PALEONTOLOGICAL ASSESSMENT FOR THE LUNA AND FREMONTIA (TM 20527) PROJECT

CITY OF VICTORVILLE
SAN BERNARDINO COUNTY, CALIFORNIA

TM 20527
APNs 3096-341-04 and -09

Prepared on Behalf of:

Lilburn Corporation
1905 Business Center Drive
San Bernardino, California 92408

Prepared for:

City of Victorville
14343 Civic Drive
Victorville, California 92393

Prepared by:

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

June 27, 2022

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
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Report Title:	Paleontological Assessment for the Luna and Fremontia (TM 20527) Project, City of Victorville, San Bernardino County, California
Prepared on Behalf of:	Lilburn Corporation 1905 Business Center Drive San Bernardino, California 92408
Prepared for:	City of Victorville 14343 Civic Drive Victorville, California 92393
Prepared by:	Brian F. Smith and Associates, Inc. 14010 Poway Road, Suite A Poway, California 92064
Assessor's Parcel Numbers:	3096-341-04 and -09
USGS Quadrangle:	Section 28, Township 5 North, Range 5 West, *Baldy Mesa*, *California* (7.5 minute) Quadrangle.
Study Area:	20.07 acres
Key Words:	Paleontological assessment; Pleistocene alluvial deposits; High sensitivity; City of Victorville.

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I. INTRODUCTION AND LOCATION

A paleontological resource assessment has been completed for the Luna and Fremontia (TM 20527) Project, located southwest of the intersection of Luna and Fremontia roads in the city of Victorville, San Bernardino County, California (Figures 1 and 2). The 20.07-acre project consists of two parcels, identified as Assessor's Parcel Numbers (APN) 3096-341-04 and -09. On the United States Geological Survey (7.5-minute), 1:24,000-scale *Baldy Mesa, California* topographic quadrangle map, the project is situated in Section 28, Township 5 North, Range 5 West, of the San Bernardino Baseline and Meridian. The construction of a 53-lot, single-family residential subdivision with associated landscaping and infrastructure is proposed for the project. In addition, a natural drainage along the western boundary of the project is proposed for over-excavation, to be re-engineered as a concrete-sided, earthen-bottomed channel. The channel will be approximately 7.5 feet deep, with another six feet planned for construction of the channel walls, for a total depth of disturbance of about 13.5 feet. A total of 5,864 cubic yards of cut is proposed to accomplish the improvements. Currently, the project property is undeveloped.

As the lead agency, the City of Victorville 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 for a previous project in the area; a review of the underlying geology; and recommendations to mitigate impacts to potential paleontological resources, if necessary.

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.

