

# PALEONTOLOGICAL ASSESSMENT FOR THE 945-1065 CARLSBAD VILLAGE DRIVE PROJECT

CARLSBAD, SAN DIEGO COUNTY, CALIFORNIA

APNs 203-320-53, -54, -55, and -56

**City:**

City of Carlsbad  
Planning Department  
1635 Faraday Avenue  
Carlsbad, California 92008

**Preparer:**

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**Project Proponent:**

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*February 23, 2023; Revised May 23, 2023*



**BFSA Environmental Services**  
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## **Paleontological Database Information**

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**Report Date:** February 27, 2023; Revised May 23, 2023

**Report Title:** Paleontological Assessment for the 945-1065 Carlsbad Village  
Drive Project, Carlsbad, San Diego County, California

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**Submitted to:** City of Carlsbad  
Planning Department  
1635 Faraday Avenue  
Carlsbad, California 92008

**USGS Quadrangle:** Section 6, Township 12 South, Range 4 West, *San Luis Rey,*  
*California* (7.5-minute)

**Assessor's Parcel Numbers:** 203-320-53, -54, -55, and -56

**Key Words:** Paleontological assessment; Pleistocene old paralic deposits;  
high paleontological resource sensitivity; monitoring  
recommended.

## **Table of Contents**

<b><u>Section</u></b>	<b><u>Page</u></b>
1.0 INTRODUCTION AND LOCATION .....	1
2.0 REGULATORY SETTING.....	1
3.0 GEOLOGY .....	4
4.0 PALEONTOLOGICAL RESOURCES.....	4
4.1 Definition .....	4
4.2 Fossil Locality Records Search.....	6
5.0 PALEONTOLOGICAL SENSITIVITY .....	6
5.1 Overview.....	6
5.2 Professional Standards.....	7
5.3 City Assessment of Paleontological Sensitivity .....	7
6.0 CONCLUSION AND RECOMMENDATIONS .....	7
7.0 CERTIFICATION .....	8
8.0 REFERENCES .....	8

## **Appendices**

Appendix A – Qualifications of Key Personnel

## **List of Figures**

<b><u>Figure</u></b>	<b><u>Page</u></b>
Figure 1      General Location Map .....	2
Figure 2      Project Location Map.....	3
Figure 3      Geologic Map.....	5

## **1.0 INTRODUCTION AND LOCATION**

A paleontological resource assessment has been completed for the 945-1065 Carlsbad Village Drive Project, located just west of Interstate 5, in the northwestern area of the city of Carlsbad, San Diego County, California (Figures 1 and 2). The project consists of four parcels (Assessor's Parcel Numbers [APNs] 203-320-53, -54, -55, and -56) and is situated within the Section 6 area of Township 12 South, Range 4 West on the U.S. Geological Survey (USGS) *San Luis Rey, California* topographic quadrangle (7.5-minute) map (see Figure 2). The project applicant is proposing to improve the parcels as a mixed-use development. Currently, the project parcels are completely developed as a shopping strip mall called Carlsbad Village Plaza.

