# APPENDIX D

# GEOLOGY

# PW-B

# Paleontological Resource Assessment

PALEOWEST

T: 909.283.7533
F: 602.254.6280
info@paleowest.com

REDLANDS, CALIFORNIA
301 9th Street, Suite 114
Redlands, CA 92374

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Stephanie Standerfer
Vice President
Albert A. Webb Associates
3788 McCray Street
Riverside, California 92506
Transmitted via email to: stephanie.stnderfer@webbassociates.com

RE: Paleontological Resource Assessment for the Hillwood-Ethanac and Trumble Road Warehouse Project, City of Perris, Riverside County, California

Dear Stephanie Standerfer,

At the request of Albert A. Webb Associates, PaleoWest, LLC (PaleoWest) conducted a paleontological resource assessment for the Hillwood-Ethanac and Trumble Road Warehouse Project (Project) in the city of Perris, Riverside County, California.The goal of the assessment is to identify the geologic units that may be impacted by the development of the Project, determine the paleontological sensitivity of geologic units within the Project area, assess potential for impacts to paleontological resources from the development of the Project, and recommend mitigation measures to avoid or mitigate impacts to scientifically significant paleontological resources, as necessary.

This paleontological resource assessment included a fossil locality records search conducted by the Western Science Center (WSC) in Hemet, California. The records 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, which was written in accordance with the guidelines set forth by the Society of Vertebrate Paleontology (SVP) (2010), has been prepared to support environmental review under the California Environmental Quality Act (CEQA); the City of Perris is the Lead Agency for CEQA compliance.

# PROJECT LOCATION AND DESCRIPTION

The proposed Project involves the development of a warehouse distribution facility and support facilities in the city of Perris, Riverside County, California (Figure 1). The proposed Project would encompass approximately 21 acres of land at the northeast corner of the intersection of Ethanac Road and Trumble Road in the southeast portion of the City of Perris jurisdiction. The Project includes an "offsite area", encompassing approximately 21 acres, that is included in this assessment. As shown in Figure 2, the Project area and offsite area are within Sections 10, Township (T) 5 South (S), Range (R) 3 West (W), San Bernardino Baseline and Meridian, as depicted on the Romoland, California 7.5-minute U.S. Geological Survey (USGS) topographic quadrangle.


Figure 1. Project vicinity map.

