



October 6, 2023

Ryan Birdseye  
Birdseye Planning Group  
P.O. Box 1956  
Vista, California 92085  
Transmitted via email to ryan@birdseyeplanninggroup.com

**RE: Paleontological Resource Assessment for the Perris Marketplace Project, City of Perris, Riverside County, California**

Dear Ryan Birdseye,

At the request of Birdseye Planning Group, Chronicle Heritage conducted a paleontological resource assessment for the Perris Marketplace Project (Project) in the city of Perris, Riverside County, California. The goal of the assessment was to summarize the results of the museum record search, characterize the paleontological sensitivity of the geologic units present within the Project area, assess the potential for adverse effects to scientifically significant paleontological resources under California Environmental Quality Act (CEQA) guidelines, and provide management recommendations for avoiding or reducing adverse effects to paleontological resources from Project development, as necessary. This paleontological resource assessment included a pedestrian survey of the Project area and a fossil locality record search conducted by the Western Science Center (WSC) in Hemet, California. The record search was supplemented by a review of existing geologic maps and primary literature regarding fossiliferous geologic units within the proposed Project vicinity and region. This technical memorandum, written in accordance with the guidelines set forth by the Society of Vertebrate Paleontology (SVP) (2010), has been prepared to support environmental review under CEQA.

## **Project Location and Description**

The Project area is on a 10.455-acre (ac) vacant parcel (Assessor's Parcel Number 300-260-001). The property is at the southeastern corner of Perris Boulevard and Placentia Avenue in the northern extent of the city of Perris. The Project area is surrounded by commercial and industrial development across Perris Boulevard to the west, and modern residential housing to the east, south, and north (Figure 1). The Project encompasses portions of Section 17, Township 4 South, Range 3 West, San Bernardino Baseline and Meridian, as depicted on the Perris, California (1980) U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle map (Figure 2). The proposed Project involves the development a commercial real estate center and supermarket.



Paleontological Resource Assessment for the Perris Marketplace Project,  
City of Perris, Riverside County, California



Figure 1. Project vicinity map.