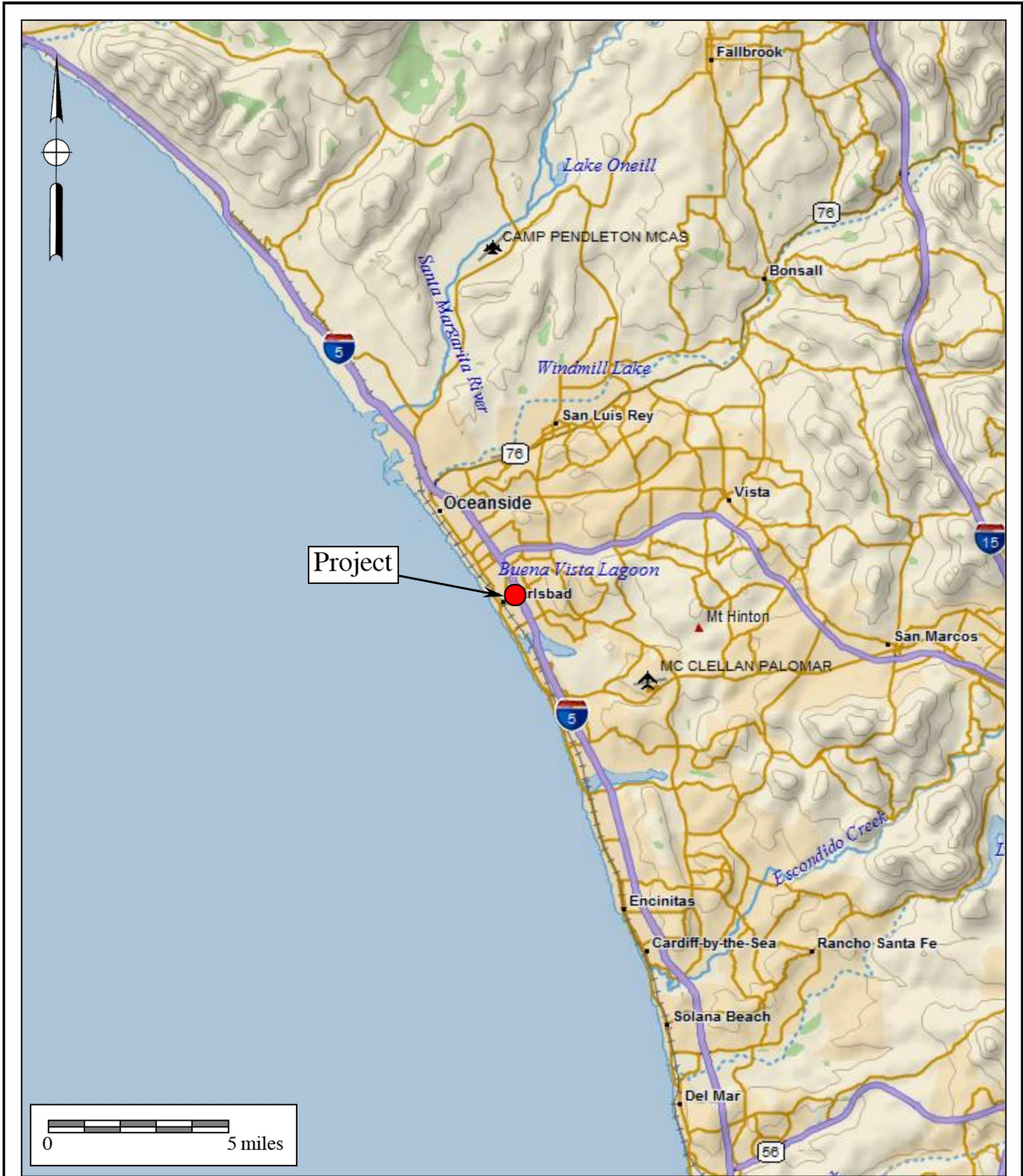
The City of Carlsbad has required the preparation of a paleontological assessment to evaluate the project's potential to yield paleontological resources. The paleontological assessment of the project included a review of paleontological literature and fossil locality records in the area, a review of the underlying geology, and recommendations to monitor for impacts to potential paleontological resources, if necessary.

## **2.0 REGULATORY SETTING**

The California Environmental Quality Act (CEQA), which is patterned after the National Environmental Policy Act, is the overriding environmental regulation that sets the requirements for protecting California's paleontological resources. CEQA mandates that governing permitting agencies (lead agencies) set their own guidelines for the protection of nonrenewable paleontological resources under their jurisdiction.

Under "Guidelines for Implementation of the California Environmental Quality Act," as amended in December 2018 (California Code of Regulations [CCR] Title 14, Division 6, Chapter 3, Sections 15000 et seq.), procedures define the types of activities, persons, and public agencies required to comply with CEQA. Section 15063 of the CCR provides a process by which a lead agency may review a project's potential impact to the environment, whether the impacts are significant, and provide recommendations, if necessary.

