PALEONTOLOGICAL ASSESSMENT FOR THE COLLINS LOGISTICS CENTER PROJECT

CITY OF ORANGE
ORANGE COUNTY, CALIFORNIA

APNs 386-581-18 and 386-561-02

Prepared on Behalf of:

EPD Solutions, Inc.
2355 Main Street, Suite 100
Irvine, California 92614

Prepared for:

City of Orange
300 East Chapman Avenue
Orange, California 92866

Prepared by:

BFSA Environmental Services,
a Perennial Company
14010 Poway Road, Suite A
Poway, California 92064

May 12, 2023

BFSA Environmental Services
A Perennial Company

Paleontological Database Information

Author:	Todd A. Wirths, M.S., Senior Paleontologist, California Professional Geologist No. 7588
Consulting Firm:	BFSA Environmental Services, a Perennial Company 14010 Poway Road, Suite A Poway, California 92064
Report Date:	May 12, 2023
Report Title:	Paleontological Assessment for the Collins Logistics Center Project, City of Orange, Orange County, California
Prepared on Behalf of:	EPD Solutions, Inc. 2355 Main Street, Suite 100 Irvine, California 92614
Prepared for:	City of Orange 300 East Chapman Avenue Orange, California 92602
Assessor's Parcel Numbers:	386-581-18 and 386-561-02
USGS Quadrangle:	Unsectioned Township 4 South, Range 9 West, USGS *Orange, California* Quadrangle (7.5-minute).
Study Area:	6 acres
Key Words:	City of Orange; Paleontological assessment; Pleistocene old alluvial fan deposits; high sensitivity; monitoring recommended.

Table of Contents

Section **Page**

I. INTRODUCTION AND LOCATION....1
II. REGULATORY SETTING....1
State of California....1
County of Orange....4
City of Orange....5
III. GEOLOGY....5
IV. PALEONTOLOGICAL RESOURCES....5
Definition....5
Fossil Locality Search....7
V. PALEONTOLOGICAL SENSITIVITY....7
Overview....7
Professional Standards....7
VI. CONCLUSIONS AND RECOMMENDATIONS....8
VII. CERTIFICATION....10
VIII. REFERENCES....11

Appendices

Appendix A – Qualifications of Key Personnel

List of Figures

Figure **Page**

Figure 1 General Location Map....2
Figure 2 Project Location Map....3
Figure 3 Geologic Map....6

I. INTRODUCTION AND LOCATION

A paleontological resource assessment has been completed by BFSA Environmental Services, a Perennial Company (BFSA), for the Collins Logistics Center Project, located at 500 West Collins Street between Batavia Street and the railroad tracks of the Orange County Transportation Authority, in the city of Orange, Orange County, California (Figures 1 and 2). The six-acre project consists of two parcels, assigned with Assessor's Parcel Numbers (APNs) 386-581-18 and 386-561-02. The project is situated in an unsectioned area of Township 4 South, Range 9 West, of the San Bernardino Baseline and Meridian, as shown on the United States Geological Survey (7.5-minute) 1:24,000-scale *Orange*, *California* topographic quadrangle map (Figure 2). The project proposes to demolish the property's existing structures and construct a logistics center that would include a warehouse, office building, utility infrastructure, and landscaping.