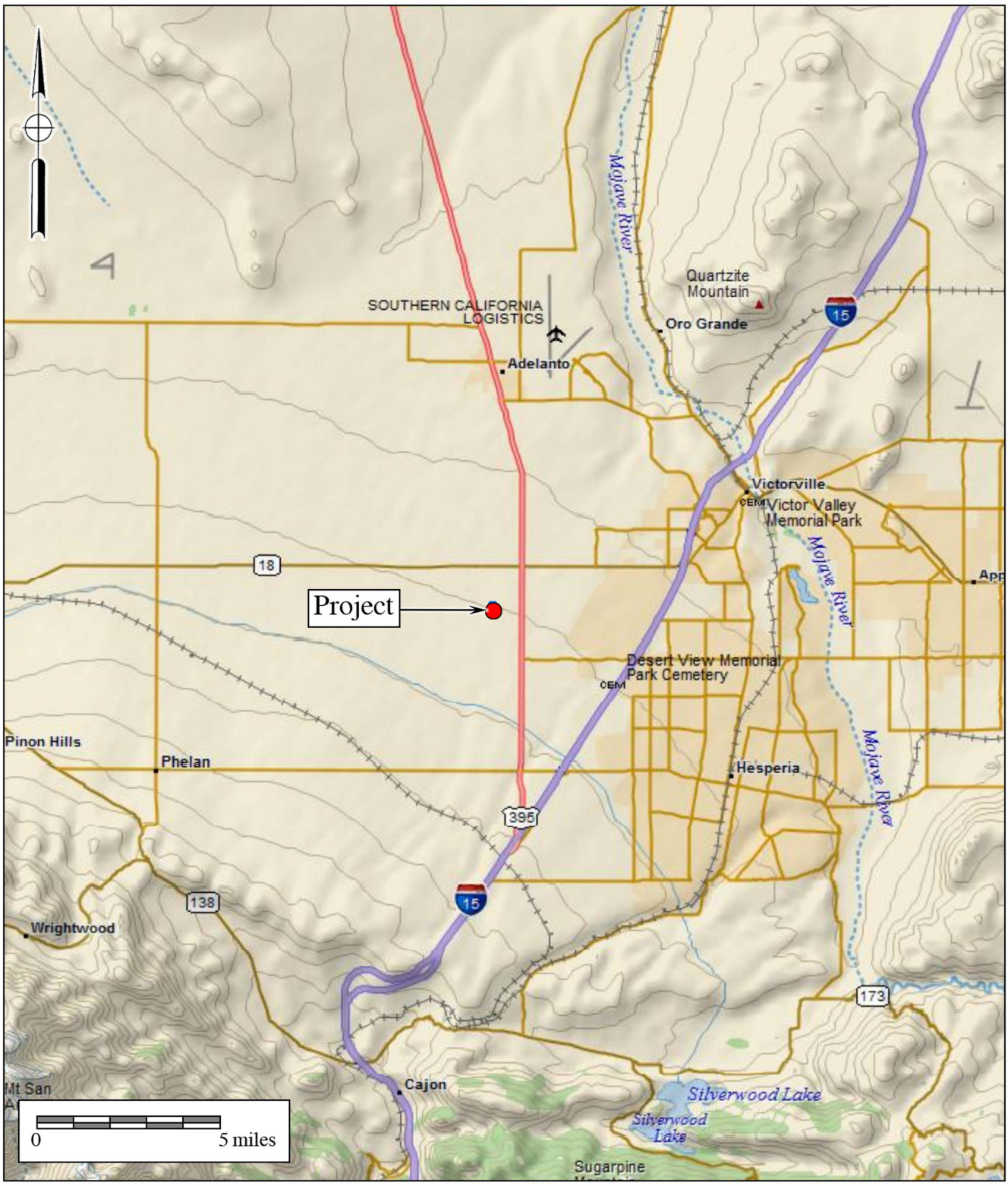

Figure 1

General Location Map

The Luna and Fremontia (TM 20527) Project

DeLorme (1:250,000 series)