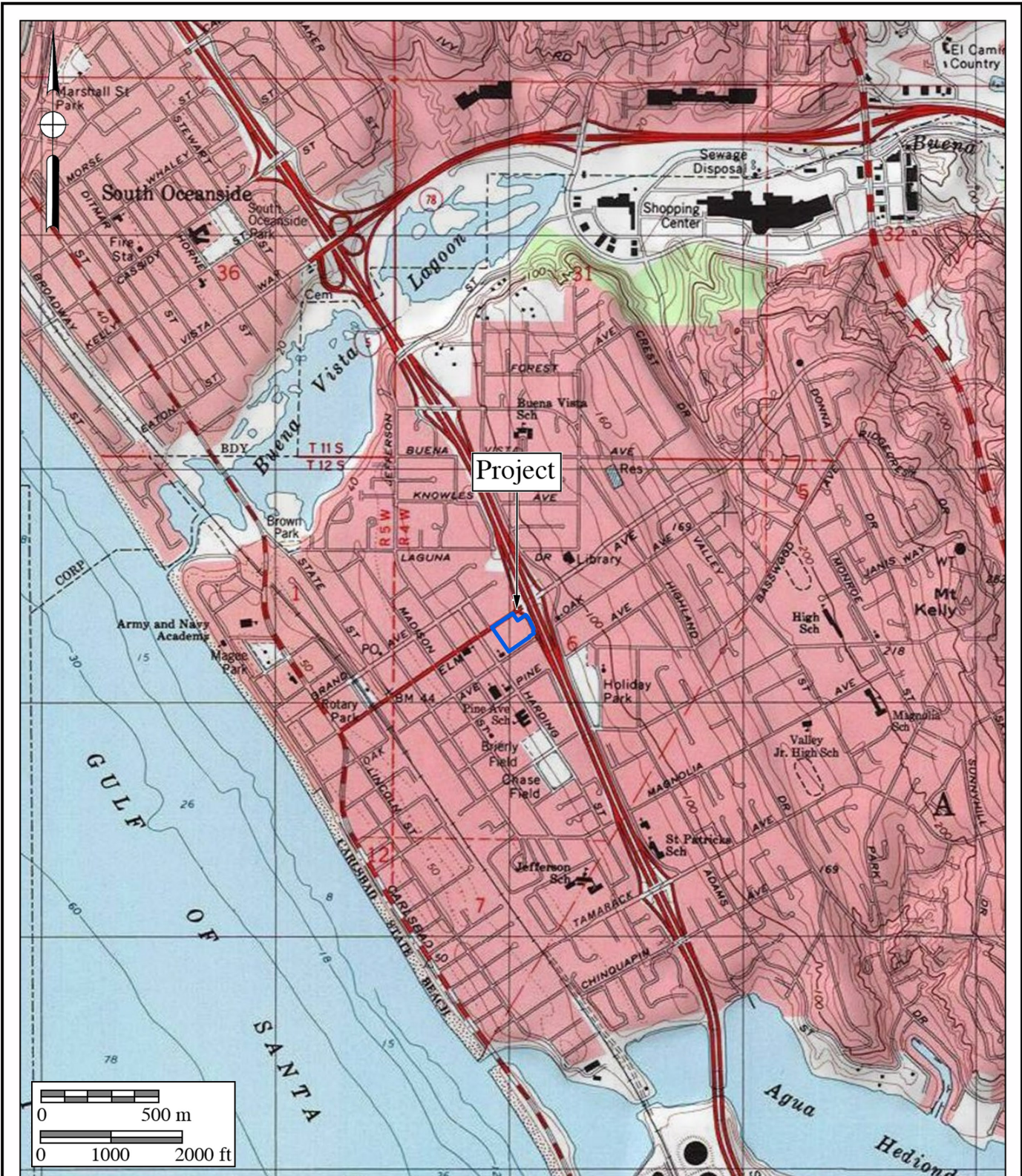
In CEQA's Environmental Checklist Form, one of the questions to answer is, "Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?" (Appendix G, Section VII, Part f). This is to ensure compliance with California Public Resources Code Section 5097.5, the law that protects nonrenewable resources including fossils, which is paraphrased below:



**Figure 1**  
**General Location Map**

The 945-1065 Carlsbad Village Drive Project  
 DeLorme (1:250,000 series)





**Figure 2**  
**Project Location Map**

The 945-1065 Carlsbad Village Drive Project  
 USGS *San Luis Rey* Quadrangle (7.5-minute series)



- a) A person shall not knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, rock art, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands.
- b) As used in this section, “public lands” means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.
- c) A violation of this section is a misdemeanor.

