

PALEONTOLOGICAL ASSESSMENT FOR THE CITRUS ESTATES PROJECT

CITY OF REDLANDS,
SAN BERNARDINO COUNTY, CALIFORNIA

APN 168-132-05

Prepared for:

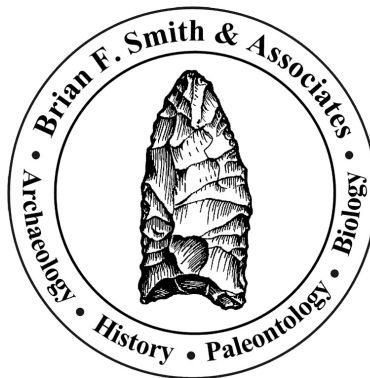
Pulte Group
27401 Los Altos, Suite 400
Mission Viejo, California 92691

Submitted to:

City of Redlands
35 Cajon Street
Redlands, California 92373

Prepared by:

Brian F. Smith and Associates, Inc.
14010 Poway Road, Suite A
Poway, California 92064



September 29, 2021

Paleontological Database Information

Author: Todd A. Wirths, M.S., Senior Paleontologist, California
Professional Geologist No. 7588

Consulting Firm: Brian F. Smith and Associates, Inc.
14010 Poway Road, Suite A
Poway, California 92064
(858) 679-8218

Report Date: September 29, 2021

Report Title: Paleontological Assessment for the Citrus Estates Project, City of
Redlands, San Bernardino County, California (APN 168-132-05)

Prepared for: Pulte Group
27401 Los Altos, Suite 400
Mission Viejo, California 92691

Submitted to: City of Redlands
35 Cajon Street
Redlands, California 92373

Prepared by: Brian F. Smith and Associates, Inc.
14010 Poway Road, Suite A
Poway, California 92064

USGS Quadrangle: Section 24, Township 1 South, Range 3 West, San Bernardino
Baseline and Meridian *Redlands, California* (7.5-minute)

Study Area: approximately 38 acres

Key Words: Paleontological assessment; Holocene young axial-valley
deposits; low sensitivity; no monitoring; City of Redlands.

Table of Contents

<u>Section</u>	<u>Page</u>
I. INTRODUCTION AND LOCATION.....	1
II. REGULATORY SETTING	1
<i>State of California</i>	4
<i>City of Redlands</i>	4
III. GEOLOGY	5
IV. PALEONTOLOGICAL RESOURCES.....	7
<i>Definition</i>	7
<i>Fossil Locality Search</i>	7
V. PALEONTOLOGICAL SENSITIVITY	7
<i>Overview</i>	7
<i>Professional Standards</i>	8
VI. CONCLUSION AND RECOMMENDATIONS	8
<i>Mitigation Monitoring and Reporting Program (MMRP)</i>	9
VII. CERTIFICATION.....	11
VIII. REFERENCES CITED.....	11

Appendices

Appendix A – Qualifications of Key Personnel

List of Figures

<u>Figure</u>	<u>Page</u>
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 for the Citrus Estates Project, located between San Bernardino Avenue and Capri Avenue, and Wabash Avenue and Granite Street, in the city of Redlands, San Bernardino County, California (Figures 1 and 2). The project consists of one parcel (Assessor's Parcel Number 168-132-05) totaling approximately 38 acres. On the U.S. Geological Survey 7.5-minute, 1:24,000-scale *Redlands, California* topographic quadrangle map, the project is located in Section 24, Township 1 South, Range 3 West, of the San Bernardino Baseline and Meridian. The project parcel is disturbed, having previously been utilized for agricultural purposes throughout the latter half of the twentieth century. The project is an entitlement of a proposed development of 98 single-family detached homes. Earth disturbance cuts of up to 10 feet deep are planned to accomplish the proposed improvements (Hertzberg and Okubo 2021).

As the lead agency, the City of Redlands 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; 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 flat and has been previously disturbed.

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.