Paleontological Resource Assessment for the Perris Marketplace Project,  
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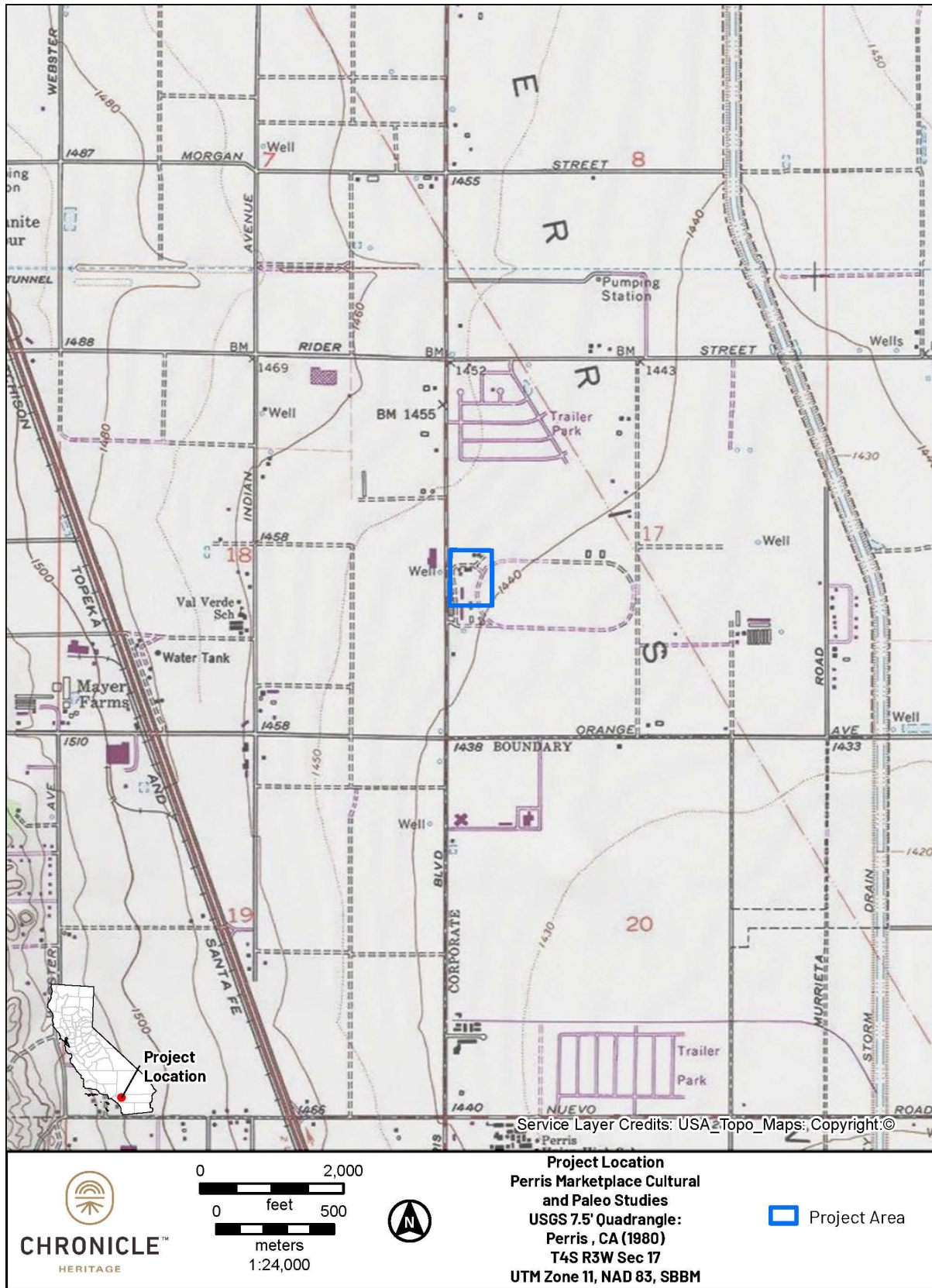


Figure 2. Project location map.

## Regulatory Context

Paleontological resources (i.e., fossils) are considered nonrenewable scientific resources because, once destroyed, they cannot be replaced. As such, paleontological resources are afforded protection under various federal, state, and local laws and regulations. Laws pertinent to this Project are discussed below.

### State Laws and Regulations

#### California Environmental Quality Act

CEQA requires that public agencies and private interests identify the potential environmental consequences of their projects on any object or site of significance to the scientific annals of California (Division I, California Public Resources Code [PRC] Section 5020.1[j]). Appendix G in Section 15023 provides an Environmental Checklist of questions (Section 15023, Appendix G, Section XIV, Part A) that includes the following: "Would the project directly or indirectly destroy a unique paleontological resource or site or unique geological feature?"

#### California Public Resources Code

Section 5097.5 of the PRC states:

No person shall 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, 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. Violation of this section is a misdemeanor. As used in this PRC 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.

Consequently, public agencies are required to comply with PRC 5097.5 for their activities including construction and maintenance as well as for permit actions (e.g., encroachment permits) undertaken by others.

### Local

The City of Perris General Plan Conservation Element (City of Perris, 2008) divides the city into five areas based on their paleontological potential. The Project is in "Area #1", which contains mapped geological units that have been assigned a "high sensitivity," including the older valley alluvial deposits from the Pleistocene Epoch (2.58 million years ago [Ma] to 11,700 years ago). According to Goal IV—Cultural Resources, Policy IV.A, Implementation Measure IV.A.4 of the General Plan, "[i]n Area 1 and Area 2 shown on the Paleontological Sensitivity Map, paleontologic (sic) monitoring of all projects requiring subsurface excavations will be required once any excavation begins" (City of Perris, 2008, p. 47).