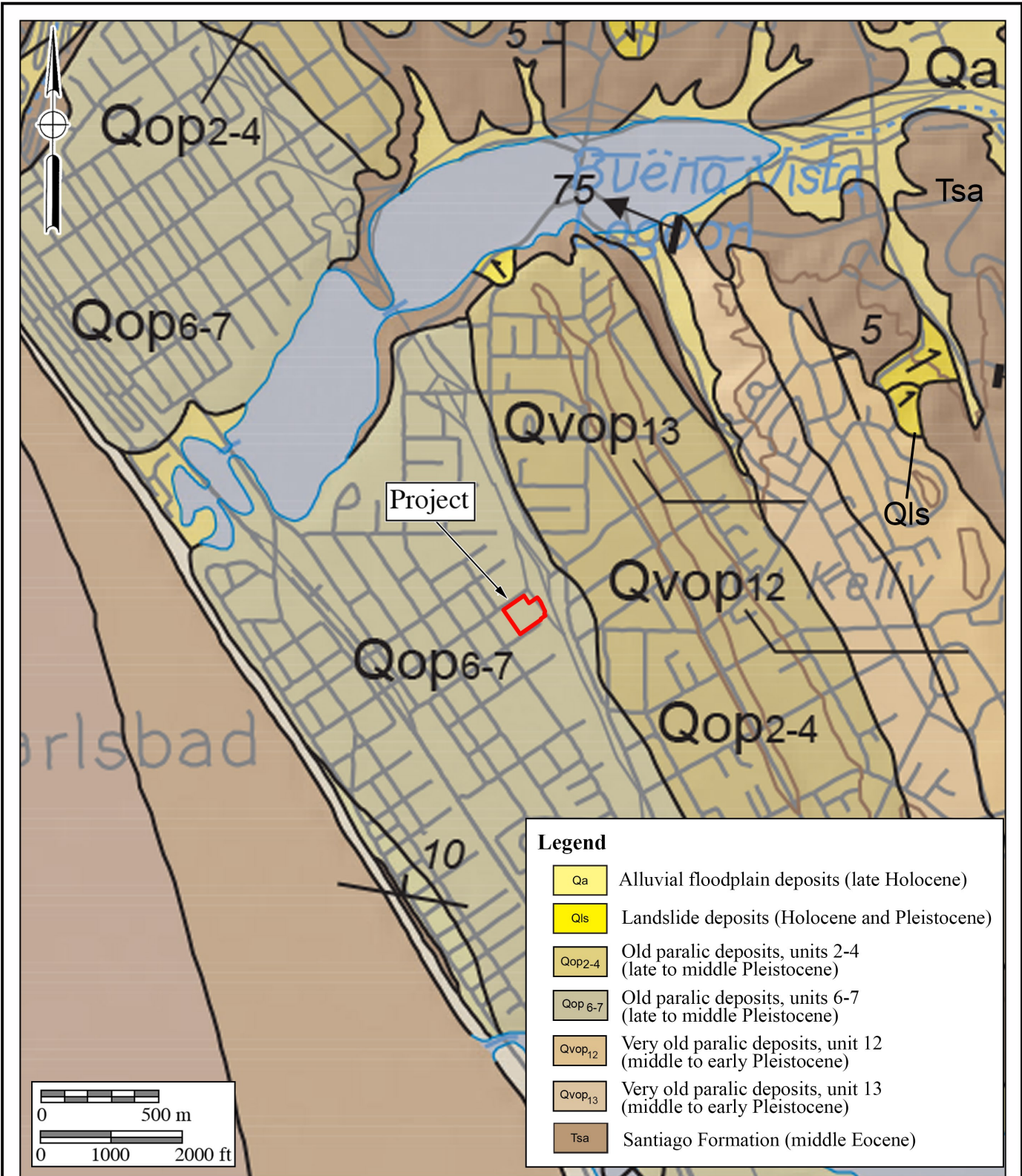
### **3.0 GEOLOGY**

Geomorphically, the project property occupies an elevated terrace at an elevation of approximately 60 feet (approximately 18 meters) above mean sea level. Geologically, as shown on Figure 3 after Kennedy and Tan (2007), multiple marine terraces in the project area’s terrace complex have truncated the older, underlying Eocene-aged Santiago Formation (brown areas labeled as “Tsa” on Figure 3), and refer to the terrace sediments, including their overlying alluvial and colluvial deposits, as Pleistocene “old paralic deposits” (symbolized as “Qop2-4” and “Qop6-7”). As shown on Figure 3, the project is mapped as underlain by younger old paralic deposits (Qop6-7), where Kennedy and Tan (2007) grouped deposits of the “Bird Rock terrace” with deposits of the older (higher and slightly farther inland) “Nestor terrace” (~120,000 years old).

### **4.0 PALEONTOLOGICAL RESOURCES**

#### **4.1 Definition**

Paleontological resources are the remains of prehistoric life that have been preserved in geologic strata. These remains are called fossils and include bones, shells, teeth, and plant remains (including their impressions, casts, and molds) in the sedimentary matrix, as well as trace fossils such as footprints and burrows. Fossils are considered older than 5,000 years of age (Society of Vertebrate Paleontology 2010) but may include younger remains (subfossils), for example, when viewed in the context of local extinction of the organism or habitat. Fossils are considered a nonrenewable resource under state and local guidelines (see Sections 2.0 and 5.0 of this report).



**Figure 3**  
**Geologic Map**

The 945-1065 Carlsbad Village Drive Project  
Geology after Kennedy and Tan (2007)



## 4.2 Fossil Locality Records Search

A literature search and an examination of museum and university fossil collections and/or locality records of the San Diego Society of Natural History (SDSNH) revealed a number of nearby fossil localities assigned to upper Pleistocene terrace and estuarine deposits, all located north of the project along the northern edge of Buena Vista Lagoon. The closest is SDSNH Locality 4007, located about one mile to the northeast, and yielded a partial mammoth tusk. Several additional SDSNH localities, rich with late Pleistocene marine invertebrate fossils, were recovered at the Pacific Coast Plaza project that borders State Route 78 in Oceanside (SDSNH locs. 4024 through 