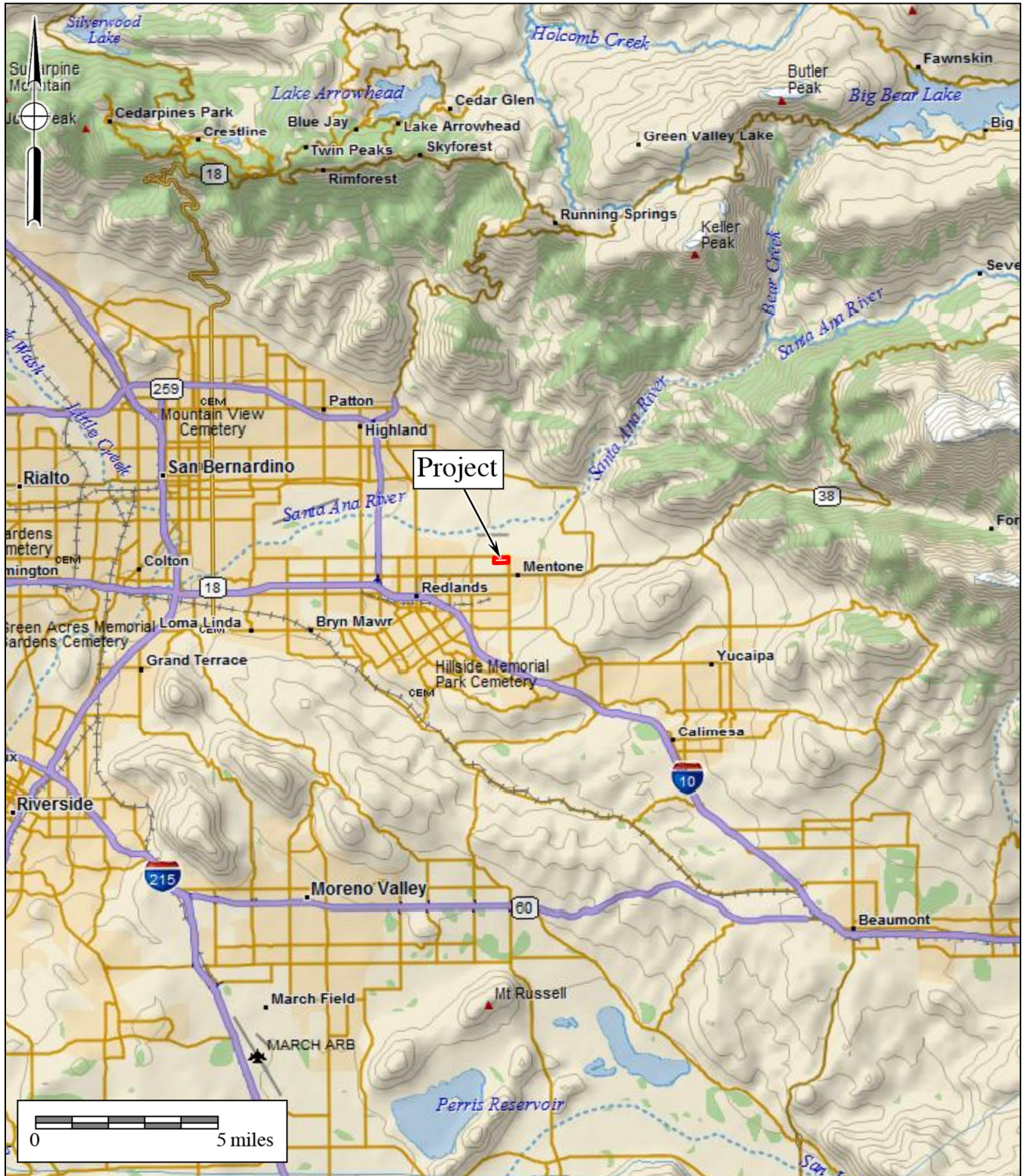


Figure 1
General Location Map
 The Citrus Estates Project
 DeLorme (1:250,000)