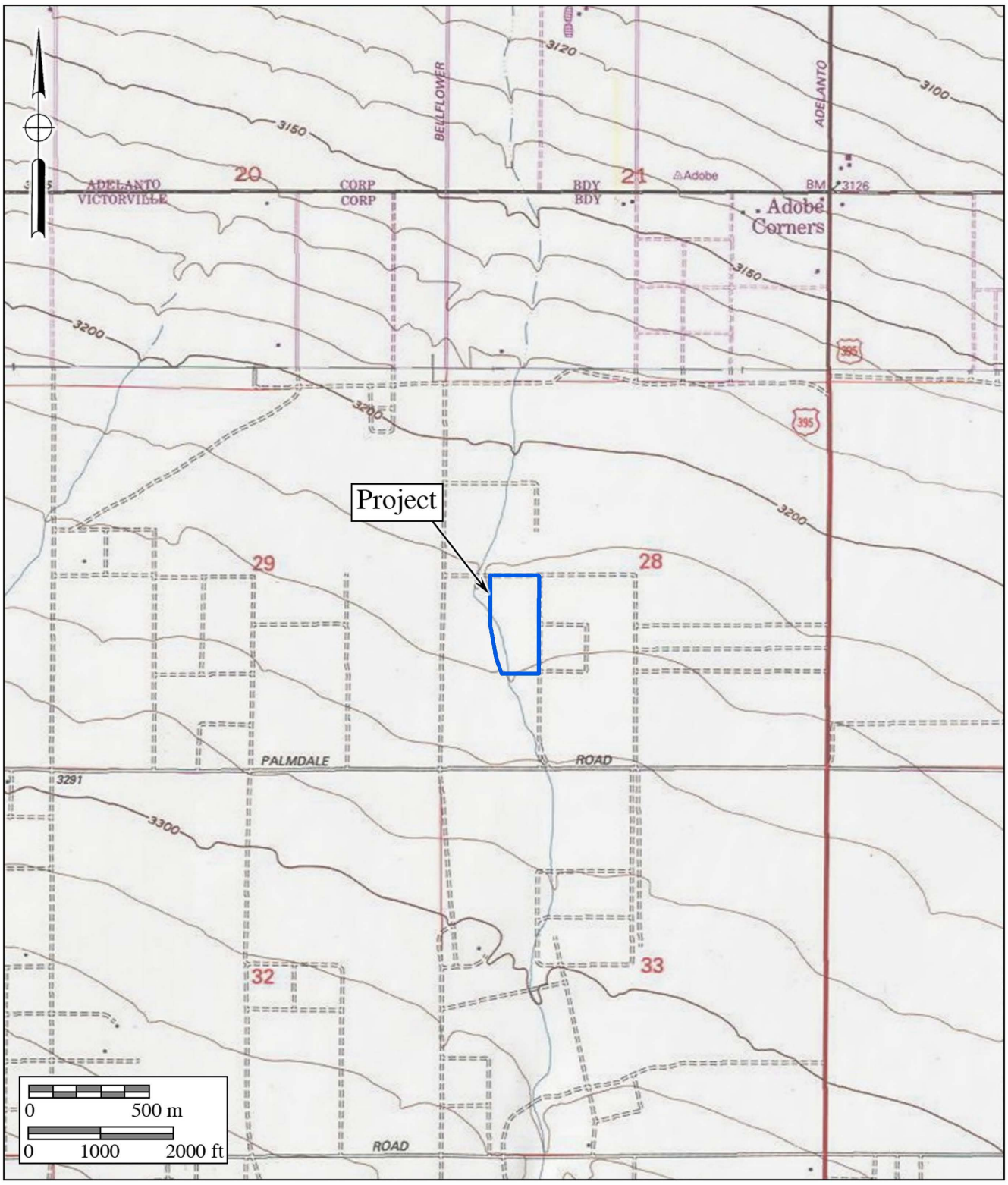

Figure 2

Project Location Map

The Luna and Fremontia (TM 20527) Project

USGS *Baldy Mesa* and *Adelanto* 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.

City of Victorville

In the Final Environmental Impact Report (EIR) of the City of Victorville General Plan, paleontological resource mitigation measures are specified in CUL-1. For previously undeveloped properties greater than one acre, mitigation measure CUL-1 must be implemented before construction starts (City of Victorville 2008a). The measure is as follows:

> CUL-1: The applicant shall provide for an on-site paleontological/archaeological inspector to monitor all grading operations, or a letter from said licensed professional indicating that monitoring is not necessary during grading. Further, if disturbed resources are required to be collected and preserved, the applicant shall be required to participate financially up to the limits imposed by Public Resources Code Section 21083.2. The results of said monitoring shall be filed with the Development Director or his designee prior to the final approval of the development. (City of Victorville 2008a)