4033). These localities represent a diverse assemblage of mollusks, shark teeth, and unidentified mammal remains (Deméré and Riney 2000), and represent marine high-stand conditions of approximately 300,000 to 400,000 years ago (Kennedy and Browne 2007). The closest known published locality of late Pleistocene invertebrate fossils was reported by Peska (1976), who reported eight species of bivalves and one gastropod species approximately 1.5 miles northeast of the project, near where El Camino Real crosses Buena Vista Creek. A fossil whale rib was discovered about 25 feet deep at the Oceanside Beachfront Resort project, approximately three miles up the coast (Wirths 2020). The nearest known fossil locality from the often-fossiliferous Santiago Formation is at Robertson Ranch West, about two miles east/southeast of the project, yielding a shallow marine molluscan fauna (Kennedy et al. 2017).

## 5.0 PALEONTOLOGICAL SENSITIVITY

### 5.1 Overview

The degree of paleontological sensitivity of any particular area is based on a number of factors, including the documented presence of fossiliferous resources on a site or in nearby areas, the presence of documented fossils within a particular geologic formation or lithostratigraphic unit, and whether or not the original depositional environment of the sediments is one which might have been conducive to the accumulation of organic remains that may have become fossilized over time. Holocene alluvium is generally considered to be geologically too young to contain significant nonrenewable paleontological resources (*i.e.*, fossils) and thus is typically assigned a low paleontological sensitivity. Pleistocene (more than 11,700 years old) alluvial and paralic deposits are known to yield significant molluscan faunas and important terrestrial vertebrate fossils, such as extinct mammoths, mastodons, and giant ground sloths; extinct species of horse, bison, and camel; saber-toothed cats, and others (*e.g.*, Deméré and Riney 2000). These Pleistocene sediments are thus accorded a high paleontological resource sensitivity. The Santiago Formation, consisting of marine and non-marine sedimentary rocks, is fossiliferous, and is known to yield a diverse fauna of vertebrate fossils such as long-extinct terrestrial reptiles and mammals, and marine invertebrate fossils such as bivalve and gastropod mollusks, and also has a high paleontological sensitivity (Deméré and Walsh 1993; Stephenson et al. 2009).