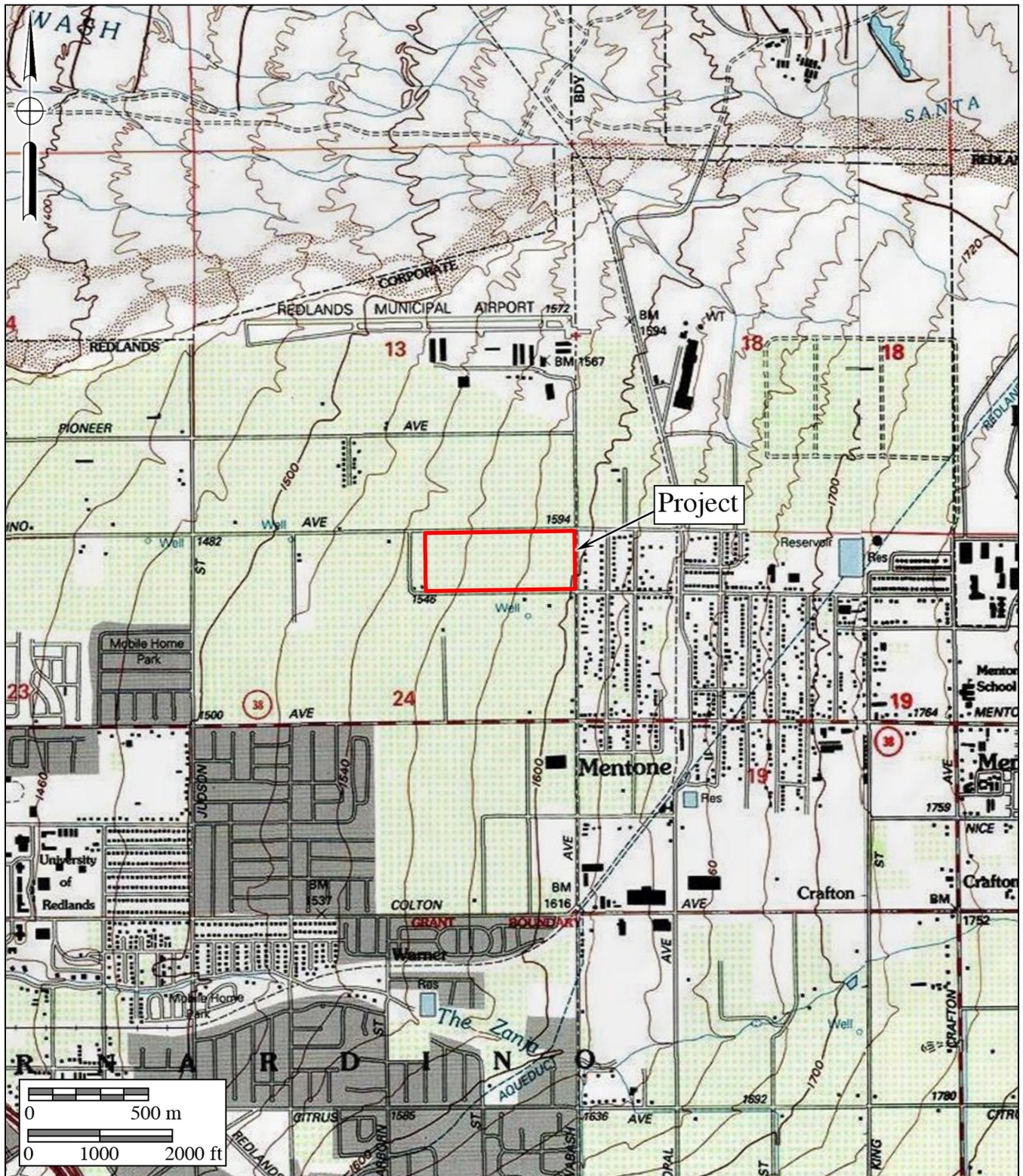


Figure 2
Project Location Map
 The Citrus Estates Project

USGS Redlands and Yucaipa Quadrangles (7.5-minute series)



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.

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 by which 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.

City of Redlands

The Draft Environmental Impact Report prepared for the City of Redlands General Plan Update contains policies that propose to reduce impacts to paleontological resources (City of Redlands 2017). Specific attention is devoted to the San Timoteo Canyon area of the city (Impact 3.8-4), where, despite the presence of fossiliferous strata, impacts to paleontological resources are considered low, due to a low development potential. In other areas of the city, the majority of development under the proposed General Plan is stated as limited to redevelopment or to new development in existing developed areas, and potential impacts are considered limited. Nevertheless, the General Plan contains policies to reduce impacts, including the preparation of a paleontological assessment to evaluate the potential impacts of a proposed project to paleontological resources (Principles 2-P.16 and 2-P.17), and for resource actions, including paleontological monitoring (if deemed necessary) and measures to evaluate and record encountered paleontological materials (Actions 2-A.75, 2-A.76) (City of Redlands 2017). Resource actions 2-A.75 and 2-A.76 are stated below:

2-A.75 Require, as a standard condition of approval, that project applicants provide an assessment as to whether grading for the Proposed Project would impact underlying soil units or geologic formations that have a moderate to high potential to yield fossiliferous materials, prior to issuance of a grading permit. If the potential for fossil discovery is moderate to high, require applicants to provide a paleontological monitor during rough grading of the project.