III. GEOLOGY

The project is situated over the Victorville Basin, a structural depression about 40 kilometers wide and filled with sediments up to 1,300 meters thick, a succession of deposits ranging in age from middle Miocene through late Pleistocene time. The Victorville Basin is bordered by the San Gabriel and San Bernardino Mountains to the south, and along the north, local peaks and ridges of pre-Cenozoic basement rocks in the areas of Quartzite Mountain and

the southeastern Shadow Mountains. These deposits record the erosional and depositional cycles of the region during episodes of crustal slip along the San Andreas Fault, along with the coeval uplift and trans-rotation of the San Bernardino and San Gabriel Mountains. A major feature of the area is the evolution of the northward-flowing ancestral Mojave River. Between the Cajon Pass and Victorville, and at the project, the main geomorphic attribute of the surface is the Victorville Fan, a broad piedmont or bajada. The fan was active between roughly one-half million years to about middle to late Pleistocene times (Cox et al. 2003).

As shown on Figure 3 (after Morton and Miller 2006), the project overlies early Holocene young wash deposits, Unit 2 (off-white linear areas labeled "Qyw_2") and middle Holocene young alluvial fan deposits, Unit 3 (pale gray areas labeled "Qyf_3"). The wash deposits are generally composed of silts, sands, and coarse-grained sands to cobbles, while the fan deposits are composed of homogeneous brown silts and sands with sparse granule and pebble lenses and scattered, matrix-supported, pebble-sized clasts. The fan surfaces are slightly to moderately dissected, and locally show low amplitude, rolling surfaces with swales and ridges parallel to the axes of the fans (Morton and Miller 2006). In the attached paleontological records search for the project, the Holocene alluvial deposits are as little as three feet thick in the area, and are underlain by Pleistocene-aged alluvial deposits that may contain fossils (Kottcamp 2022).

Approximately five miles east of the project are deposits of the Pleistocene and Pliocene-aged "alluvium of the ancestral Mojave River" (Hernandez et al. 2008). The current configuration of the Mojave River has developed gradually over a span of at least one million years. About 60 to 70 thousand years ago, the ancestral Mojave River began incising its modern canyon between Victorville and Barstow. The upper unit of the ancient Mojave River depositional sequence is approximately middle Pleistocene in age, based on terrestrial vertebrate fossils (Cox et al. 2003).

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 [SVP] 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 (see Section II).