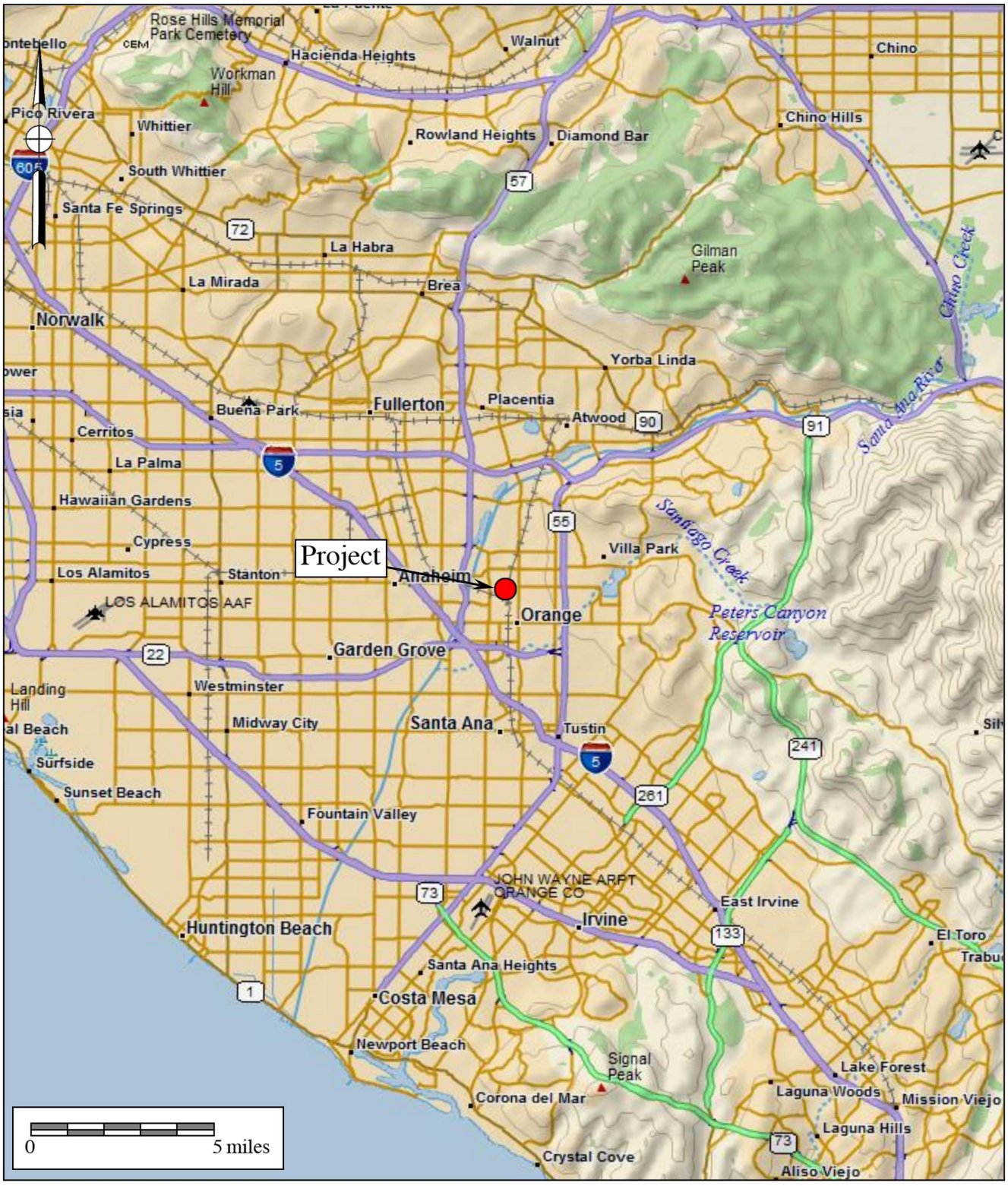
As the lead agency, the City of Orange has required the preparation of a paleontological assessment to evaluate the project's potential to yield paleontological resources. The paleontological assessment of the project included a review of paleontological literature and fossil locality records in the area; a review of the underlying geology; and recommendations to mitigate impacts to potential paleontological resources, if necessary. A paleontological field survey was not conducted since the surface of the project property is completely developed.

II. 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 requirement 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.

State of California

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.



