 3.5 ft to 30 ft across the project site, development of this project is expected to extend into paleontologically sensitive sediments of the Capistrano Formation and has the potential to impact scientifically significant paleontological resources. Moreover, as noted above, the geotechnical report has potentially identified unmapped geologic units of Quaternary age (Present to 2.58 Ma) in the project site and noted the presence of shell material in those deposits. Any fossils recovered from this project site would be instrumental in determining the stratigraphy and depositional age and environment of these deposits, and are scientifically very important. Therefore, in order to mitigate potential impacts to these resources, LSA recommends the following mitigation measures:

- PALEO-1** A paleontologist who meets the qualifications established 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 standards of the SVP and include the methods that will be used to protect paleontological resources that may exist within the project site, as well as procedures for monitoring, fossil preparation and identification, curation into a repository, and preparation of a report at the conclusion of grading.
- PALEO-2** Excavation and grading activities in deposits with high paleontological sensitivity (i.e., the Capistrano Formation) shall be monitored by a qualified paleontological monitor following a PRIMP. No monitoring is required for excavations in deposits with no paleontological sensitivity (i.e., Artificial Fill). 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 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.

PALEO-3 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.

Implementation of Mitigation Measures PALEO-1 through PALEO-3 will ensure that project impacts on paleontological resources will be reduced to a level that is less than significant.

Attachments: A: References
B: Figure 1: Project Location and Vicinity
C: Fossil Locality Search Results from the Natural History Museum of Los Angeles County

ATTACHMENT A

REFERENCES

Barnes, Lawrence G., and Rodney E. Raschke

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City of San Clemente

- 2014 *City of San Clemente Centennial General Plan, Natural Resources Element*. Adopted February 4, 2014. Website: <http://www.san-clemente.org/departments-services/planning-services/general-plan>.

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Leighton and Associates, Inc.

2022 Geologic and Seismic Hazards Review, Proposed San Clemente Senior Housing Project, 654 Camino de los Mares, City of San Clemente, Orange County, California. Prepared for Memorial Care Health System, May 19, 2022. Leighton and Associates, Inc., Project No. 13468.002.

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2011 Taxonomic Revision and Phylogenetic Analysis of the Flightless Mancallinae (Aves, Pan-Alcidae). ZooKeys 91:1–116.

Society of Vertebrate Paleontology (SVP)

2010 Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources. SVP. Impact Mitigation Guidelines Revision Committee. 11 pp.

United States Geological Survey (USGS)

1975 Dana Point, California 7.5-minute topographic quadrangle. Published 1968, photorevised 1975. United States Geological Survey, Denver, Colorado.