# Paleontological Resource Potential

## Resource Significance

CEQA does not define "a unique paleontological resource or site." However, the SVP has provided guidance designed to support state and Federal environmental review. The SVP broadly defines significant paleontological resources as follows:

Fossils and fossiliferous deposits consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. Paleontological resources are considered to be older than recorded human history and/or older than middle Holocene (i.e., older than about 5,000 radiocarbon years)(SVP, 2010:11).

Significant paleontological resources are determined to be fossils or assemblages of fossils that are unique, unusual, rare, diagnostically important, or common but have the potential to provide valuable scientific information for evaluating evolutionary patterns and processes, or which could improve our understanding of paleochronology, paleoecology, paleophylogeography, or depositional histories. New or unique specimens can provide new insights into evolutionary history; however, additional specimens of even well represented lineages can be equally important for studying evolutionary pattern and process, evolutionary rates, and paleophylogeography. Even unidentifiable material can provide useful data for dating geologic units if radiometric dating is possible. As such, common fossils (especially vertebrates) may be scientifically important and therefore considered significant.

## Paleontological Sensitivity

Absent specific agency guidelines, most professional paleontologists in California adhere to the guidelines set forth by the SVP (2010) to determine the course of paleontological mitigation for a given project. These guidelines establish protocols for the assessment of the paleontological resource potential of underlying geologic units and outline measures to mitigate adverse impacts that could result from project development. Using baseline information gathered during a paleontological resource assessment, the paleontological resource potential of the geologic units (or members thereof) underlying a project area can be assigned to one of four categories defined by SVP (2010). Although these standards were written specifically to protect vertebrate paleontological resources, all fields of paleontology have adopted the following guidelines.

### High Potential (Sensitivity)

Rock units from which significant vertebrate or significant invertebrate fossils or significant suites of plant fossils have been recovered have a high potential for containing significant nonrenewable fossiliferous resources. These units include but are not limited to sedimentary formations and some volcanic formations that contain significant nonrenewable fossiliferous resources.

### Low Potential (Sensitivity)

Sedimentary rock units that are potentially fossiliferous but have not yielded fossils in the past or contain common and widespread invertebrate fossils of well-documented and understood taphonomic, phylogenetic species, and habitat ecology have a low potential for containing

significant nonrenewable fossiliferous resources. Reports in the paleontological literature or field surveys by a qualified vertebrate paleontologist may allow a determination that some areas or units have low potential for yielding significant fossils before the start of construction. Generally, these units will be poorly represented by specimens in institutional collections and will not require protection or salvage operations. However, as excavation for construction is underway, it is possible that significant and unanticipated paleontological resources might be encountered and require a change of classification from low to high potential and, thus, require monitoring and mitigation if the resources are found to be significant.

### **Undetermined Potential (Sensitivity)**

Specific areas underlain by sedimentary rock units for which little information is available have undetermined fossiliferous potentials. Field surveys by a qualified vertebrate paleontologist to determine the rock units' potential are required before programs of impact mitigation for such areas can be developed.

### **NO POTENTIAL**

Rock units of metamorphic or igneous origin are commonly classified as having no potential for containing significant paleontological resources.

## **Methods**

To assess whether a particular area has the potential to contain significant fossil resources at the subsurface, it is necessary to review published geologic mapping to determine the geology and stratigraphy of the area. Geologic units are considered "sensitive" for paleontological resources if they are known to contain significant fossils anywhere in their extent. Therefore, a search of pertinent local and regional museum repositories for paleontological localities within and nearby the Project area is necessary to determine whether fossil localities have been previously discovered within a particular rock unit. For this Project, a formal museum record search was conducted at the WSC. Informal record searches were also conducted of the online University of California Museum of Paleontology Collections and San Diego Natural History Museum Collections, the online Paleobiology Database, FAUNMAP, Integrated Digitized Biocollections, and other published and unpublished geological and paleontological literature of the area.