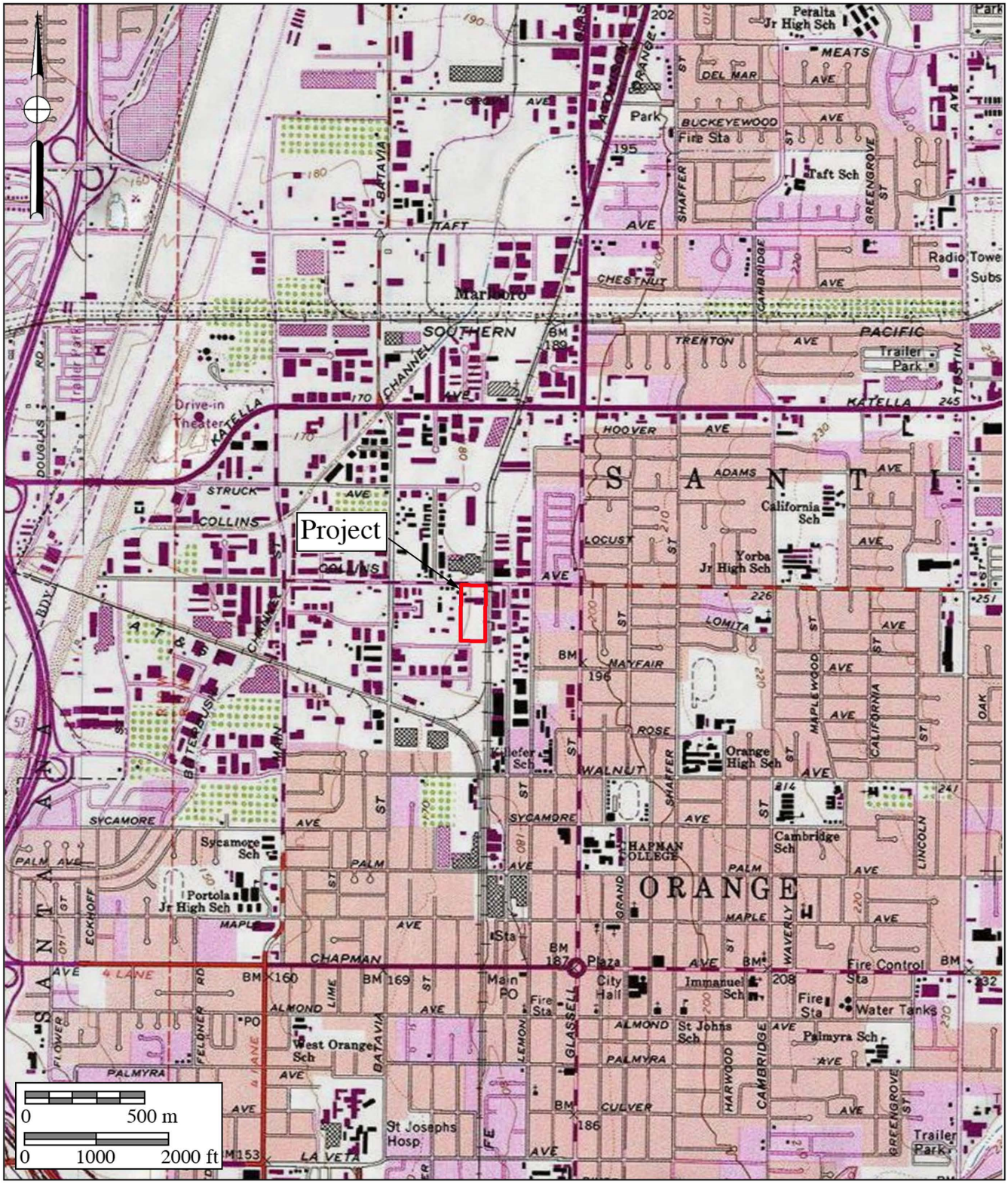
BFSA Environmental Services
A Perennial Company

Figure 1

General Location Map

The Collins Logistics Center Project

DeLorme (1:250,000 series)



BFSA Environmental Services
A Perennial Company

Figure 2

Project Location Map

The Collins Logistics Center Project

USGS *Orange* and *Anaheim* Quadrangles (7.5-minute series)

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:

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.