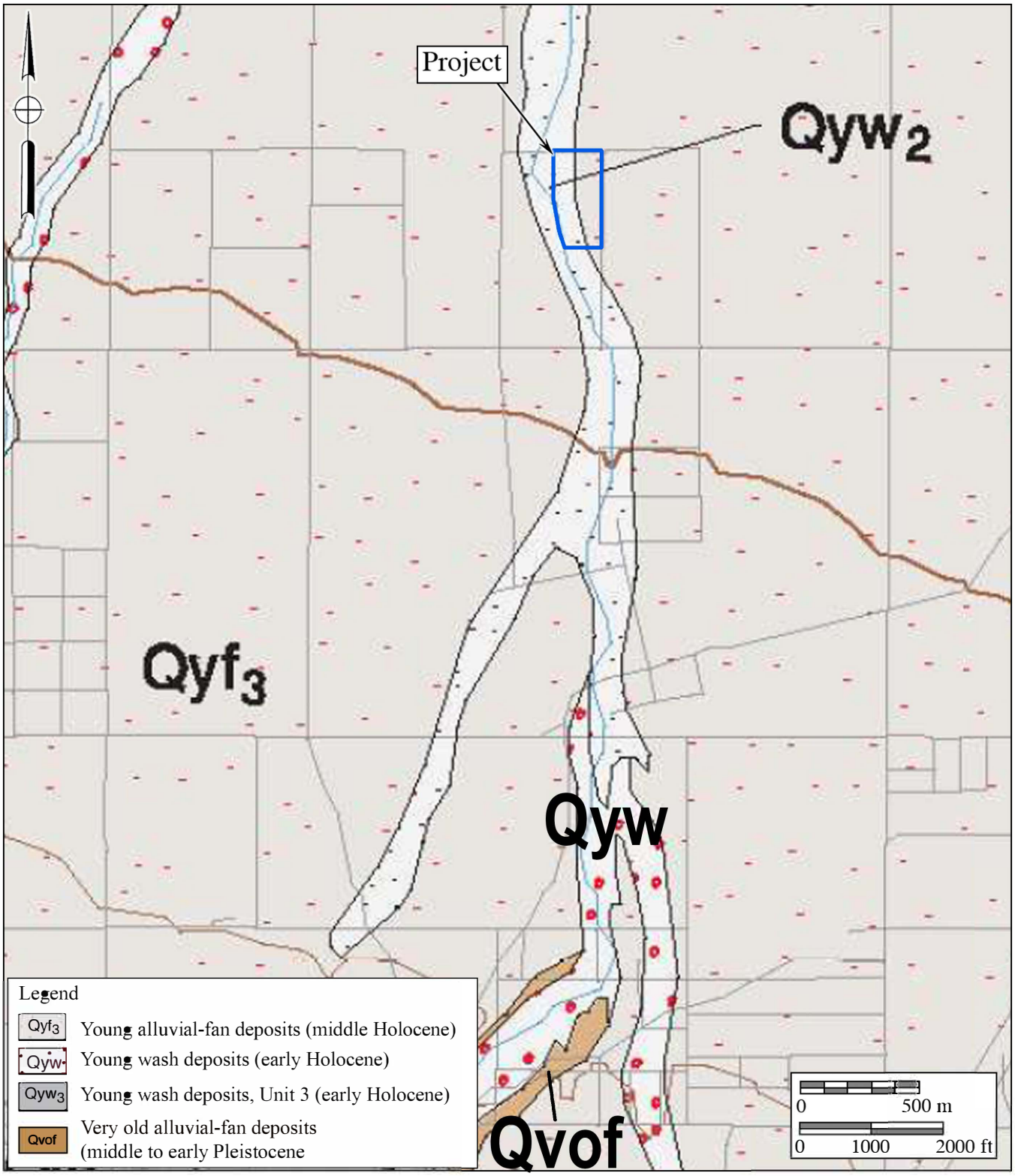

Figure 3

Geologic Map

The Luna and Fremontia (TM 20527) Project

Geology after Morton and Miller (2006)

Fossil Locality Search

A paleontological resource locality search was performed for the project by the Division of Earth Sciences at the San Bernardino County Museum (Kottcamp 2022; Appendix B). The locality search indicated that there are no fossil localities within the project. The closest locality is located approximately 1.5 to 1.6 miles southeast of the project, consisting of Pleistocene rodent teeth and indeterminate mammalian remains. Just over two miles northeast of the project, at Silverado High School, more rodent teeth with large mammal bones, along with land/freshwater snails, were recovered during mitigation monitoring. Farther northeast, multiple localities, mostly of Pleistocene rodent remains, were recovered. Kottcamp (2022) indicated that, while depths of these fossil localities are not precisely known, the deposits that contain the fossils are buried beneath a relatively thin surficial veneer of soil and Holocene deposits.

A review of published and unpublished literature was conducted for potential paleontological resources that are known in the vicinity of the project. The sources reviewed did not indicate the presence of any known fossil localities within the project. However, in the greater Victorville area, there are many recorded Pleistocene vertebrate fossil localities (Jefferson 1986, 1991, 2009; Cox et al. 2003; Romero and Hillburn 2006; City of Victorville 2008b; and several sources by R.E. Reynolds not available for review). Most of the specimens and records recovered from these localities are held by the San Bernardino County Museum (SBCM). All the localities from these sources are derived from the alluvium of the ancestral Mojave River as mapped by Hernandez et al. (2008) and Cox et al. (2003), and are several miles east and north of the project.