## 5.2 Professional Standards

The Society of Vertebrate Paleontology (2010) has drafted guidelines that include four categories of paleontological sensitivity for geologic units (formations) that might be impacted by a proposed project, as listed below:

- *High Potential:* Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered.
- *Undetermined Potential:* Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment, and that further study is needed to determine the potential of the rock unit.
- *Low Potential:* Rock units that are poorly represented by fossil specimens in institutional collections or based on a general scientific consensus that only preserve fossils in rare circumstances.
- *No Potential:* Rock units that have no potential to contain significant paleontological resources, such as high-grade metamorphic rocks and plutonic igneous rocks.

Using these criteria, based on the geologic formations at and near the project, both the Pleistocene old paralic deposits and the Eocene Santiago Formation can be considered to have a high potential to yield significant paleontological resources.

## 5.3 City Assessment of Paleontological Sensitivity

The City of Carlsbad has assigned sensitivity ratings of paleontological potential to geologic formations within the city limits (City of Carlsbad 2017). The geologic units mapped within the project, the Santiago Formation and Pleistocene old paralic deposits, are assigned a high paleontological sensitivity. Geologic units assigned a high sensitivity are said by the City of Carlsbad (2017) to "...have the highest potential to produce unique invertebrate fossil assemblages or unique vertebrate fossil remains."

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

Because of the potential to encounter buried significant paleontological resources, the preparation of a paleontological monitoring plan (PMP) is recommended if earth disturbance activities are planned, in accordance with Section 10.4.2 of the City's paleontological resource guidelines (City of Carlsbad 2017:105). The PMP should be submitted and approved by the City of Carlsbad as a standard condition of approval pursuant to the guidelines prior to the approval of grading permits by the City of Carlsbad's Planning Department. In a PMP, the City specifies the following information, "as applicable and appropriate":

- The level of monitoring (spot checks, part-time, or full-time), protocols and authorization for work stoppages, and safety procedures;

- The need for contractor awareness training for all earthmoving personnel for any projects where a monitor will not be present full time;
- A research design listing the research questions and the data requirements for those questions;
- The level and type of assistance from the contractor needed by the paleontologist to take bulk samples and place them into a safe area for processing;
- The methods for fossil collection, fossil preparation, fossil identification, conducting stratigraphic profiles, and curation;
- The types of progress reports that will be provided to the project proponent and the City (weekly or monthly);
- The schedule for reporting;
- A recommendation for updating the paleontology sensitivity model, which takes into consideration the presence or absence of paleontological resources, the amount of ground disturbance, and the potential for future discoveries;
- The identity of the financially responsible party.

## **7.0 CERTIFICATION**

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this paleontological report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief, and have been compiled in accordance with CEQA criteria.



May 23, 2023

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Todd A. Wirths  
Senior Paleontologist  
California Professional Geologist No. 7588

Date

## **8.0 REFERENCES**

City of Carlsbad. 2017. Carlsbad Tribal, Cultural, and Paleontological Resources Guidelines. Prepared for the City of Carlsbad, California, by ECORP Consulting, Inc.

Deméré, T.A., and Walsh, S.L. 1993. Paleontological resources – County of San Diego. Unpublished report prepared for the San Diego County Department of Public Works, San Diego, by the Department of Paleontology, San Diego Natural History Museum. Pp. i-iii + 1-68, figs. 1-3, 8 maps.