County of Orange

Section 2-5-27(c) of Article 2 of the Codified Ordinances of Orange County includes protection measures for "natural, cultural, structural, and archeological resources" in recreational areas and mandates that:

> No person shall possess, destroy, injure, deface, remove, dig, or disturb from its natural state any fossilized or nonfossilized paleontological specimens, cultural or archaeological resources, or the parts thereof in any park, beach or recreational facility. (County of Orange 2005)

Similarly, Section 2-5-227(c) of Article 9 of the Codified Ordinances of Orange County includes protection measures for "natural, cultural, structural, and archeological resources" in privately owned parks and mandates that:

> No person shall possess, destroy, injure, deface, remove, dig, or disturb from its natural state any fossilized or nonfossilized paleontological specimens, cultural or archaeological resources, or the parts thereof in any designated park. (County of Orange 2005)

Eisentraut and Cooper (2002) introduced a curation model with monitoring and mitigation guidelines for the conservation of archaeological and paleontological materials in the

County of Orange. This document and its recommendations were subsequently adopted by the Orange County Board of Supervisors and now provide a standard for the paleontological profession to use in the paleontological mitigation process in Orange County. In 2009, the John D. Cooper Archaeology and Paleontology Center ("the Cooper Center") was formally organized in Santa Ana with the intent to provide a repository to receive future incoming collections. Operation of the Cooper Center was initially a joint partnership between the County of Orange and California State University, Fullerton. In 2019, Orange County Parks (OC Parks) took over administration of the facility.

City of Orange

Paleontological resources are not covered in the City's general plan or environmental impact report (City of Orange 2010).