Project Survey

On June 2, 2022, BFSA staff, under the supervision of Principal Investigator Todd A. Wirths, conducted an intuitive review of the property to determine if any paleontological resources were visible. The field methodology employed for the project included walking evenly spaced survey transects set approximately 10 meters apart while visually inspecting the ground surface. All potentially sensitive areas where paleontological resources might be located were closely inspected. Ground visibility throughout the property was generally good, with about 75-80 percent of the ground surface visible. At the time of the survey, various impacts to the property were noted. Minor grading was noted along the eastern boundary within the southern shoulder of Fremontia Road, across from the existing residential neighborhood. Multiple unimproved dirt access roads traverse the project parcel. No bedrock outcrops were exposed that might indicate the presence of fossils. No paleontological resources, or evidence of paleontological resources, were observed during the survey.

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. Pleistocene (more than 11,700-year-old) alluvial and alluvial fan deposits in the Inland Empire and Mojave Desert, 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, 2009). These Pleistocene sediments are thus accorded a High paleontological resource sensitivity.

Professional Standards

The 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, 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, the presence of nearby significant fossil localities and potential for buried Pleistocene deposits to underlie thin, surficial Holocene alluvial deposits at the project, the project may be considered to have an undetermined to high potential to yield paleontological resources.

City of Victorville Assessment

Section 5.5.1.2 of the City of Victorville's Draft EIR for the general plan (City of Victorville 2008b) describes the paleontologic resources within the city. Based on Pleistocene vertebrate fossils recovered from sediments deposited by the ancestral Mojave River, areas mapped at such are assigned a "moderate to high sensitivity" for the potential to yield significant paleontological resources (City of Victorville 2008b: Sections 5.5-29, 5.5-30).

In Section 5.5.4, "Project Impacts," of the Draft EIR, mitigation of potentially significant impacts to significant nonrenewable resources is required if identified in program-level paleontological assessments. Implementation Measure 5.1.2.4 "Require[s] paleontologic monitoring of land alteration projects involving excavation into native geologic materials known to have a high sensitivity for the presence of paleontologic resources" (City of Victorville 2008b: Section 5.5-22).

VI. CONCLUSIONS AND RECOMMENDATIONS

Research has confirmed the existence of potentially fossiliferous Pleistocene-aged alluvial fan deposits that are likely present in the shallow subsurface of the project and the known occurrence of significant terrestrial vertebrate fossils at shallow depths from the Pleistocene deposits in the vicinity of the project support that paleontological monitoring be implemented during mass grading and excavation activities in undisturbed alluvial deposits in order to mitigate any adverse impacts (loss or destruction) to potential nonrenewable paleontological resources. Full-time monitoring of undisturbed alluvial deposits at the project is warranted starting at the surface.

A Paleontological Resource Impact Mitigation Program (PRIMP) report that outlines a proposed mitigation monitoring plan at the project is recommended for submittal and approval by the City of Victorville. The PRIMP should be based on the findings stated above. A suggested paleontological PRIMP is below. When implemented, this PRIMP would reduce potential impacts of paleontological resources to a level below significant:

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 the discovery of any fossiliferous materials.
2. Monitoring of mass grading and excavation activities in areas identified as likely to contain paleontological resources shall be performed by a qualified paleontologist or paleontological monitor. Starting at the surface, monitoring will be conducted full-time in areas of grading or excavation in undisturbed alluvial deposits.

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, 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 SVP 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" 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. 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.
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.,* 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 Victorville) will be consulted on the repository/museum to receive the fossil material.
11. A final monitoring and mitigation 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.

June 27, 2022

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

Date

VIII. REFERENCES

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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.

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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.

APPENDIX B

Paleontological Locality Search Report

2024 Orange Tree Lane, Redlands, California 92374 | Phone: 909.798.8608
www.SBCounty.gov

SAN BERNARDINO COUNTY

Museum
Division of Earth Science

Scott Kottkamp
Curator of Earth Science

27 May, 2022

Brian F. Smith & Associates, Inc.
Attn: Todd Wirths
14010 Poway Road, Suite A
Poway, CA 92064

PALEONTOLOGY RECORDS REVIEW for proposed Luna and Fremontia (TM 20527) Project, Victorville, San Bernardino County, California

Dear Mr. Wirths,

The Division of Earth Science of the San Bernardino County Museum (SBCM) has completed a records search for the above-named project in San Bernardino County, California. The proposed project site (Luna and Fremontia, TM 20527) is in the City of Victorville, California as shown on the United States Geological Survey (USGS) 7.5 minute Baldy Mesa, California quadrangle.