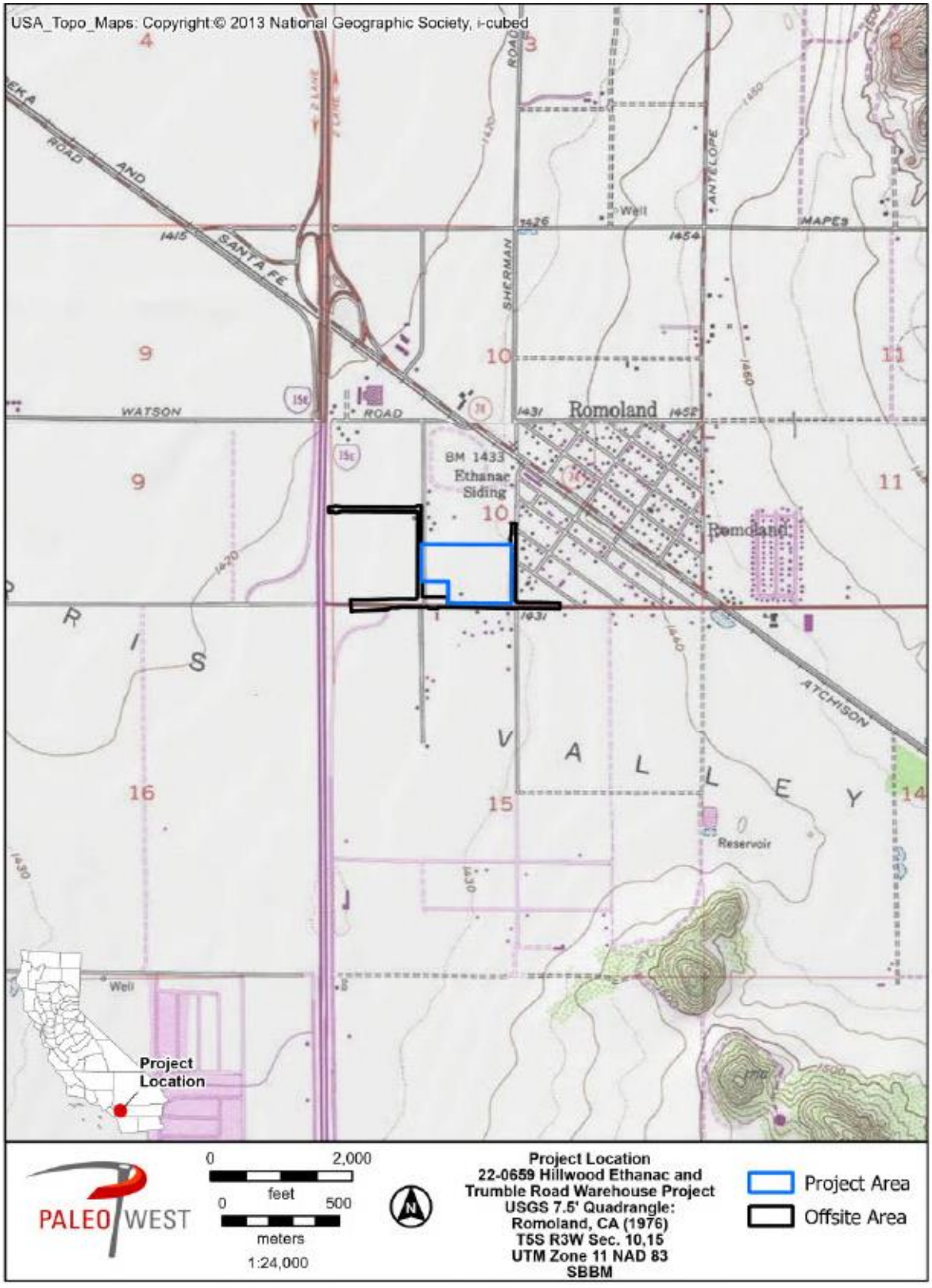


Figure 2. Project location map.

The proposed Project and offsite improvements involve the construction and operation of an approximately 412,348-square-foot (SF) building on the approximate 21-acre Project site. The offsite improvements include street improvements, water and sewer connections, and storm water facilities for the Project. Street improvements will be required along Ethanac Road (at the Ethanac Road/Trumble Road and Ethanac Road/Sherman Road intersections), the intersection of Trumble Road and Illinois Avenue, a segment of Illinois Avenue itself, and along segments of Trumble and Sherman roads north of their intersections with Ethanac Road. Water and sewer connections will connect to the existing lines in Trumble Road or Ethanac Road, in the vicinity of the main Project area. Additionally, construction of offsite infrastructure facilities may be necessary. Storm water facilities will connect to either the Romoland Master Drainage Plan Line A, approximately 0.5 mile (mi) south of the Project site in McLaughlin Avenue, or to a future Line A-21 in Trumble Road, approximately 0.40 mi south of Ethanac Road.

The proposed Project is planned be constructed in a single phase, and the Project site grading will balance on-site. Anticipated depth of disturbance for site development and street widening and utility/drainage improvements, are as follows:

- Onsite: 15 feet
- Sherman Road: 8.8 feet
- Trumble Road: 8.5 feet
- Illinois Avenue: 9.2 feet
- Ethanac Road:  3 feet

# 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 [b]). Appendix G in Section 15023 of the Guidelines for Implementation of CEQA provides an Environmental Checklist of questions (Appendix G, Section VII, Part f) that includes the following: "Would the project directly or indirectly destroy a unique paleontological resource or site or unique geological feature?"

CEQA does not define "a unique paleontological resource or site." However, the SVP has provided guidance specifically designed to support state and federal environmental review. The SVP broadly defines significant paleontological resources as follows (SVP, 2010:11):

> "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)."

Significant paleontological resources are determined to be fossils or assemblages of fossils that are unique, unusual, rare, diagnostically important, or are common but have the potential to provide valuable scientific information for evaluating evolutionary patterns and processes, or 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.

### California Public Resources Code

Section 5097.5 of the Public Resources Code (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 own activities, including construction and maintenance, as well as for permit actions (e.g., encroachment permits) undertaken by others.

## LOCAL

The Comprehensive General Plan Update 2030 (City of Perris, 2005) includes a Conservation Element that identifies and enforces the following local regulation regarding paleontological resources:

> Measure IV.A.4: In Area 1 and Area 2 shown on the Paleontological Sensitivity Map, paleontologic monitoring of all projects requiring subsurface excavations will be required once any excavation begins. In Areas 4 and 5, paleontologic monitoring will be required once subsurface excavations reach five feet in depth, with monitoring levels reduced if appropriate, at the discretion of a certified Project Paleontologist.

Based on the Paleontological Sensitivity Map (Exhibit CN-7) adopted by the City in the Conservation Element (City of Perris, 2005), the Project is within Area 2, which requires paleontological monitoring of all subsurface excavations once excavation begins.