2-A.76 Establish a procedure for the management of paleontological materials found onsite during a development, including the following provisions:

- If materials are found on-site during grading, require that work be halted until a qualified professional evaluates the find to determine if it represents a significant paleontological resource.
- If the resource is determined to be significant, the paleontologist shall supervise removal of the material and determine the most appropriate archival storage of the material.
- Appropriate materials shall be prepared, catalogued, and archived at the applicant's expense and shall be retained within San Bernardino County if feasible.

III. GEOLOGY

Geomorphically, the project is located on the gently westerly-sloping alluvial floodplain of the Santa Ana River. The geologically young alluvial sediments across the project are mapped as “young axial-valley deposits” of middle to late Holocene age (Qya3 [middle Holocene] and Qya4 and Qya5 [late Holocene] on the published geologic map of the Redlands Quadrangle (Figure 3, after Matti et al. 2003). The sediments consist of slightly to moderately consolidated silt, sand, and gravel that have slightly to moderately developed pedogenic soil profiles.

A project-specific geotechnical investigation was recently performed by Leighton and Associates (Hertzberg and Okubo 2021). Results from exploratory trenches ranging in depth from four to eight feet deep indicate that mostly sand, gravel, cobbles, and boulders underlie the project. Notably, the investigation indicated that boulders up to four feet across were present, and that approximately 10% of the materials encountered, by volume, consisted of boulders greater than 12 inches in length.