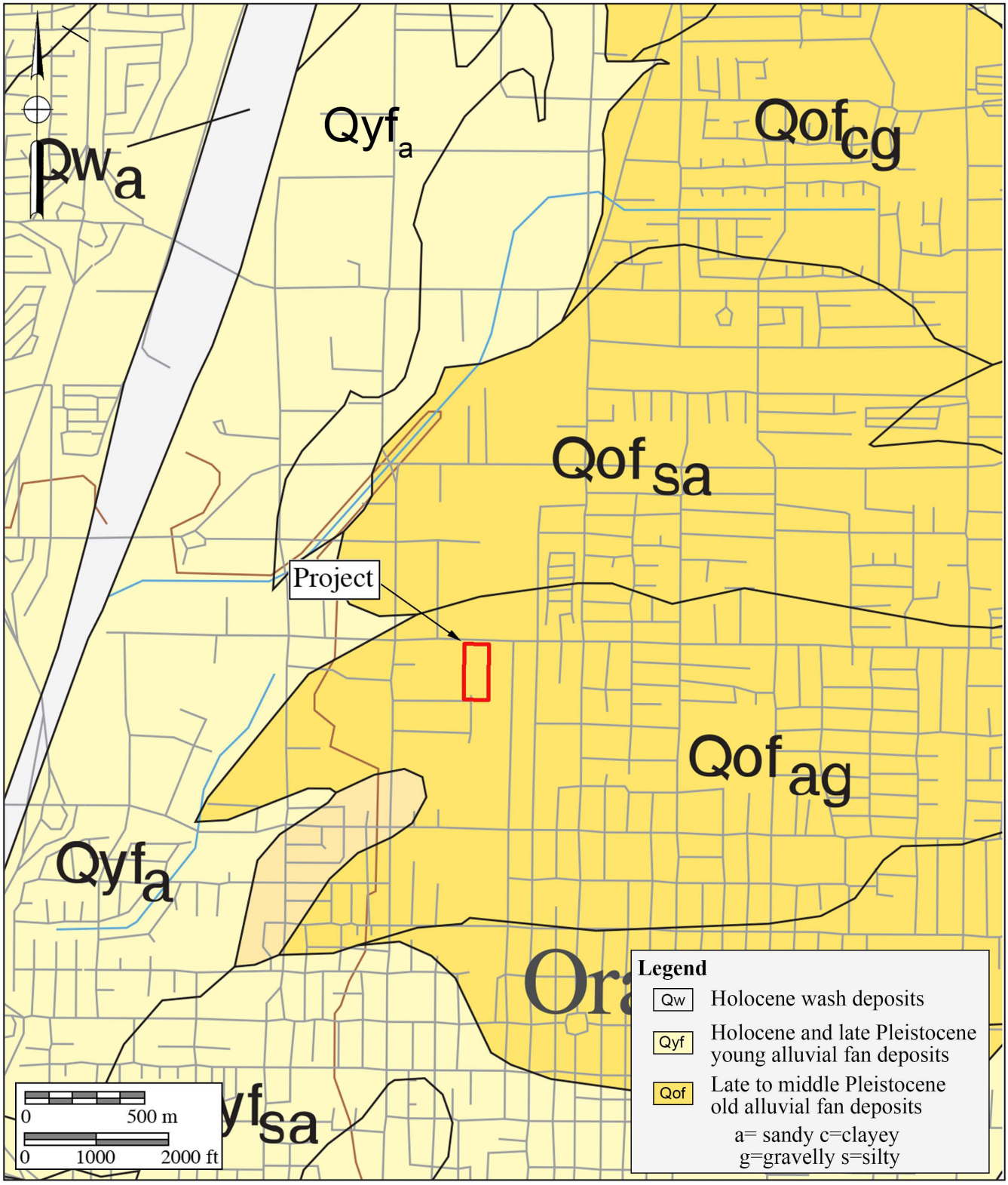
III. GEOLOGY

The current path of the Santa Ana River lies approximately one mile west of the project. Geologically, the surficial sediments across the project are mapped as late to middle Pleistocene-aged old alluvial fan deposits (amber areas labeled "Qof_{ag}" on Figure 3), mostly consisting of unconsolidated, alluvial silty sands (Morton and Miller 2006). These deposits represent the erosional detritus transported and deposited by Santiago Creek, east of the project, during the wetter climatic conditions of the Pleistocene.

IV. PALEONTOLOGICAL RESOURCES

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 Section II of this report).



BFSA Environmental Services
A Perennial Company

Figure 3

Geologic Map

The Collins Logistics Center Project

Geology after Morton and Miller (2006)

Fossil Locality Search

Fossil locality record searches conducted for prior projects by BFSA were consulted to research potential nearby fossil localities. Sources for locality data are from the Natural History Museum of Los Angeles County (LACM) and OC Parks. The records searches indicate that no fossil localities were identified within the project boundaries or close to the project. The nearest listed fossil locality is that of a Pleistocene sheep discovered during a housing development along South Rio Vista Street in Anaheim, about 2.5 miles north of the project (LACM locality [loc.] 1652). Remains of a Pleistocene proboscidean (elephant family) were found approximately four miles to the northeast along Richfield Road in Placentia (LACM loc. 3292). From prior records searches, OC Parks indicated that they have no nearby fossil localities in similar sedimentary deposits as the current project.

A review of published and unpublished literature was conducted for potential paleontological resources that may be known in the vicinity of the project. Data reported in Miller (1971) indicate there are no nearby fossil localities. Jefferson (1991) lists a late Pleistocene-aged specimen of horse located at "Glasell [Street] and Fletcher [Avenue]" in Orange (LACM loc. 4943), about two miles north of the project.

V. PALEONTOLOGICAL SENSITIVITY

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 that might have been conducive to the accumulation of organic remains that might 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 is therefore typically assigned a low paleontological sensitivity. Pleistocene (more than 11,700 years old) alluvial and alluvial fan deposits in the Los Angeles Basin, however, often yield important Ice Age terrestrial vertebrate fossils, such as extinct mammoths, mastodons, giant ground sloths, extinct species of horse, bison, and camel, saber-toothed cats, and others (Jefferson 1991). These Pleistocene sediments are accorded a high paleontological resource sensitivity.