## **Resource Context**

### **Geologic Setting**

The Project area is in the north-central portion of the Peninsular Ranges geomorphic province. A geomorphic province is a region of unique topography and geology distinguished from other regions based on its landforms and diastrophic history. The Peninsular Ranges are a northwest-southeast-oriented complex of blocks that extend 125 miles (mi) from the Transverse Ranges and Los Angeles Basin to the tip of Baja California. The Peninsular Ranges are bounded to the east by the Colorado Desert and range in width from 30 to 100 mi (Norris and Webb, 1976). Locally, Perris is underlain by alluvial sediments from the Pleistocene Epoch (2.6 million years ago to 11,700 years ago) and the Holocene Epoch (11,700 years ago to present), reaching at least 1,000 feet (ft) deep (Woodford et al., 1971). The alluvial sediments are sourced from the surrounding elevated basement rock

composed of igneous and metamorphic rocks predominantly from the Lakeview Mountains Pluton to the north and east (Morton, 1969).

## Site Specific Geology and Paleontology

According to Morton et al. (2003), the Project area is entirely underlain by very old alluvial fan deposits (Qvof) of well-indurated, reddish-brown sand from alluvial fans of the early Pleistocene Epoch (Figure 3). Elsewhere in San Bernardino County, Pleistocene deposits have produced remains of a diverse terrestrial fauna including ground sloth, deer, mammoth, camel, horse, bison, badger, mole, rabbit, gray fox, coyote, snake (Miller, 1971; Jefferson, 1991a, 1991b).

Pleistocene-age alluvial, fluvial, and lacustrine deposits have produced scientifically significant paleontological resources throughout southern California. East of the Project area, in the vicinity of Lakeview, a diverse assemblage of fossil resources included mammoth (*Mammuthus* sp.), sabre-tooth cat (*Smilodon* sp.), extinct horse (*Equus* sp.), bison (*Bison antiquus*), and numerous small mammals, reptiles, invertebrates, and plant remains (Springer et al., 2009). Southeast of the Project area, the largest known open-environment, nonasphaltic, late-Pleistocene fossil assemblage has been documented in the Diamond and Domenigoni Valleys, producing nearly 100,000 identifiable fossils representing over 105 vertebrate, invertebrate, and plant taxa. The vertebrate taxa include reptiles such as frogs, turtles, and lizards; birds such as robins, swallows, jays, ravens, hawks, and ducks; small mammals such as rabbit, squirrel, mice, and weasels; and large mammals such as fox, bear, coyote, deer, bison, mammoths, mastodons, and ground sloths (Springer et al., 2009). The invertebrate and plant taxa include ostracods, snails, termites, slugs, beetles, bivalves, diatoms, pollen, and wood debris (Anderson et al., 2002).

## Records Search Results

The WSC record search did not produce any fossil localities from within the Project area or within 1 mi (Attachment A). Searches of online fossil locality databases and other scientific literature (Miller, 1971; Jefferson, 1991a, 1991b; Graham and Lundelius, 2010; Paleobiology Database, 2023; San Diego Natural History Museum, 2023; University of California Museum of Paleontology, 2023) produced one fossil locality within a 3-mi radius of the Project area. The locality produced fossil specimens of a partial cranium, left and right tusk, molars, sacrum, vertebrae, and ribs of a mastodon (*Mammut pacificus*) approximately 2.5 mi away in Perris at an unspecified depth (Dooley et al., 2019).

## Field Survey

PaleoWest Senior Paleontologist Benjamin Scherzer, M.S., conducted a pedestrian field survey of the Project area on August 3, 2023. The purpose of the field survey was to visually inspect the ground surface for exposed fossils and to evaluate geologic exposures for their potential to contain preserved fossil material at the subsurface. Approximately 50 percent of the central Project area was overgrown by grasses and shrubs. The ground surface along the boundary of the Project area was recently mowed and tilled, which turned up and exposed the soil and underlying sediment (Figure 4). The Project area was inspected by walking 2-meter transects with additional focus paid to areas of exposed sediment. Sediment was a massive, medium brown clay to silt with abundant subangular pebbles. No paleontological resources were observed during the field survey (Figure 5).