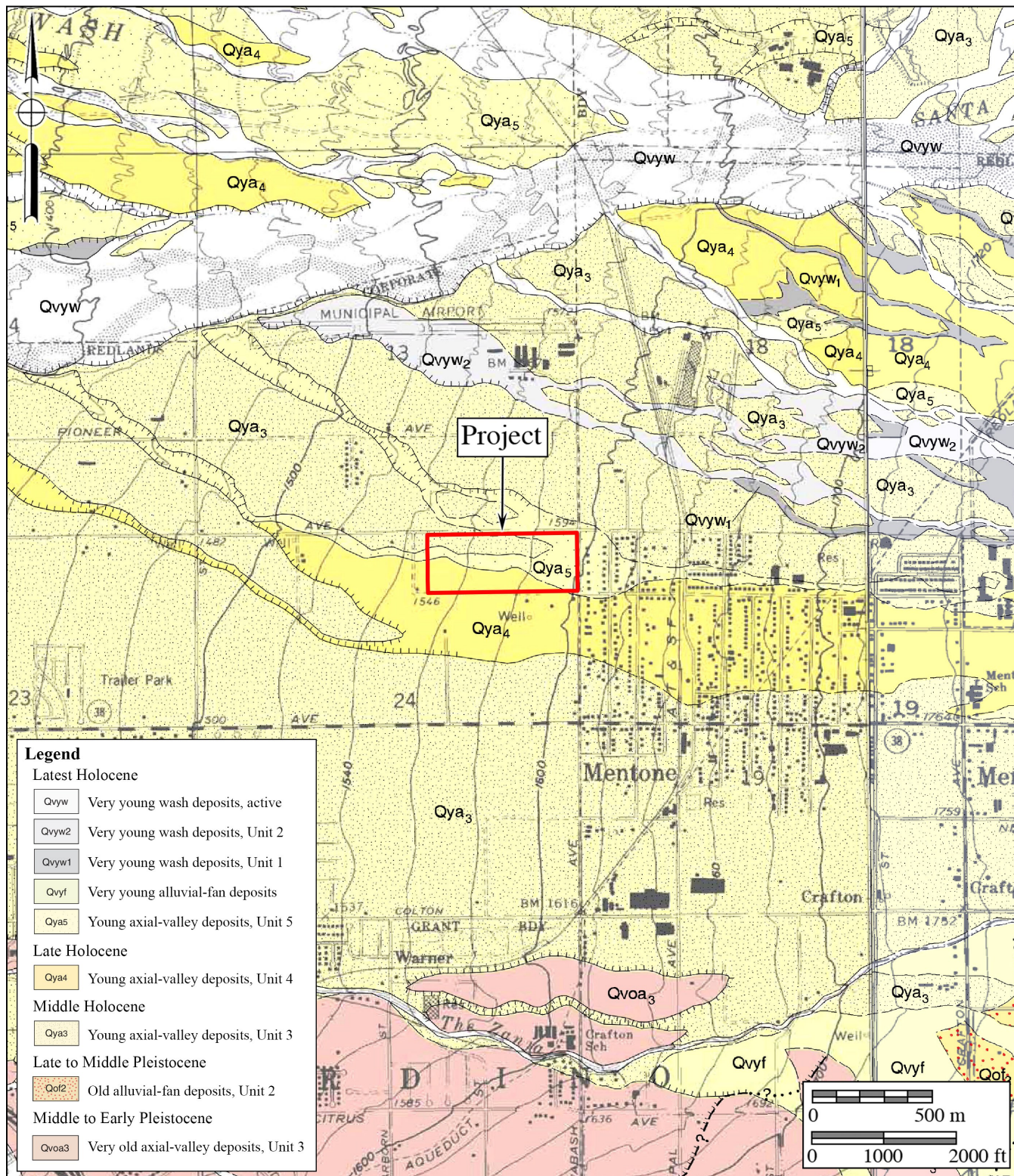


Figure 3
Geologic Map

The Citrus Estates Project

Geology after Matti et al. 2003a and 2003b



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) when viewed in the context of local extinction of the organism or habitat, for example. Fossils are considered a nonrenewable resource under state and local guidelines (Section II of this report).

Fossil Locality Search

A paleontological literature review and collections and locality records search was conducted for the project using records obtained from prior projects at Brian F. Smith and Associates from the Division of Geological Sciences at the San Bernardino County Museum, the Los Angeles County Museum of Natural History, the Western Science Center in Hemet, and data from published and unpublished paleontological literature (Jefferson 1986, 1991, 2009). The resulting locality records search did not identify any previously recorded fossil localities from within the boundaries of the project. The closest-known locality is located over six miles southeast of the project in Calimesa, consisting of the Pleistocene-aged “Shutt Ranch fauna” (Reynolds 2017). Fossil remains from the Shutt Ranch fauna include bones from two species of rabbits, several species of rodents, giant ground sloth, possible dire wolf, and gomphothere (a type of mastodon) (Reynolds and Reeder 1986; Jefferson 2009).

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 thus typically assigned a low paleontological sensitivity. Old, Pleistocene (>11,700-year-old) alluvial and alluvial fan deposits in the Inland Empire, however, often yield important 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 thus accorded a High paleontological resource sensitivity.

Professional Standards

The Society of Vertebrate Paleontology 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 upon 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 young geologic age of the sediments mapped at the project, their extreme coarseness, and the lack of nearby significant fossil localities, the axial-valley deposits can be considered to have a low potential to yield significant paleontological resources.

VI. CONCLUSIONS AND RECOMMENDATIONS

Research has confirmed the existence of Holocene, very coarse young axial-valley deposits (“Qya” on Figure 3) that are mapped at the surface of the project. Based on the lack of known significant fossil localities nearby and a low sensitivity rating typically assigned to Holocene-aged cobbly and bouldery deposits for yielding paleontological resources, it is recommended that paleontological monitoring not be implemented during mass grading and excavation activities in order to mitigate any adverse impacts (loss or destruction) to potential nonrenewable paleontological resources. Monitoring for paleontological resources does not appear warranted at the project.

However, should paleontological resources be discovered at any time during earth disturbance activities at the project, a Mitigation Monitoring and Reporting Program (MMRP) is provided below. Paleontological monitoring may be reduced or increased based upon the observations and recommendations of the professional-level project paleontologist. The following MMRP, when implemented, would reduce potential impacts of paleontological resources to a level below significant:


Mitigation Monitoring and Reporting Program (MMRP)

1. If paleontological resources (fossils) are discovered, earth disturbance activities should stop, and the fossil location shall be protected and cordoned off at a distance of 50 feet in all directions. A qualified paleontologist should be notified immediately to determine the significance of the discovery. After examination of the fossil(s), and if the paleontologist determines the fossil(s) to be significant, monitoring for paleontological resources is warranted.
2. Monitoring of mass grading and excavation activities in areas identified as likely to contain paleontological resources shall be performed by the paleontological monitor. Monitoring will be conducted in areas of grading or excavation in undisturbed sediments. The duration of monitoring shall be determined by the qualified project paleontologist.
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. The monitor shall notify the project paleontologist, who will then notify the concerned parties of the discovery.
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, which is photographed before it is vacated and the fossils are removed to a safe place. On mass grading projects, discovered fossil sites are protected by flagging to prevent them 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 GPS units. If the site involves remains from 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 shall 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 may be solicited to help remove the jacket to a safe location.
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, which is photographed before it is vacated and the fossils are removed to a safe place.