Professional Standards

The Society of Vertebrate Paleontology (SVP 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; 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 a Pleistocene age for the surficial sedimentary deposits at the project, Pleistocene vertebrate fossils in the area, and the regional geology, a high paleontological potential may be assigned to the project.

VI. CONCLUSIONS AND RECOMMENDATIONS

The existence of Pleistocene old alluvial fan deposits at the surface of the project, the high paleontological resource sensitivity assigned to these sediments, and the presence of previously recorded fossil specimens from the similar deposits less than five miles of the property all support the recommendation that full-time paleontological monitoring be required starting at a depth of five feet below the surface during grading, excavation, or utility trenching activities at the project. The project paleontologist should have the discretion of adjusting the monitoring schedule based on any changing geological conditions observed during monitoring.

A paleontological resource impact monitoring program (PRIMP) is proposed and must be consistent with the provisions of CEQA, the City of Orange, and those of the guidelines of the SVP (2010). If implemented, the PRIMP would mitigate any adverse impacts (loss or destruction) to potential nonrenewable paleontological resources (fossils), if present, to less than significant. A proposed paleontological mitigation monitoring program is as follows:

1. Prior to initiation of any grading, drilling, and/or excavation activities, a preconstruction meeting will be held and attended by the paleontologist of record, representatives of the grading contractor and subcontractors, the project owner or developer, and a representative of the lead agency. The nature of potential paleontological resources shall be discussed, as well as the protocol that is to be implemented following discovery of any fossiliferous materials.
2. Monitoring of mass grading and excavation activities shall be performed by a qualified paleontologist or paleontological monitor. Monitoring will be conducted full-time in areas of grading or excavation in undisturbed sediments of Pleistocene

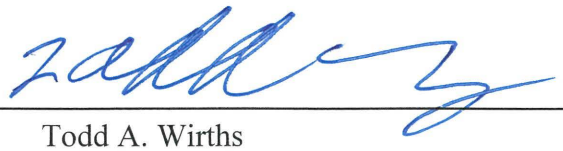
old alluvial fan deposits starting at a depth of five feet. The project paleontologist should have the discretion of adjusting the monitoring schedule based on any changing geological conditions observed during monitoring.

3. Paleontological monitors will be equipped to salvage fossils as they are unearthed to avoid construction delays. The monitor must be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens in a timely manner. Monitoring may be reduced if the potentially fossiliferous units are not present in the subsurface or, if present, are determined upon exposure and examination by qualified paleontological personnel to have low potential to contain fossil resources.
4. Paleontological salvage during trenching and boring activities is typically from the generated spoils and does not delay the trenching or drilling activities. Fossils are collected and placed in cardboard flats or plastic buckets and identified by field number, collector, and date collected. Notes are taken on the map location and stratigraphy of the site, and the site is photographed before it is vacated and the fossils are removed to a safe place. On mass grading projects, any discovered fossil site is protected by red flagging to prevent it from being overrun by earthmovers (scrapers) before salvage begins. Fossils are collected in a similar manner, with notes and photographs being taken before removing the fossils. Precise location of the site is determined with the use of handheld Global Positioning System units. If the site involves a large terrestrial vertebrate, such as large bone(s) or a mammoth tusk, that is/are too large to be easily removed by a single monitor, a fossil recovery crew will excavate around the find, encase the find within a plaster and burlap jacket, and remove it after the plaster is set. For large fossils, use of the contractor's construction equipment is solicited to help remove the jacket to a safe location before it is returned to the laboratory facility for preparation.
5. Isolated fossils are collected by hand, wrapped in paper, and placed in temporary collecting flats or five-gallon buckets. Notes are taken on the map location and stratigraphy of the site, and the site is photographed before it is vacated and the fossils are removed to a safe place.
6. Particularly small invertebrate fossils typically represent multiple specimens of a limited number of organisms, and a scientifically suitable sample can be obtained from one to several five-gallon buckets of fossiliferous sediment. If it is possible to dry-screen the sediment in the field, a concentrated sample may consist of one or two buckets of material. For vertebrate fossils, the test is usually the observed presence of small pieces of bones within the sediments. If present, multiple five-gallon buckets of sediment can be collected and returned to a separate facility to wet-screen the sediment.