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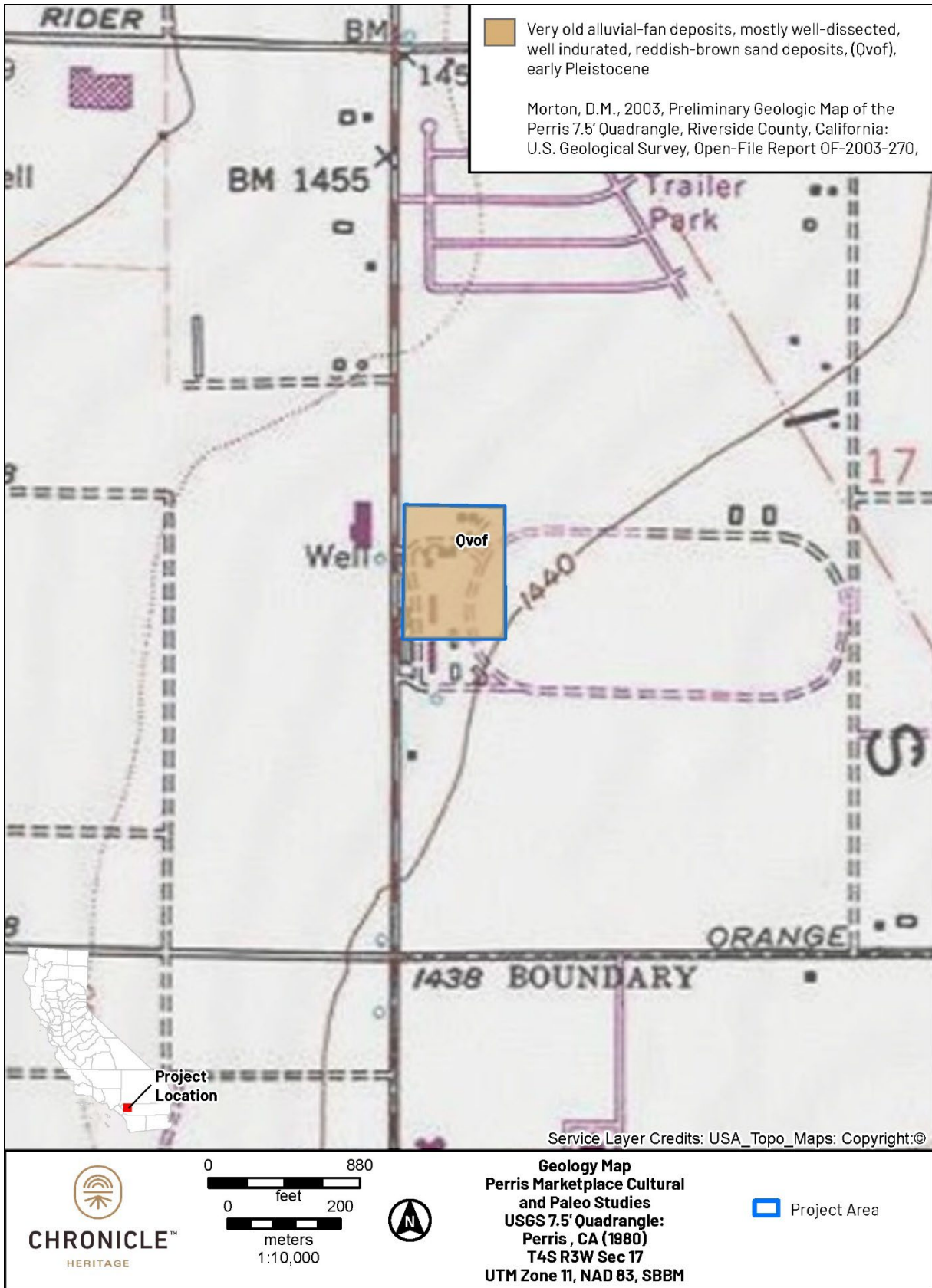


Figure 3. Geologic map of the Project area.