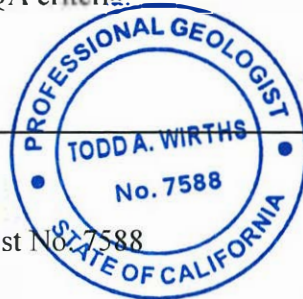
6. Particularly small invertebrate fossils typically represent multiple specimens of a limited number of organisms, and a scientifically suitable sample can be obtained from one to several five-gallon buckets of fossiliferous sediment. If it is possible to dry screen the sediment in the field, a concentrated 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, as many as 20 to 40 five-gallon buckets of sediment can be collected and returned to a separate facility to wet-screen the sediment.
7. 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).
8. Recovered specimens are prepared 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.
9. Identification and curation of specimens into a professional, accredited public museum repository with a commitment to archival conservation and permanent retrievable storage (*e.g.*, the San Bernardino County Museum) shall be conducted. The paleontological program should include a written repository agreement prior to the initiation of mitigation activities. Prior to curation, the lead agency (*e.g.*, the City of Redlands) will be consulted on the repository/museum to receive the fossil material.
10. A final report of findings and significance will be prepared, 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.



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



September 29, 2021

Date

VIII. REFERENCES

- City of Redlands. 2017. City of Redlands General Plan: Update and Climate Action Plan, Environmental Impact report, Revised draft | July 21, 2017, SCH: #2016081041. https://www.cityofredlands.org/sites/main/files/file-attachments/redlands_deir_compiled_lo_071917_0.pdf?1554321669.
- Hertzberg, J.D., and Okubo, S.G. 2021. Report of geotechnical due diligence exploration, Redlands 38, southwest of San Bernardino and Wabash avenues, City of Redlands, California. Unpublished consulting report for the Pulte Group, Mission Viejo, California, by Leighton and Associates, Inc., Rancho Cucamonga, California.
- Jefferson, G.T. 1986. Fossil vertebrates from the late Pleistocene sedimentary deposits in the San Bernardino and Little San Bernardino Mountains region, *in*, Kooser, M.A., and Reynolds, R.E., eds., *Geology around the margins of the eastern san Bernardino Mountains*. Publications of the Inland Geological Society, v. 1, Redlands, 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.
- Jefferson, G.T. 2009. A catalogue of Blancan and Irvingtonian vertebrates and floras from Arizona, southern California, Nevada, Utah, and northwestern Mexico. Unpublished incomplete draft manuscript, Colorado Desert District Stout Research Center, Anza-Borrego Desert State Park, Borrego Springs, California. Dated March 11, 2009.

- Matti, J.C., Morton, D.M., and Cox, B.F. 2003. Geologic map of the Yucaipa 7.5' quadrangle, San Bernardino and Riverside Counties, California, v. 1.0, U.S. Geological Survey, Open-File Report 03-301.
- Reynolds, R.E. 2017. Review of the Blacan / Irvingtonian transition in the northern Peninsular Range Province of southern California, *in*, Reynolds, R.E., ed., ECSZ Does It, Revisiting the Eastern California Shear Zone. California State University Desert Studies Center 2017 Desert Symposium Field Guide and Proceedings.
- Reynolds, R.E., and Reeder, W.A. 1986. Age and fossil assemblages of the San Timoteo Formation, Riverside County, California, *in*, Kooser, M.A., and Reynolds, R.E., eds., Geology around the margins of the eastern san Bernardino Mountains. Publications of the Inland Geological Society, v. 1, Redlands, California.
- 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: http://vertpaleo.org/Membership/Member-Ethics/SVP_Impact_Mitigation_Guidelines.aspx.

APPENDIX A

Qualifications of Key Personnel

Todd A. Wirths, MS, PG No. 7588

Senior Paleontologist

Brian F. Smith and Associates, Inc.

14010 Poway Road • Suite A •

Phone: (858) 679-8218 • Fax: (858) 679-9896 • E-Mail: twirths@bfsa-ca.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.