Geologic mapping of that region done by Dibblee and Minch (2008a, 2008b) indicates the entire project area is located atop recent alluvial surficial deposits of Holocene age (Qa). These sediments are comprised of unconsolidated mixed sand, silt, and gravel, often covered by soil. These deposits are unlikely to be fossiliferous themselves, but directly overlie ~1.8 million to ~11,000 year old Pleistocene alluvial deposits (Qoa) that are. Where exposed at the surface east of the project site, Qoa is composed mostly of tan to light red weakly indurated sand near the banks of the Mojave River to the northeast (Dibblee and Minch, 2008b). This surficial Qoa grades to brown and gray in a vast plain, west of the river and southeast of the project site, towards Hesperia (Dibblee and Minch, 2008a). Despite these generalities, the composition, color, and depth of Qoa varies vertically and laterally, especially when found in the subsurface. Green-grey silt or clay are common, and the contact between Qa and Qoa in Victorville and Adelanto lies as little as 3 feet below the surface. Such older alluvial deposits have been found to be highly

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fossiliferous in the local area, yielding the remains of mammoth, mastodon, camels, and horses, as well as microfossils including rodents (Reynolds and Springer, 1991). Rancholabrean age fossils can be distinguished from Irvingtonian ones via both biostratigraphy and degree of digenetic alteration – the youngest Rancholabrean specimens are subfossils and degree of diagenetic alteration generally scales with age. In the Adelanto region, Qoa in turn unconformably overlies the Miocene age Tropico Group, which is also fossiliferous (Dames and Moor, Inc., 1995). Below the Tropico Group are igneous and metamorphic units of Jurassic or older age (Dibblee and Minch, 2008b).

For this review, I conducted a search of the Regional Paleontological Locality Inventory (RPLI) at the SBCM. The results of this search indicate that no paleontological resources have been discovered within the proposed project site. Nor have any paleontological resources been found within 1 mile of the project site's perimeter. Many fossil localities, however, are located within 5 miles and the same Qa and Qoa sediments as the project site. An abbreviated summary of these sites is provided below, to convey the highly fossiliferous nature of the area and to give a fuller understanding of the types of fossils present.

The closest fossil localities, SBCM 1.114.209, SBCM 1.114.210, and SBCM 1.114.211 are located approximately 1.5 – 1.6 miles southeast of the project site. Localities occur within Qoa units of grey-brown sand and green silt. No description of the depth at which fossils were found was provided in the records. Taxa present at these localities include *Perognathus* sp., indeterminate Mammalia, and indeterminate Chordata. *Perognathus* sp. is represented by teeth, while the indeterminate taxa are present as permineralized bone fragments.

Localities SBCM 1.114.252 – 1.114.255 were uncovered via paleontological mitigation monitoring during the construction of Silverado High School, 2.2 miles east northeast of the project site. Fossils were uncovered during construction grading and excavation of the school's foundation within Qoa. No description of the sediment or the depth at which fossils were found was provided in the records. Specimens collected from these localities include: unidentified conispiral and planispiral gastropod shells; *Thomomys bottae* LP4/; *Perognathus* sp. metapodials; enamel fragments; and bone fragments of an indeterminate large mammal. The large mammalian bone fragments appear heavily abraded and have a chalky color and texture, but the smaller rodent bones and teeth are well preserved.