**Figure 4. View of Project area from southwestern corner to the northeast showing signs of recent ground disturbance and human trash.**



**Figure 5. Exposed natural ground surface along eastern edge.**

## Findings

This memorandum uses the SVP system (2010) to assess paleontological sensitivity and the level of effort required to manage potential impacts to significant fossil resources. Using this system, the sensitivity of geologic units was determined by the relative abundance and risk of adverse impacts to vertebrate fossils and significant invertebrates and plants.

Based on the literature review and museum record search results, and in accordance with the SVP (2010) sensitivity scale, the Quaternary very old alluvial fan deposits (Qvof) in the Project area have high paleontological sensitivity because similar deposits have yielded significant fossils in the vicinity. This sensitivity is consistent with the City of Perris General Plan Conservation Element (2008), which assigns a high sensitivity to the Pleistocene deposits in the area. This sensitivity is also consistent with the paleontological sensitivity of the Project area as mapped by the County of Riverside (2015), which shows high sensitivity in the Project area. Because of the presence of fossil localities in the vicinity, Project-related ground disturbance has the potential to impact paleontological resources throughout the Project area.

## Recommendations

In general, the potential for a given project to result in impacts to paleontological resources is directly proportional to the amount of ground disturbance associated with the project; thus, the higher the amount of ground disturbances within geological deposits with a known paleontological sensitivity, the greater the potential for impacts to paleontological resources. Since this Project entails excavation and grading for a commercial center, significant ground disturbances are anticipated. The presence of Pleistocene-age sediment at the surface suggests that ground disturbance may result in significant impacts under CEQA to paleontological resources such as destruction, damage, or loss of scientifically important paleontological resources. Therefore, a qualified paleontologist should be retained to develop and implement the measures recommended below. These measures have been developed in accordance with SVP guidelines; if implemented, these measures will satisfy the requirements of CEQA.

### Worker's Environmental Awareness Program (WEAP)

Prior to the start of the proposed Project activities, all field personnel should receive a worker's environmental awareness training on paleontological resources. The training should provide a description of the laws and ordinances protecting fossil resources, the types of fossil resources that may be encountered in the Project area, the role of the paleontological monitor, the outline steps to follow if a fossil discovery is made, and contact information for the project paleontologist. The training will be developed by the project paleontologist and can be delivered concurrently with other training, including cultural, biological, safety, and others.

## Paleontological Mitigation Monitoring

Prior to the commencement of ground disturbing activities, a professional paleontologist should be retained to prepare and implement a paleontological mitigation plan for the Project. The plan needs describe the monitoring required during ground-disturbing activities. Monitoring should entail the visual inspection of excavated or graded areas and trench sidewalls. If the project paleontologist determines full-time monitoring is no longer warranted based on the geologic conditions at depth, they may recommend that monitoring be reduced or cease entirely.

## Fossil Discoveries

If a paleontological resource is discovered, the monitor will have the authority to temporarily divert the construction equipment around the find until it is assessed for scientific significance and, if appropriate, collected. If the resource is determined to be of scientific significance, the Project Paleontologist shall complete the following:

1. **Salvage of Fossils.** If fossils are discovered, all work in the immediate vicinity should be halted to allow the paleontological monitor and project paleontologist to evaluate the discovery and determine if the fossil may be considered significant. If the fossils are determined to be potentially significant, the project paleontologist (or paleontological monitor) should recover them following standard field procedures for collecting paleontological resources as outlined in the paleontological mitigation plan for the Project. Typically, fossils can be safely salvaged quickly by a single paleontologist and not disrupt construction activity. In some cases, larger fossils (such as complete skeletons or large mammal fossils) require more extensive excavation and longer salvage periods. In this case, the paleontologist should have the authority to temporarily direct, divert or halt construction activity to ensure that the fossils can be removed in a safe and timely manner.
2. **Fossil Preparation and Curation.** The paleontological mitigation plan for the Project will identify the museum that has agreed to accept fossils that may be discovered during Project-related excavations. Upon completion of fieldwork, all significant fossils collected will be prepared in a properly equipped laboratory to a point ready for curation. Preparation may include the removal of excess matrix from fossil materials and stabilizing or repairing specimens. During preparation and inventory, the fossils specimens will be identified to the lowest taxonomic level practical prior to curation at an accredited museum. The fossil specimens must be delivered to the accredited museum or repository no later than 30 days after all laboratory work is completed. The cost of curation will be assessed by the repository and will be the responsibility of the client.