7. In accordance with the "Microfossil Salvage" section of the Society of Vertebrate Paleontology guidelines (2010:7), bulk sampling and screening of fine-grained sedimentary deposits (including carbonate-rich paleosols) must be performed if the deposits are identified to possess indications of producing fossil "microvertebrates" in order to test the feasibility of the deposit to yield fossil bones and teeth.
8. In the laboratory, individual fossils are cleaned of extraneous matrix, any breaks are repaired, and the specimen, if needed, is stabilized by soaking in an archivally approved acrylic hardener (*e.g.,* a solution of acetone and Paraloid B-72).
9. Preparation of recovered specimens to a point of identification and permanent preservation (not display), including screen-washing sediments to recover small invertebrates and vertebrates. Preparation of individual vertebrate fossils is often more time-consuming than for accumulations of invertebrate fossils.
10. Identification and curation of specimens into a professional, accredited public museum repository with a commitment to archival conservation and permanent retrievable storage (*e.g.,* OC Parks in Santa Ana, California). The paleontological program should include a written repository agreement prior to the initiation of mitigation activities. The lead agency may select another repository if it so desires.
11. Preparation of a final monitoring and mitigation report of findings and significance, including lists of all fossils recovered and necessary maps and graphics to accurately record their original location(s). The report, when submitted to and accepted by the appropriate lead agency, will signify satisfactory completion of the project program to mitigate impacts to any potential nonrenewable paleontological resources (*i.e.,* fossils) that might have been lost or otherwise adversely affected without such a program in place.

VII. 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 12, 2023

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

Date

VIII. REFERENCES

City of Orange. 2010. City of Orange General Plan. Electronic document, https://www.cityoforange.org/our-city/departments/community-development/general-plan, accessed December 5, 2022.

County of Orange. 2005. County Ordinances, Division 5; Revised: February 2005. Electronic document, https://occonservation.org/wp-content/uploads/2020/05/RPRT-Closures.pdf, accessed December 5, 2022.

Eisentraut, P.J. and Cooper, J.D. 2002. Final Report, Development of a model curation program for Orange County's Archaeological & Paleontological Collections. Unpublished report prepared for the County of Orange, Public Facilities and Resources Department, Harbors, Beaches and Parks, Santa Ana, California.

Jefferson, G.T. 1991. A catalogue of late Quaternary vertebrates from California: Part two, mammals. Natural History Museum of Los Angeles County, Technical Reports, no. 7:I–v + 1–129.

Miller, W.E. 1971. Pleistocene vertebrates of the Los Angeles Basin and vicinity (exclusive of Rancho La Brea). *Bulletin of the Los Angeles County Museum of Natural History; Science* (Number 10, 124 pp.).

Morton, D.M. and Miller, F.K. 2006. Geologic map of the San Bernardino and Santa Ana 30' x 60' quadrangles, California: U.S. Geological Survey Open-File Report 06-1217, scale 1:100,000.

Society of Vertebrate Paleontology. 2010. Standard procedures for the assessment and mitigation of adverse impacts to paleontological resources; by the SVP Impact Mitigation Guidelines Revision Committee. Electronic document, https://vertpaleo.org/wp-content/uploads/2021/01/SVP_Impact_Mitigation_Guidelines-1.pdf.

APPENDIX A

Qualifications of Key Personnel

Todd A. Wirths, MS, PG No. 7588

Senior Paleontologist

BFSA Environmental Services, A Perennial Company
14010 Poway Road • Suite A •
Phone: (858) 679-8218 • Fax: (858) 679-9896 • E-Mail: twirths@bfsa.perennialenv.com

Education

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

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

Professional Certifications

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

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

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

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.