# PALEONTOLOGICAL RESOURCE POTENTIAL

Absent specific agency guidelines, most professional paleontologists in California adhere to the guidelines set forth by 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 unit(s) (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 non-renewable fossiliferous resources. These units include but are not limited to, sedimentary formations and some volcanic formations which contain significant nonrenewable.

## LOW POTENTIAL (SENSITIVITY)

Sedimentary rock units that are potentially fossiliferous but have not yielded fossils in the past or contain common and/or widespread invertebrate fossils of well documented and understood taphonomic, phylogenetic species and habitat ecology. Reports in the paleontological literature or field surveys by a qualified vertebrate paleontologist may allow determination that some areas or units have low potentials for yielding significant fossils prior to 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 gets 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 specifically determine the potentials of the rock units are required before programs of impact mitigation for such areas may 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 a project area is necessary to determine whether fossil localities have been previously discovered within a particular rock unit. For this Project, a formal museum records search was conducted at the Western Science Center (WSC), and informal records searches were conducted of the online University of California Museum of Paleontology Collections (UCMP) and other published and unpublished geological and paleontological literature of the area.

# RESOURCE CONTEXT

## GEOLOGIC SETTING

The Project area is in the geologically complex Peninsular Ranges geomorphic province (Morton and Miller, 2006). A geomorphic province is a region of unique topography and geology that is 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 are 30–100 mi wide (Norris and Webb, 1976). The Project area is on the Perris Block, a relatively stable rectangular structural unit between the Elsinore and San Jacinto fault zones (Morton et al., 2003). Specifically, the Project area is within the Santa Ana Mountains within the Peninsular Ranges. The Santa Ana Mountains are composed of igneous and metasedimentary rocks with an alluvial apron of Quaternary alluvial fan and plain deposits (Morton et al., 2003).

## SITE SPECIFIC GEOLOGY AND PALEONTOLOGY

According to the Geologic Map of the Romoland 7.5-minute Quadrangle (Morton et al., 2003) and the adjacent Geologic Map of the Perris Quadrangle (Dibblee and Minch, 2003), the Project area and offsite areas are underlain by Quaternary old alluvial deposits ($Qof_a$) at the surface (Figure 3). These Quaternary old alluvial deposits were deposited during the late to middle Pleistocene (2.6 million years ago to 11,700 years ago) and are composed of indurated, reddish-brown arkosic sands and gravels that are commonly slightly dissected.

Quaternary sedimentary deposits have yielded scientifically significant paleontological resources throughout the inland valleys of southern California. Middle to late Pleistocene alluvial sediments in the vicinity of the Project area are potentially highly fossiliferous, and many nearby localities within these deposits have preserved a diverse fossil assemblage of Ice Age fauna (McDonald, 2021).

About 10 mi north of the Project area, near Lakeview, a diverse assemblage of fossil resources were recovered and identified, including *Mammuthus sp*. (mammoth), *Smilodon sp.*