## Final Paleontological Mitigation Report

Upon completion of ground disturbing activity (and curation of fossils if necessary), the project paleontologist should prepare a final mitigation and monitoring report outlining the results of the mitigation and monitoring program. The report should include a discussion of the location, duration, and methods of the monitoring, stratigraphic sections, any recovered fossils, and the scientific significance of those fossils and where fossils were curated.

Thank you for contacting PaleoWest for this Project. If you have any questions, please do not hesitate to contact us.

Sincerely,

A handwritten signature in black ink, appearing to read "Benjamin A. Scherzer". The signature is fluid and cursive, written over a light gray rectangular background.

**Benjamin Scherzer, M.S. | Senior Paleontologist**  
**PALEOWEST**

## References

- Anderson, R.S., Power, M.J., Smith, S.J., Springer, K., and Scott, E., 2002, Paleoeecology of a Middle Wisconsin Deposit from Southern California: *Quaternary Research*, v. 58, p. 310–317, doi:10.1006/qres.2002.2388.
- City of Perris, 2008, General Plan Conservation Element: California, City of Perris Development Services, originally adopted 2005, Sustainable Community Amendment 2008.
- Dooley, A.C., Jr., Scott, E., Green, J., Springer, K.B., Dooley, B.S., and Smith, G.J., 2019, *Mammut pacificus* sp. nov., a newly recognized species of mastodon from the Pleistocene of western North America: *PeerJ*, v. 7, p. e6614, doi:10.7717/peerj.6614.
- Graham, R.W., and Lundelius, E.L., 2010, FAUNMAP II: New Data for North American with a Temporal Extension for the Blancan, Irvingtonian and Early Rancholabrean: Overview, <https://ucmp.berkeley.edu/faunmap/about/index.html> (accessed October 2023).
- Jefferson, G.T., 1991a, A Catalogue of Late Quaternary Vertebrates from California: Part One, Nonmarine Lower Vertebrate and Avian Taxa: Natural History Museum of Los Angeles County Technical Reports 5, 135 p., [http://ibecproject.com/PREDEIR\\_0000133.pdf](http://ibecproject.com/PREDEIR_0000133.pdf).
- Jefferson, G.T., 1991b, A Catalogue of Late Quaternary Vertebrates from California: Part Two, Mammals: Natural History Museum of Los Angeles County Technical Reports 7, 135 p., [http://ibecproject.com/PREDEIR\\_0000133.pdf](http://ibecproject.com/PREDEIR_0000133.pdf).
- Miller, W.E., 1971, Pleistocene Vertebrates of the Los Angeles Basin and Vicinity: (exclusive of Rancho La Brea): Los Angeles, Los Angeles County Museum of Natural History, Bulletin of the Los Angeles County Museum of Natural History, Science No. 10, 136 p.
- Morton, D.M., 1969, The Lakeview Mountains Pluton, Southern California Batholith Part I: Petrology and Structure: *GSA Bulletin*, v. 80, p. 1539–1552, doi:10.1130/0016-7606(1969)80[1539:TLMPSC]2.0.CO;2.
- Morton, D.M., Kennedy, M.P., Bovard, K.R., and Burns, D., 2003, Geologic map and digital database of the Bachelor Mountain 7.5' quadrangle, Riverside County, California: Reston, Virginia, U.S. Geological Survey, Open-File Report 2003–103, doi:10.3133/ofr03103.
- Norris, R.M., and Webb, R.W., 1976, *Geology of California*: New York, Wiley, 378 p.
- Paleobiology Database, 2023, The Paleobiology Database: About the PBDB, <https://paleobiodb.org/#/> (accessed August 2023).
- Riverside County, 2015, Chapter 5: Multipurpose Open Space Element, *in* Riverside County General Plan, Riverside County Planning Department, <https://planning.rctlma.org/sites/g/files/aldnop416/files/migrated/Portals-14-genplan-general-Plan-2017-elements-OCT17-Ch05-MOSE-120815.pdf> (accessed July 2023).
- San Diego Natural History Museum, 2023, Collection Database: Searchable Collection, <https://www.sdnhm.org/science/paleontology/resources/collection-database> (accessed July 2023).