SBCM localities 1.115.1 – 1.115.7 and 1.115.11 are arranged in a line running south-southeast, approximately 2.4 miles northeast to 4 miles north-northeast from the project site. These sites were uncovered during the excavation of foundations for transmission line towers. Permineralized mammal bones were discovered at these sites within the same older alluvium (Qoa) underlying the proposed project site. The contact between Qa and Qoa occurs as little as

3 feet below the surface, where Qoa takes the form of mixed green to buff colored fine sand, silt, and clay. The nature of the Qoa varies both laterally and with depth; at SBCM 1.115.11, 9 feet below the surface, Qoa was an orange-grey poorly sorted silt containing subangular gravel and caliche. Because of the excavation's nature, fossils were recovered from the spoils pile of dredged up sediments during augering. Thus, precise depths and most taphonomic data are unknown, though the deepest pit to produce fossils was 14 feet deep at the time (Reynolds and Springer, 1991). Specimens collected from these sites were either subfossils or preserved via permineralization, and include: *Crotalus* sp. vertebrae; Colubridae vertebra; Lacertilia distal tibia; bone fragments and a tarsal phalanx of small Aves; Camelidae tooth fragments (m/x, Mx/); indeterminate Artiodactyla enamel fragments; *Lepus* sp. radius and calcaneum; *Sylvilagus* sp. I1/ fragment; *Thomomys* sp. premaxillae, dentary and horizontal ramus with aveolar wall (i/1, m/x); *Perognathus* sp. R dentary fragment with i/1; *Perognathus* sp. LI1/ and RI1/; *Dipodomys* sp. LI1/, 4 indeterminate cheek teeth (p/x, Px/, m/x, or Mx/), L dentary fragment, and R proximal femur; Rodentia i/1; and a 1st phalanx, ungula phalanx, caudal vertebra, enamel fragments, and three long bone fragments from indeterminate Chordata. Another site associated with the transmission line project, SBCM 1.115.9, turned up indeterminate microfossil bone fragments within Qoa 3.4 miles northwest of the project area (Reynolds and Springer, 1991).

Finally, construction monitoring during subdivision construction within an area 3.5 – 4.5 miles northeast from the proposed project site uncovered 70 paleontological localities situated within Qoa several feet beneath the surface. Localities include SBCM 1.114.56 – 1.114.90, SBCM 1.114.93 – 1.114.97, SBCM 1.114.131 – 1.114.46, SBCM 1.114.160 – 1.114.65, SBCM 1.114.206 – 1.114.208, and SBCM 1.114.290 – 294. Localities occur in Qoa of variable composition, varying from wet dark yellow clay, to red sandy silt, to green silt with clasts of clay and caliche, to grey sand and gravel lenses dispersed within the other units. This Qoa is buried shallowly below a thin veneer of soil and Qa. The fossil assemblage consists of microfossils, bone fragments, and insect burrow traces; mode of preservation is permineralization for bone and casts for burrow traces. Taxa found at these localities include: indeterminate Plantae pollen; insect burrow traces; *Bufo* sp.; indeterminate Anura; *Coleonyx variegatus*; *Cnemidophorus* cf. *tigris*; *Callisaurus draconoides*; *Crotaphytus* sp.; Gambelia sp.; *Phrynosoma* sp.; *Sceloporus* sp.; *Uta stansburiana*; indeterminate Iguanidae; indeterminate Lacertilia; *Crotalus* sp.; indeterminate Colubridae; indeterminate Aves; *Lepus* sp.; *Sylvilagus* sp.; indeterminate Leporidae; *Microtus* sp.; *Neotoma* sp.; indeterminate Cricetidae; *Thomomys bottae*; *Thomomys* sp.; *Dipodomys* sp.; *Perognathus* sp.; *Ammospermophilus leucurus*; cf. *Otospermophilus variegatus*; indeterminate Sciuridae; and various indeterminate bone and enamel fragments.

This records search covers only the paleontological records of the San Bernardino County Museum. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Please do not hesitate to contact us with any further questions that you may have.

Sincerely,

Scott Kottkamp

Scott Kottkamp, Curator of Earth Science
Division of Earth Science
San Bernardino County Museum

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