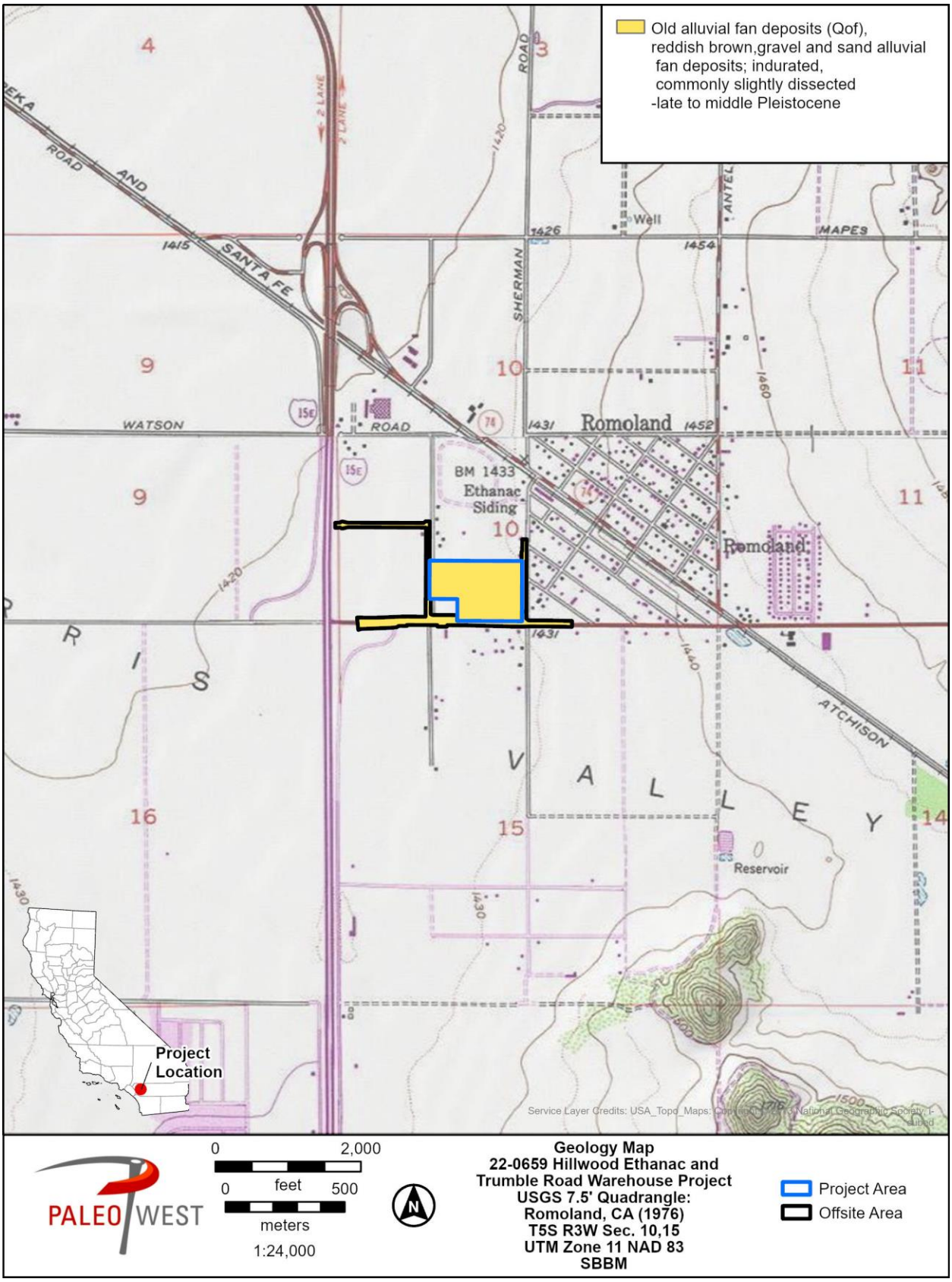


Figure 3. Geologic map.

(sabretoothed cat), *Equus sp.* (extinct horse), *Bison sp.* cf. *B. antiquus* (bison), and numerous small mammals, reptiles, invertebrates, and plants. At Diamond Valley Lake, approximately 10 mi southeast of the Project area, excavation for the reservoir yielded nearly 100,000 fossils representing over 105 vertebrate, invertebrate, and plant taxa (Springer et al., 2009). The vertebrate taxa recovered includes 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).

# RECORDS SEARCH RESULTS

The records search conducted by the Western Science Center (WSC) did not produce any fossil localities from within the Project area or offsite area or from the same geologic unit within 5 mi (Stoneberg, 2022); however, the WSC noted that there have been significant fossils localities mapped in similar Pleistocene localities across Southern California. As such, any fossil discoveries at the Project site would be considered of significant scientific value.

# FINDINGS

This memorandum uses the classification system of SVP (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 on the basis of the relative abundance and risk of adverse impacts to vertebrate fossils and significant invertebrates and plants.

Sedimentary alluvial deposits (Qof) mapped in the Project area and offsite areas are middle to late Pleistocene in age at the surface. According to SVP (2010), these Pleistocene-age sediments would have a high sensitivity for paleontological resources. The presence of nearby significant Pleistocene vertebrate localities suggests sediments in the Project area and offsite area have to yield significant fossil material. Consequently, Project related ground disturbance has the potential to impact paleontological resources.

# RECOMMENDATIONS

In general, the potential for a given project to result in negative 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 negative impacts to paleontological resources.

Since this Project entails excavation for a warehouse complex, new ground disturbances are anticipated up to a depth of 15ft, with proposed road widening along surrounding areas impacting depths up to ~8-9 ft below grade. The presence of Pleistocene deposits at the surface, and potentially at depth in the Project area and offsite area, 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. 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 and local environmental regulations enforced by the City of Perris.

## WORKER'S ENVIRONMENTAL AWARENESS PROGRAM (WEAP)

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

## PALEONTOLOGICAL MITIGATION MONITORING

Prior to the commencement of ground disturbing activities, a professional paleontologist will be retained to prepare and implement a paleontological mitigation plan for the Project. The plan will describe the monitoring required during ground disturbing activities. Monitoring will 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/or 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 mitigation plan prepared 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 fossil(s) can be removed in a safe and timely manner.
2. Fossil Preparation and Curation. The paleontological mitigation plan 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 90 days after all fieldwork 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 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,
PALEOWEST

Matthew Witte, Ph.D. | Associate Paleontologist

# REFERENCES

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