Society of Vertebrate Paleontology [SVP], 2010, Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources: Society of Vertebrate Paleontology, Impact Mitigation Guidelines Revision Committee, [https://vertpaleo.org/wp-content/uploads/2021/01/SVP\\_Impact\\_Mitigation\\_Guidelines.pdf](https://vertpaleo.org/wp-content/uploads/2021/01/SVP_Impact_Mitigation_Guidelines.pdf) (accessed October 2022).

Springer, K.B., Scott, E., Sagebiel, J.C., and Murray, L.K., 2009, The Diamond Valley Lake Local Fauna: Late Pleistocene Vertebrates from Inland Southern California, *in* Albright, L.B. ed., Papers on Geology, Vertebrate Paleontology and Biostratigraphy in Honor of Michael O. Woodburne, Flagstaff, Arizona, Museum of Northern Arizona, Bulletin 65, p. 681.

University of California Museum of Paleontology, 2023, Specimen search: UCMP Specimen Search, <https://ucmpdb.berkeley.edu/> (accessed September 2023).

Woodford, A.O., Shelton, J.S., Doehring, D.O., and Morton, R.K., 1971, Pliocene–Pleistocene History of the Perris Block, Southern California: GSA Bulletin, v. 82, p. 3421–3448, doi:10.1130/0016-7606(1971)82[3421:PHOTPB]2.0.CO;2.

*Attachment A.  
WSC Record Search Results*



September 22<sup>nd</sup>, 2023

Chronicle Heritage  
Benjamin Scherzer  
301 9<sup>th</sup> Street, Suite 114  
Redlands, CA 92374

Dear Mr. Scherzer,

This letter presents the results of a record search conducted for La Strada Extension Project located in the City of Lake Elsinore, Riverside County, CA. The project is located north of Cam Del Norte on Section 33 of Township 5 South, Range 4 West and Sections 3 and 4 of Township 6 South, Range 4 West the *Elsinore, CA* U.S. Geological Survey 7.5' quadrangle.

The geologic units underlying this project are mapped as alluvial units from the Holocene and Pleistocene epochs, along with portions of Mesozoic phyllite and granodiorite (Morton and Weber 2003). Holocene alluvial units are considered to be of high preservation value, but material found is unlikely to be fossil material due to the relatively modern associated dates of the deposits. Pleistocene alluvial units are considered to be highly paleontologically sensitive. The Western Science Center does not have localities within the project area or within a 1 mile radius, but does have localities within similarly mapped units across Southern California, including the Summerly Project located approximately five miles southeast of the project area.

Any fossil specimen from the La Strada Extension Project would be scientifically significant. Excavation activity associated with the development of the project area would impact the paleontologically sensitive Pleistocene alluvial units, and it is the recommendation of the Western Science Center that a paleontological resource mitigation program be put in place to monitor, salvage, and curate any recovered fossils associated with the study area.

If you have any questions, or would like further information, please feel free to contact me at [bstoneburg@westerncentermuseum.org](mailto:bstoneburg@westerncentermuseum.org).

Sincerely,

A handwritten signature in black ink that reads 'Brittney Stoneburg'.

Brittney Elizabeth Stoneburg, MSc  
Collections Manager

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