ATTACHMENT B

FIGURE

Figure 1: Project Location and Vicinity Map

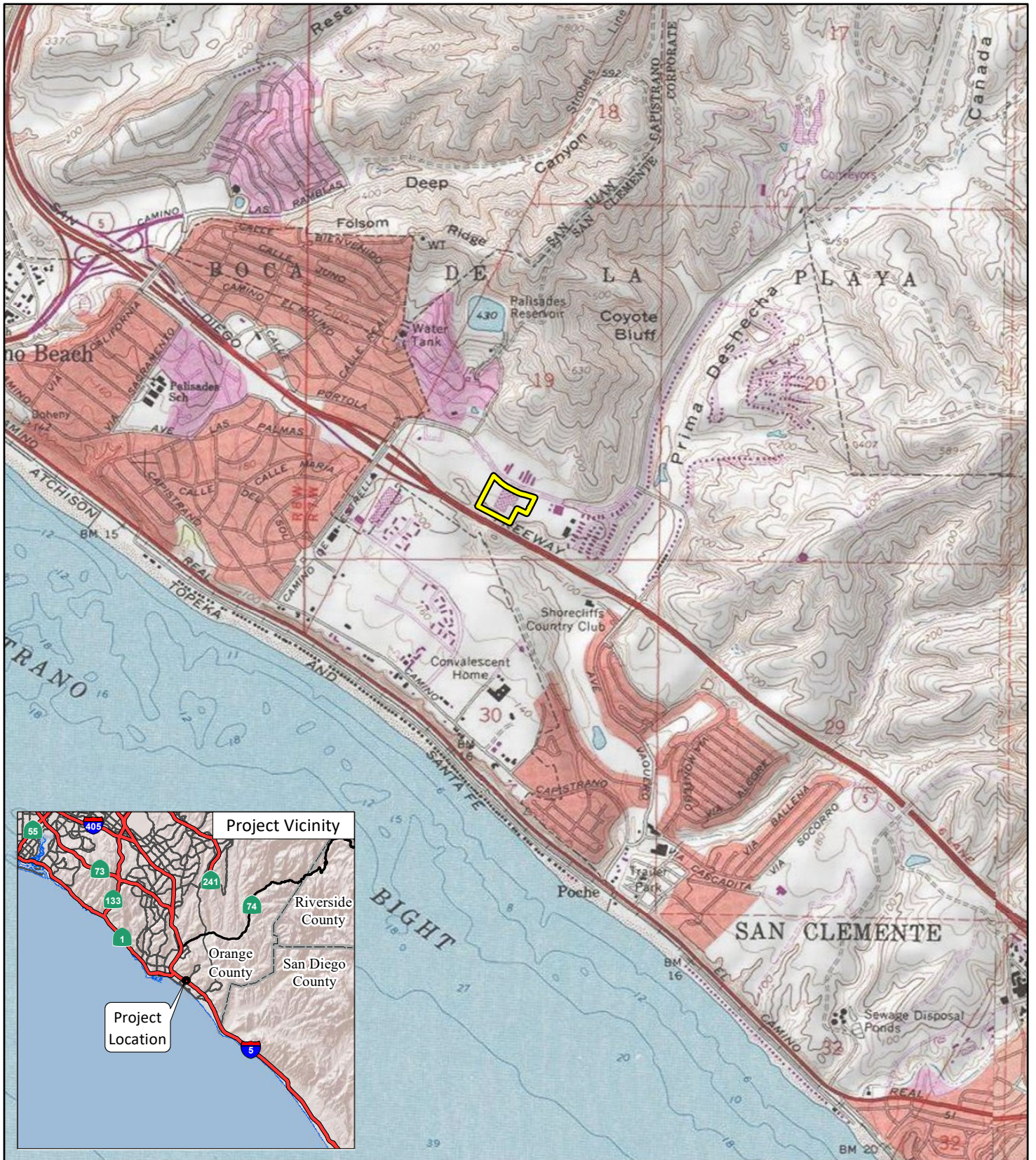


FIGURE 1

LSA

LEGEND

 Project Location



0 1000 2000
FEET

SOURCE: USGS 7.5' Quad - Dana Point (1975), CA

I:\MEA2202\GIS\MXD\ProjectLocation.mxd (4/5/2022)

San Clemente Senior Housing Project
Project Location and Vicinity

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

April 2, 2022

LSA Associates, Inc.
Attn: Jacob Biewer

re: Paleontological resources for the San Clemente Senior Housing Project (MEA2202)

Dear Jacob:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for proposed development at the San Clemente Senior Housing project area as outlined on the portion of the Dana Point USGS topographic quadrangle map that you sent to me via e-mail on March 28, 2022. We do not have any fossil localities that lie directly within the proposed project area, but we do have fossil localities nearby from the same sedimentary deposits that 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 IP 26134	East side of [old] Pacific Coast Highway; near intersection of Camino Capistrano and Camino Mira Costa	Capistrano Formation	Invertebrates (unspecified)	Surface
LACM VP 4347, 1875; LACM IP 5016	NE side of Pacific Coast Hwy approximately 1/4 to 1/2 mile NW of Poche County Beach	Capistrano Formation (fine grained silty diatomite)	Bony fish (Osteichthyes); Invertebrates (unspecified)	Surface at base of cliff
LACM VP 4012	Capistrano Beach	Capistrano Formation	Marine mammal (Cetacea), Bony fish (Osteichthyes)	Unknown
LACM VP 5507; LACM IP 35, 138, 4741	Quaternary Terrace deposits	White croaker (Genyonemus); elephant clade (Proboscidea); Invertebrates (unspecified)	Unknown	Quaternary Terrace deposits

			Walruses (<i>Odobeninae</i> , <i>Gomphotaria pugnax</i>), (<i>Cetacea</i>), fur seal (<i>Arctocephalinae</i>), Sabertooth salmon (<i>Oncorhynchus</i> <i>rastrusus</i>), requiem shark (<i>Carcharhinus</i>), mackerel sharks (<i>Isurus</i>), sixgill sharks (<i>Hexanchus</i>), bony fish (<i>Eclipses</i>), white sharks (<i>Carcharodon</i>), eagle ray (<i>Myliobatis</i>), pile perch (<i>Damalichthys</i>), perch-like fish (<i>Thyrsoles</i>), wrasse (<i>Semicossyphus</i>), blue shark (<i>Prionace</i>), hammerhead shark (<i>Sphyrna</i>), wolf eel (<i>Anarrhichthys</i>), eel (<i>Anguilliformes</i>), short-nosed chimaeras (<i>Chimeridae</i>); unspecified invertebrates	
LACM VP 4631, 5498, 5562, 5563; LACM IP 7766, 10028-10031, 17596	“Marblehead”; development bounded by Avenida Vista Hermosa, I-5, E Avenida Pico, and Camino Vera Cruz; San Clemente	Capistrano Formation (massive firm gray siltstone with some gypsum & sulfur underlain by sandstone; majority of specimens in bonebed deposit)		Unknown, collected during grading

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

This records search covers only the records of the NHMLA. It is not intended as a paleontological assessment of the project area for the purposes of CEQA or 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 full paleontological assessment of the project area be conducted by a paleontologist meeting Bureau of Land Management or Society of Vertebrate Paleontology standards.

Sincerely,



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

enclosure: invoice