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**APPENDIX A**

**Qualifications of Key Personnel**

# Todd A. Wirths, MS, PG No. 7588

## Senior Paleontologist

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## Education

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**Master of Science, Geological Sciences, San Diego State University, California** 1995

**Bachelor of Arts, Earth Sciences, University of California, Santa Cruz** 1992

## Professional Certifications

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California Professional Geologist #7588, 2003  
Riverside County Approved Paleontologist  
San Diego County Qualified Paleontologist  
Orange County Certified Paleontologist  
OSHA HAZWOPER 40-hour trained; current 8-hour annual refresher

## Professional Memberships

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Board member, San Diego Geological Society  
San Diego Association of Geologists; past President (2012) and Vice President (2011)  
South Coast Geological Society  
Southern California Paleontological Society

## Experience

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Mr. Wirths has more than a dozen years of professional experience as a senior-level paleontologist throughout southern California. He is also a certified California Professional Geologist. At BFSA, Mr. Wirths conducts on-site paleontological monitoring, trains and supervises junior staff, and performs all research and reporting duties for locations throughout Los Angeles, Ventura, San Bernardino, Riverside, Orange, San Diego, and Imperial Counties. Mr. Wirths was formerly a senior project manager conducting environmental investigations and remediation projects for petroleum hydrocarbon-impacted sites across southern California.

## Selected Recent Reports

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- 2019 *Paleontological Assessment for the 10575 Foothill Boulevard Project, City of Rancho Cucamonga, San Bernardino County, California.* Prepared for T&B Planning, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.
- 2019 *Paleontological Assessment for the MorningStar Marguerite Project, Mission Viejo, Orange County, California.* Prepared for T&B Planning. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

- 2019 *Paleontological Monitoring Report for the Nimitz Crossing Project, City of San Diego.* Prepared for Voltaire 24, LP. Report on file at Brian F. Smith and Associates, Inc., Poway, California.
- 2019 *Paleontological Resource Impact Mitigation Program (PRIMP) for the Jack Rabbit Trail Logistics Center Project, City of Beaumont, Riverside County, California.* Prepared for JRT BP 1, LLC. Report on file at Brian F. Smith and Associates, Inc., Poway, California.
- 2020 *Paleontological Monitoring Report for the Oceanside Beachfront Resort Project, Oceanside, San California.* Prepared for S.D. Malkin Properties. Report on file at Brian F. Smith and Associates, Inc., Poway, California.
- 2020 *Paleontological Resource Impact Mitigation Program for the Nakase Project, Lake Forest, Orange County, San California.* Prepared for Glenn Lukos Associates, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.
- 2020 *Paleontological Resource Impact Mitigation Program for the Sunset Crossroads Project, Banning, Riverside County.* Prepared for NP Banning Industrial, LLC. Report on file at Brian F. Smith and Associates, Inc., Poway, California.
- 2020 *Paleontological Assessment for the Ortega Plaza Project, Lake Elsinore, Riverside County.* Prepared for Empire Design Group. Report on file at Brian F. Smith and Associates, Inc., Poway, California.
- 2020 *Paleontological Resource Record Search Update for the Green River Ranch III Project, Green River Ranch Specific Plan SP00-001, City of Corona, California.* Prepared for Western Realco. Report on file at Brian F. Smith and Associates, Inc., Poway, California.
- 2020 *Paleontological Assessment for the Cypress/Slover Industrial Center Project, City of Fontana, San Bernardino County, California.* Prepared for T&B Planning, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.
- 2020 *Paleontological Monitoring Report for the Imperial Landfill Expansion Project (Phase VI, Segment C-2), Imperial County, California.* Prepared for Republic Services, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.
- 2021 *Paleontological Assessment for the Manitou Court Logistics Center Project, City of Jurupa Valley, Riverside County, California.* Prepared for Link Industrial. Report on file at Brian F. Smith and Associates, Inc., Poway, California.
- 2021 *Paleontological Resource Impact Mitigation Program for the Del Oro (Tract 36852) Project, Menifee, Riverside County.* Prepared for D.R. Horton. Report on file at Brian F. Smith and Associates, Inc., Poway, California.
- 2021 *Paleontological Assessment for the Alessandro Corporate Center Project (Planning Case PR-2020-000519), City of Riverside, Riverside County, California.* Prepared for OZI Alessandro, LLC. Report on file at Brian F. Smith and Associates, Inc., Poway, California.
- 2021 *Paleontological Monitoring Report for the Boardwalk Project, La Jolla, City of San Diego.* Prepared for Project Management Advisors, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.